Analysis of Students' Mathematical Misconceptions in Solving Contextual Problems in Fractional Number Material

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Abstract

This study aims to describe the forms of mathematical misconceptions of students in solving contextual problems in fractional number material. The research used a descriptive qualitative approach and was carried out at SD Negeri 1 Gandasoli, Kuningan Regency. The subjects of the study were all students of class V totaling 39 people. Data was obtained through a written test in the form of contextual description questions about fractional numbers that have gone through the validity test stage. Based on the test results, students were classified into three levels of mathematical ability, namely high, medium, and low, then 9 students were selected as sample subjects for in-depth analysis. Data analysis is carried out through the stages of data reduction, data presentation, and conclusion drawn. The results of the study show that students still experience various types of mathematical misconceptions, including misconceptions of translation, signs, calculations, systematic, concepts, and strategies. Misconceptions of translation and signs were found at all levels of mathematical ability, while calculating, systematic, and conceptual misconceptions appeared in students of medium and low ability. Strategic misconceptions are only found in students with low mathematical ability. These findings show that the complexity of misconceptions increases as students' mathematical ability levels decrease, so learning that emphasizes understanding concepts and meaningful problem-solving in fractional number material is needed.

Keywords: Mathematical Misconception, Fractional Numbers, Contextual Problems, Mathematical Ability, Elementary School.

Introduction

Mathematics is one of the subjects that has an important role in the development of students' logical, systematic, and critical thinking skills from the elementary education level. Through mathematics learning, students are expected to be able to understand concepts, reason the relationship between ideas, and apply these concepts in solving problems related to daily life (Safari & Nurhida, 2024). This ability is the basis for the formation of more complex academic competencies at the next level of education. Therefore, the success of mathematics learning is highly dependent on students' mathematical abilities, especially the ability to understand concepts correctly and meaningfully.

Mathematical ability includes various aspects, one of which is the ability to understand mathematical concepts. Concept comprehension is a key foundation in mathematics learning because students who understand concepts well are not only able to remember formulas, but also be able to explain the meaning of a concept, relate it to other concepts, and use it flexibly in various situations (Kairutddin et al., 2025). Several recent studies show that elementary school students' understanding of mathematical concepts is still in the low to medium category. Research conducted by Ammar et al. (2024) dan Mareta & Zulkarnaen (2024) revealed that most students still have difficulty in applying mathematical concepts when faced with non-routine or contextual problems. Similar findings were also presented by Umam & Zulkarnaen (2022) which states that a weak understanding of concepts causes students to tend to memorize procedures without understanding the reasons behind the completion steps used.

One of the mathematics materials in elementary school that requires an in-depth understanding of concepts is fractional numbers. Fractional material is abstract and often poses difficulties for students because it involves representations of parts of the whole, comparisons, as well as calculation operations that are not always concretely visible (Lestiana & Izzati, 2025). These difficulties show that many students have not been able to relate the concept of fractions to the meaning of the situation presented in the problem. This difficulty is increasingly seen when students are faced with contextual problems, namely questions that are associated with real situations. Research results Khairunnisa & Sutarni (2024) and Laia (2023) shows that students often make mistakes in understanding information in fractional story problems, so that the answers given are not in accordance with the supposed concept. This condition indicates that there are conceptual problems that have not been completely resolved in learning.

Conceptual errors that occur repeatedly and consistently are known as misconceptions. Misconception is an incorrect understanding of a mathematical concept, both in defining, classifying, and applying the concept in solving problems. Misconceptions not only arise due to lack of practice, but can also come from students' preconceptions, inappropriate learning methods, or the use of unrepresentative examples (Izzati & Farizi, 2025). Recent research shows that math misconceptions are still widely found in elementary school students, especially in fractional materials (Armelia et al., 2022; Ammar et al., 2024). If these misconceptions are not immediately identified and corrected, then students have the potential to carry these misconceptions to the next material.

Although various studies have examined students' misconceptions of fractional material, most still review errors in general or limited to specific types without systematically attributing them to students' levels of mathematical ability. Studies that analyze variations in the solution of fractional contextual problems based on the mathematical ability category of elementary school students are also limited. Therefore, this study is directed to examine in detail the forms and characteristics of students' mathematical misconceptions in fractional number material reviewed from the level of their mathematical ability, so that it can contribute to the design of fractional learning that is more targeted.

In general, according to Izzati & Farizi (2025) mathematical misconceptions can be classified into several types, as follows:

Table 1. Types of Misconceptions

No.	Types of Misconceptions	Misconception Indicators
1.	Misconceptions of translation	Students make mistakes in converting information from everyday language into mathematical form or vice versa, including mistakes in understanding the meaning of mathematical symbols. Errors are shown by inability to understand problems, errors in interpreting problems, inaccuracy or incompleteness in writing down what is known and asked, and inability to compile mathematical models.
2.	Misconception of signs	Students make mistakes in writing or using mathematical signs and notations, such as operation marks, symbols, or rank notation, both in algebra problems, story problems, or more complex forms of mathematical notation.
3.	Calculation misconceptions	Students make mistakes in mathematical calculations or computations consistently. These errors indicate errors in the understanding of the procedure, such as an error in determining the sequence of operations or the application of a calculation rule.
4.	Systematic misconceptions	Students make mistakes in applying or reasoning concepts more broadly even though the completion steps appear to be structured. Errors are shown through the inability to generalize concepts to different contexts as well as inaccuracies in formulating the solution steps.
5.	Misconceptions of concepts	Students make mistakes in understanding mathematical concepts, which is demonstrated through the inability to express ideas, restate concepts, classify objects, provide precise examples, present concepts in various representations, as well as relate concepts to other contexts or everyday life.
6.	Strategy misconceptions	Students make mistakes in planning problem solving, such as inaccuracies in choosing formulas or methods and mistakes in implementing solution strategies.

Based on this explanation, this study is directed to fill the research gap by analyzing in detail various forms of students' mathematical misconceptions on fractional number material through the solution of contextual problems, as well as examining the characteristics of these misconceptions based on the level of students' mathematical ability. This research is expected to make an empirical contribution in enriching the understanding of the pattern of misconceptions among elementary school students, as well as being the basis for the development of learning strategies and assessments that are more targeted in learning fractional numbers.

Method

This study uses a descriptive qualitative approach with the aim of analyzing the forms of mathematical misconceptions of students in solving contextual problems in fractional number material (Sugiyono, 2022). This approach was chosen because the research does not aim to test hypotheses, but rather to describe in depth the misunderstanding of concepts experienced by students based on the results of their work on the written test. Through a qualitative approach, researchers can reveal the characteristics of misconceptions that appear in real terms according to the learning conditions that take place.

This research was carried out at SDN 1 Gandasoli Regency, Kuningan, with the research subjects of 39 grade V students in the odd semester of the 2025/2026 school year. All students in one class are used as research subjects because they have completed learning fractional number material and have various levels of mathematical ability. The research data was collected through a written test given after the learning was completed, with the presence of the researcher in person to ensure the suitability of the implementation with the research objectives.

The research is carried out through several interrelated stages. The preparation stage includes the preparation of diagnostic test instruments in the form of 12 contextual description questions on fractional number material. The instrument was tested for the validity of its content by two mathematics education lecturers and one experienced elementary school teacher by examining the suitability of material indicators, clarity of context, and accuracy of language. Based on the validator's input, the instrument was revised and tested on grade V students in other elementary schools who had similar characteristics.

The data from the trial results were analyzed to assess the quality of the question items through validity, reliability, differentiation, and difficulty tests. The results of the analysis showed that 11 questions met the eligibility criteria and were declared valid and reliable for use in the research. The instrument is then used at the stage of implementing the test.

Student answers are used as the main data source to identify mathematical errors and misconceptions in solving contextual problems. Data analysis is carried out qualitatively through the stages of data reduction, data presentation, and conclusion drawn. Answers containing misconceptions were selected, coded based on the type of misconception that had been determined, and grouped according to students' mathematical ability level (high, medium, and low), which were determined using mean criteria and standard deviations (M ± SD) only as the basis for analytical grouping. The results of the analysis are presented narratively to describe patterns and variations of misconceptions, then interpreted to obtain complete conclusions. The validity of the data is maintained through repeated analysis and consistency checks between the students' answers and the misconceptions categories used (Saleh, 2017).

Results and Discussion

The results of the study show that grade V students still experience various forms of mathematical misconceptions in solving contextual problems in fractional number material. These misconceptions can be seen in the way students understand the information in the problem, determine the solution strategy, and perform fraction counting operations. These findings indicate that some students have not fully understood the concept of fractions in their entirety even though they have completed learning on the material.

Furthermore, the results of the analysis show that the misconceptions experienced by students are not uniform. Misconceptions come in different types and varying degrees of complexity. Therefore, the analysis of the results of the research was carried out by grouping misconceptions based on the type of misconception that emerged and reviewed from the level of students' mathematical ability, namely high, medium, and low mathematical ability. This grouping aims to obtain a deeper picture of the characteristics of student misconceptions at each level of mathematical ability.

As a first step before analyzing these forms of misconception, a classification of students' mathematical ability level is carried out. This classification aims to provide a preliminary overview of the characteristics of the research subject. The determination of the level of students' mathematical ability refers to the classification criteria put forward by the Arikunto (2013). Based on these criteria, students are grouped into three categories, namely high, medium, and low math skills.

Table 2. Classification Criteria for Mathematical Ability Level

Mathematical Ability Level	**Value Criteria**
Height	x ≥ M+SD
Medium	M – SD < x > M + SD
Low	x ≤ M - SD

The classification criteria for the level of mathematical ability presented in Table 2 are then used as a reference in grouping students based on the test results obtained. Each student's grade point average is compared to the average score and standard deviation to determine his or her category of mathematical ability. The results of the grouping resulted in the distribution of the number of students at each level of mathematical ability presented in Table 3.

Table 3. Number of Students Based on Mathematical Ability Level

Mathematical Ability Level	**Number of Students**
Height	8
Medium	24
Low	7
Quantity	**39**

Based on Table 3, it can be seen that grade V students are divided into three categories of math proficiency levels, namely high, medium, and low, with varying numbers. This classification is used as an initial framework for analysis to qualitatively describe variations in students' mathematical misconceptions in solving contextual problems in fractional number material.

As a step to deepen the analysis, from the 39 students who took the test, the researcher selected 9 students as sample subjects consisting of 3 students with high mathematical ability, 3 students with medium mathematical ability, and 3 students with low mathematical ability. The selection of these sample subjects is intended to represent the characteristics of misconceptions at each level of students' mathematical ability. In the presentation of the research results, only the answers of students who best represent the pattern of misconceptions in each ability group are displayed.

Furthermore, the results of the study are presented in more detail based on the types of mathematical misconceptions found. The following description describes each type of misconception in stages by reviewing the characteristics of students' errors at high, medium, and low levels of mathematical ability.

a. Translation Misconceptions

The misconception of translation in this study is shown by the students' mistakes in converting information from everyday language into mathematical form or vice versa. These errors include inaccuracy in understanding the meaning of the problem, errors in interpreting the problem, incompleteness in writing down the information known and asked, and the inability to compile a mathematical model that is in accordance with the context of the problem. Translation misconceptions are found across the entire level of mathematical ability of students with different characteristics.

Figure 1. Misconceptions of Translation of Students with High Mathematical Ability

In students with high mathematical ability, students make mistakes in compiling mathematical models that represent contextual problems. Students tend to immediately perform fractional operations without writing down or clearly explaining the information known and asked. Although the calculation procedure used is correct, the mathematical model that is compiled does not fully reflect the relationship between the information in the problem, thus indicating a misconception at the stage of translating the context into mathematical forms.

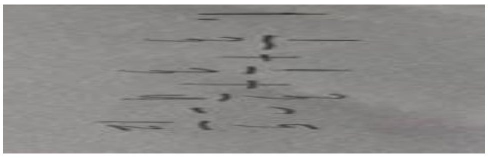

Figure 2. Misconceptions of Translation of Students with Moderate Mathematical Ability

In students with moderate mathematical ability, translation misconceptions appear in inaccuracies in interpreting the information of the problem. Students write down mathematical operations directly without showing a complete understanding of the context of the problem. The information known and asked is not stated completely, so the mathematical model used is not fully in accordance with the purpose of the given question.

Figure 3. Misconceptions of Translation of Students with Low Mathematical Ability

Meanwhile, in students with low mathematical ability, translation misconceptions appeared more dominantly. Students have difficulty understanding the content of the problem as a whole and are unable to convert contextual problems into proper mathematical forms. Errors can be seen in the inability to determine important information, understand the meaning of mathematical symbols, and compile mathematical models, so that the answers given are not in accordance with the problem in question.

In general, translation misconceptions are experienced by students at all levels of mathematical ability. The difference lies in the complexity of the mistakes made, where high-ability students tend to make mistakes at the modeling stage, moderately capable students at the information interpretation stage, and low-ability students at the overall understanding of the problem.

b. Misconception of Signs

The misconception of signs in this study is shown by students' mistakes in writing and using mathematical signs and notation, especially operation signs and comparison marks in the context of fractional problems. These errors appear in the inaccuracy in determining symbols that correspond to the purpose of the problem, inconsistencies in the use of signs, and the inability to affirm the meaning of mathematical symbols used in solving contextual problems.

Figure 4. Misconception of the Sign of Students with High Mathematical Ability

In students with high mathematical ability, sign misconceptions are still found even though students are able to complete most of the calculation steps correctly. Based on the results of the answers, students can determine the procedure for comparing fractions by equalizing the denominator, but experience mistakes in writing or explicitly affirming the comparison marks. Students tend to jump to conclusions verbally without writing down appropriate math comparison symbols, such as ">" or "<." This shows that students understand the concept of fractional comparison, but are not yet fully consistent in representing it using the right mathematical notation according to the demands of the question.

Figure 5. Misconception of Marks of Students with Moderate Mathematical Ability

In students with moderate mathematical ability, the misconception of signs appeared more pronounced than in the high-ability group. Students are able to compare fractions by equalizing denominators, but there is an error in the use of comparison marks that are contrary to the calculation results. In some answers, students write down comparison marks that do not match the value of the fraction that has been calculated, so that the final conclusion becomes wrong. This condition shows that students have difficulty in associating the results of numerical calculations with mathematical symbols that represent the relationship between fractional values.

Figure 6. Misconception of Marks of Students with Low Mathematical Ability

Meanwhile, in students with low mathematical ability, sign misconceptions appear dominantly and fundamentally. Students do not show the use of comparison marks or clear mathematical operation marks in answering questions. The answers given are more of a short statement without supporting mathematical symbols. This shows that students are not able to understand the meaning of mathematical symbols in the context of fraction comparison, and are not able to translate the results of thought into the correct form of mathematical notation.

In general, the misconception of signs at all three levels of mathematical ability exhibits different characteristics. High-ability students tend to experience misconceptions in the aspect of completeness and firmness in the use of symbols, students with moderate abilities experience errors in the accuracy of the use of signs, while low-ability students show inability to use mathematical signs and notation conceptually and procedurally. These findings indicate that the understanding of symbols and mathematical notation needs special attention in fractional learning, not only on the computational aspect but also on the correct mathematical representation.

c. Misconceptions of Calculation

The calculation misconception in this study is shown by students' mistakes in performing mathematical calculations or computations consistently. These errors reflect errors in understanding calculation procedures and rules, such as errors in determining the sequence of operations as well as errors in applying fractional number operating rules. Based on the results of the analysis, calculus misconceptions were not found in students with high mathematical ability, but appeared in students with medium and low mathematical ability.

Figure 1. Misconceptions of Calculating Students with Moderate Mathematical Ability

In students with moderate mathematical ability, calculation misconceptions are seen in errors in performing fraction summing operations. Students have determined the appropriate form of operation, but make mistakes in the calculation process, especially at the stage of equalizing denominators and adding numerators. This error indicates that the student has not fully understood the procedure for the fraction counting operation correctly, so the calculation results obtained are not in accordance with the answer key.

Figure 2. Misconceptions of Calculating Students with Low Mathematical Ability

Meanwhile, in students with low mathematical ability, calculation misconceptions appear more fundamentally. Students make mistakes in applying the rules of fraction counting operations, especially on multiplication operations. Errors are seen in the way students multiply numerators and denominators that do not correspond to the correct rules, as well as inaccuracies in determining the order of operations. This shows that students do not have an adequate procedural understanding of fractional number calculation operations, thus having an impact on the inaccuracy of the final results obtained by students in solving problems.

In general, calculation misconceptions in this study were only found in students with medium and low mathematical ability. Moderately capable students tend to make mistakes at the computational stage despite having chosen the right operation, while low-skilled students make more fundamental errors in understanding and applying the rules of computational operations. These findings suggest that strengthening procedural understanding in fractional operations is still needed, particularly for students with moderate and low mathematical ability.

d. Systematic Misconceptions

The systematic misconception in this study is shown by the students' mistakes in reasoning and applying mathematical concepts more broadly, even though the written completion steps appear to be structured. The error can be seen in the inaccuracy of students in compiling the sequence of solution steps and the inability to generalize the concept of fractional numbers into the context of different problems. Based on the results of the analysis, systematic misconceptions were not found in students with high mathematical ability, but appeared in students with medium and low mathematical ability.

Figure 3. Systematic Misconceptions of Students with Moderate Mathematical Ability

In students with moderate mathematical ability, systematic misconceptions appear in the preparation of solution steps that are not in accordance with the supposed structure of the concept. Students have written down several steps of fraction calculation in order, but the sequence and relationship between the steps does not reflect a complete understanding of the concept. Errors are seen when students combine multiple fractional operations without considering the relationships between those operations, so that the final result obtained does not match the answer key. This shows that students are not able to generalize the concept of fractions appropriately into the context of the given questions.

Figure 4. Systematic Misconceptions of Students with Low Mathematical Ability

Meanwhile, in students with low mathematical ability, systematic misconceptions appear to be more dominant. Students write down answers briefly without indicating a clear and logical sequence of completion steps. This error shows that students have not been able to formulate systematic solution steps and do not understand how the concept of fractions is applied gradually to solve problems. The inability of students to generalize concepts can also be seen from answers that are not directly related to the problem asked.

In general, systematic misconceptions in this study were only found in students with medium and low mathematical ability. Moderately capable students tend to make mistakes in connecting and sequencing the completion steps, while low-achieving students show more fundamental difficulties in devising the completion steps and applying concepts thoroughly. These findings show the need for an emphasis on learning that emphasizes the interconnectedness between steps and the ability to generalize concepts, especially in fractional number material.

e. Misconceptions of Concepts

The misconception of concepts in this study is shown by students' mistakes in understanding and mastering mathematical concepts in depth. This error can be seen through the inability of students to restate concepts correctly, relate concepts to the context of the problem, and present the concept of fractions appropriately in various forms of representation. Based on the results of the analysis, concept misconceptions were not found in students with high mathematical ability, but appeared in students with medium and low mathematical ability.

Figure 5. Misconception of the Concept of Students with Moderate Mathematical Ability

In students with moderate mathematical ability, misconceptions of concepts appear in students' inaccuracies in understanding the meaning of fractional operations in the context of the problem. Students do fractional subtraction and summing without understanding the actual concept of fractional value. This can be seen from the results of subtraction (5/6) − (1/10) which was concluded to be 4/4, as well as the subsequent addition that resulted in a final conclusion that was not in accordance with the context of the problem. This mistake shows that the student has not been able to correctly restate the concept of fractional operations and has not understood that the results of fractional operations must still represent logical values in the context of the problem.

Figure 6. Misconception of the Concept of Students with Low Mathematical Ability

In students with low mathematical ability, conceptual misconceptions arise in the form of an inability to relate the concept of fractions to the meaning of the context of daily life. Students immediately concluded that the mother had a 6/16 without showing an understanding of the relationship between the surgery performed and the meaning of the calculation results. This answer shows that students are not able to classify and represent the concept of fractions appropriately, and do not understand the relationship between the concept of fractions and the contextual situation presented in the question. This condition reflects that the understanding of the concept of fractions of students is still procedural and not yet contextually meaningful.

In general, misconceptions of concepts in this study were only found in students with medium and low mathematical ability. Moderately capable students tend to make mistakes in understanding the meaning of the concept of fractional operations, while low-ability students show more fundamental difficulties in relating the concept of fractions to the context of the problem. This condition shows that the understanding of the concept of fractions of students at both levels of ability has not been fully formed. Therefore, fractional learning needs to be directed not only at the calculation procedure, but also at strengthening the meaning of concepts through various representations and contexts that are close to students' daily lives.

f. Misconceptions of Strategy

The misconception of strategy in this study is shown by students' mistakes in planning problem solving, especially in choosing formulas, methods, or solution steps that are in accordance with the given problem. This error can be seen when students are unable to determine the right initial strategy, so that the completion steps taken are not relevant to the purpose of the problem. Based on the results of the analysis, strategy misconceptions were not found in students with high and moderate mathematical ability, but appeared in students with low mathematical ability. This condition shows that the ability to plan problem-solving is still a major weakness in students with low mathematical ability.

Figure 7. Misconception of Strategies of Students with Low Mathematical Ability

In students with low mathematical ability, misconceptions of strategy appear in inaccuracies in choosing and applying solution methods. Students write the final result in the form of 8/8 fractions without showing the completion steps that are in accordance with the context of the problem. In addition, students perform fraction multiplication operations by mixing irrelevant numbers, such as writing (5/8) × (5/8) which is then equated with (1/6) × (1/8) and produces illogical values. This error indicates that students do not have a clear strategic plan in solving the problem and simply combine operations at random without considering the mathematical significance of each step.

In addition, students also concluded the answer in the form of a contextual statement "Beni picks apples 13/7" which is not in accordance with the context of the problem and is not supported by the proper settlement process. This shows that students are not able to relate mathematical solving strategies to the context of the story problem, and are unable to choose the appropriate method to obtain meaningful answers.

In general, strategy misconceptions in this study were only found in students with low mathematical ability. Students have difficulty in planning the completion steps from the initial stage, so the strategies used are not appropriate and produce answers that are not in accordance with the problem. These findings show the need for learning that emphasizes the ability to plan problem-solving strategies systematically, especially for students with low mathematical ability. This condition confirms that weaknesses in the planning stage have a direct impact on the quality of problem solving produced by students.

Based on the description of the six types of misconceptions that have been explained, then a recapitulation of the types of mathematical misconceptions of students based on the level of mathematical ability, namely high, medium, and low ability. This recapitulation aims to provide an overview of the pattern of occurrence and distribution of misconceptions in each ability group, which is compiled based on the results of analysis on each type of misconception that has been described earlier.

Table 1. Recapitulation of Misconceptions Based on Mathematical Ability Level

Types of Misconceptions	High Capability	Medium Ability	Low Capability
Translation Misconceptions	✓	✓	✓
Misconception of Signs	✓	✓	✓
Misconceptions of Calculation	–	✓	✓
Systematic Misconceptions	–	✓	✓
Misconceptions of Concepts	–	✓	✓
Misconceptions of Strategy	–	–	✓

Description:

✓ = found, – = not found

Based on the table, it can be seen that misconception of translation and misconception of signs are found at all levels of mathematical ability of students. Calculus, systematic, and conceptual misconceptions were found in students with moderate and low mathematical ability, while strategy misconceptions were only found in students with low mathematical ability. This recapitulation shows that there are variations in the types of misconceptions experienced by students at each level of mathematical ability, and shows the difference in the complexity of misconceptions along with the level of students' mathematical ability.

The pattern of findings of this study provides an initial overview of the characteristics of students' mathematical misconceptions and becomes a basis for further interpreting the thinking process that underlies the emergence of these misconceptions. The results of the study show that grade V students of SD Negeri 1 Gandasoli Kuningan Regency are still experiencing various forms of mathematical misconceptions in solving contextual problems in fractional number material. The misconceptions that arise are not limited to calculation errors, but also include errors in translating problem information, the use of mathematical signs and notation, understanding concepts, systematically formulating solution steps, and determining problem-solving strategies. This indicates that students' difficulties in fractional material are complex and involve the relationship between conceptual and procedural understanding, not just weak numeracy skills.

When viewed from a cognitive perspective, these misconceptions can be attributed to the lack of a complete mental representation of the concept of fractions. Students tend to process the problem information partially, thus failing to relate the context of the problem to relevant mathematical concepts. This condition is seen in the misconception of translation and signs, which indicates that students experience obstacles in the early stages of problem processing, i.e. understanding the meaning of information and converting it into a proper mathematical model. This obstacle can be influenced by learning habits that emphasize procedural exercises more than the meaning of the context of the problem.

The difference in misconception patterns based on the level of mathematical ability also provides an important pedagogical explanation. Students with relatively high mathematical ability have mastered the calculation procedure, but are still prone to making mistakes in interpreting context and using mathematical notation appropriately. This shows that mastery of procedures is not always in line with understanding meaning. Meanwhile, in moderately gifted students, more diverse misconceptions reflect a consistent understanding of concepts and procedures that have not been integrated. In students with low math ability, the emergence of misconceptions of almost all types, including misconceptions of strategies, suggests that students have difficulty from the early stages of solving planning to determining solution steps, which can be attributed to the limitations of knowledge schemas and low experience in contextual problem-solving.

This finding is in line with previous research that stated that fractional material is one of the topics that is prone to causing misconceptions in elementary school students (Khairunnisa & Sutarni, 2024; Laia, 2023; Ammar et al., 2024; Armelia et al., 2022). However, the study expands on existing understanding by showing that the type and complexity of misconceptions are closely related to students' level of mathematical ability. In particular, misconceptions of strategies found only in low-ability students indicate that the ability to plan problem-solving is a high-level skill that requires more structured learning support.

The pedagogical implications of these findings confirm the importance of mathematics learning that focuses not only on the final outcome, but also on the students' thinking process in understanding problems and formulating solutions. Teachers need to pay more attention to the stage of understanding the context, building mathematical models, and training students in choosing and implementing problem-solving strategies consciously. Learning fractional numbers that integrates various representations, discussion of concept meanings, and contextual situations that are close to students' experiences is expected to help reduce misconceptions and support the formation of more meaningful mathematical understanding (Widyatma & Ramadhani, 2024).

Conclusion and Suggestion

This study shows that grade V students of SD Negeri 1 Gandasoli still experience various forms of mathematical misconceptions in solving contextual problems in fractional number material. Misconceptions found include misconceptions of translation, signs, calculations, systematic, concepts, and strategies, with different characteristics at each level of students' mathematical ability.

The results of the study also showed that translation and sign misconceptions were found at all levels of students' mathematical ability, while calculating, systematic, and conceptual misconceptions appeared in students with moderate and low mathematical ability. Strategy misconceptions are only found in students with low mathematical ability, which suggests that the complexity of misconceptions tends to increase as students' mathematical ability levels decline.

Based on these findings, further research is recommended to involve a broader range of subjects and use additional data collection techniques, such as interviews, to get a deeper picture of students' thinking processes. In addition, further research can be directed at the development of learning or interventions specifically aimed at minimizing mathematical misconceptions in fractional number material.

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