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Analysis Of Students' Ability In Solving Story Problems On FPB And KPK Material In Grade VII-B Of SMP Negeri 2 Sentani In The 2025/2026 Academic Year

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Abstract
This research is descriptive research using qualitative approaches. The purpose of this study is to analyze and describe students' ability in solving word problems on the topics of Greatest Common Divisor (GCD) and Least Common Multiple (LCM) in relation to their learning outcomes (high, medium, and low) in Class VII-B of SMP Negeri 2 Sentani in the Academic Year 2025/2026. The students' problem-solving abilities were examined through the following stages: (1) the ability to understand and identify the information in the problem; (2) the ability to plan the solution; (3) the ability to perform calculations correctly; and (4) the ability to answer the question or write the conclusion. The subjects of this study consisted of three students representing different levels of learning achievement: high, medium, and low. The data were collected through written tests and interviews. The written test consisted of three essay questions. The results of the study revealed that: (1) students with high learning outcomes were able to solve word problems effectively at all stages, including understanding and identifying information, planning solutions, performing calculations, and drawing accurate conclusions; (2) students with medium learning outcomes were able to understand the problem and plan solutions but made mistakes in the calculation and conclusion stages due to incorrect application of the LCM concept; and (3) Students with low learning outcomes were only able to understand the information in the problem but were unable to continue to the planning, calculation, or conclusion stages correctly due to the error in choosing the correct solution strategy, which was the confusion betweenthe use of the GCD (Greatest Common Divisor) and LCM (Least Common Multiple) concepts.

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1. INTRODUCTION

Education is a crucial aspect of human life, serving as a foundation for developing quality human resources. Through education, individuals are expected to develop their full potential and be prepared to face future challenges (Rosi, 2015). Education encompasses all the influences schools provide on students, optimally honing their abilities and increasing their awareness of relationships and social responsibility (Ahdar, 2017).

Mathematics is a subject that plays a significant role in education. It is a fundamental discipline that extends beyond numerical activities and plays a crucial role in developing students' logical, systematic, and critical thinking skills. In Indonesia, mathematics is taught to students from elementary school through university as part of the curriculum. In the Indonesian

curriculum, one of the basic skills required for students is the ability to solve mathematical problems related to real-life contexts, commonly referred to as word problems.

Math word problems are a type of problem that describes problems relevant to everyday situations that need to be translated into mathematical language for solution (Amien et al., 2022). Math word problems require not only mathematical skills but also skills in understanding context, analyzing information, selecting appropriate strategies, and presenting logical solutions. In solving math word problems, students are not only required to find the final answer but also must go through a series of steps that require good understanding and analytical skills. This process includes understanding the problem context, identifying relevant information, planning a solution strategy, carrying out calculations, and drawing appropriate conclusions. The process of solving word problems is structured so that students must be able to think more critically when solving math word problems. Students' ability to solve word problems can be seen from how they solve the problems given.

The following are the stages in solving story problems according to Haji (Raharjo et al., 2009), understanding the information in the problem, formulating what actually needs to be searched for, compiling the solution in the form of appropriate symbols or formulas, performing calculations based on the model that has been created, and reconnecting the results obtained with the initial context to ensure the solution obtained correctly answers the problem. In line with the steps of Al Jupri & Drijvers (2016), students are able to solve story problems through 4 steps of solution, namely, understanding the problem (context), changing it into a mathematical model, solving it symbolically, and reinterpreting the results into the initial context. Based on this view, this study uses the following steps to solve story problems:

1) Understand and determine the information in the question by writing down what is known and what is asked.
2) Carry out problem-solving planning,
3) Perform calculations to solve problems correctly.
4) Answer questions by drawing correct conclusions.

Students can solve word problems by identifying the known and unknown elements in the problem and then converting them into mathematical sentences. However, many students are still unable to solve these problems or often experience difficulties in the process (Nugroho et al., 2023). Based on the 2022 PISA survey, Indonesia's mathematical literacy is relatively low, with an average score of 366 points. This figure is far below the OECD average (472 points), placing Indonesia in 70th place out of 81 participating countries, or 12th from the bottom (OECD, 2023). This indicates a significant challenge in students' mathematics, especially in understanding and solving mathematical problems related to everyday life contexts.

Students' ability to solve word problems is an important measure of comprehensive mathematical understanding. This is especially crucial in the FPB and LCM (Level of Functions) and LPK (Level of Functions) topics at the junior high school level, where students are required to apply these concepts to real-world problems. This challenge becomes even more relevant as various studies show that word problems remain a major source of difficulty for many students in learning mathematics.

Several previous studies have shown that students have difficulty in planning steps to solve story problems, especially the main difficulty of students lies in the stage of understanding the problem, namely 87.57% with a high category, and developing a solution strategy, namely 73.91% with a high category (Yulianti et al., 2023). This is in line with Hasanudin & Habsyi (2023). This study shows that students often have difficulty finding the main idea/key sentence in story problems and converting it into a mathematical model, especially when they have to recognize important information from the problem so that the resulting answer is less accurate.

In the context of FPB and LCM story problems, Kase et al. (2021) emphasized that students not only struggle to understand the meaning of story problems but also often confuse the concepts of FPB and LCM when choosing a solution strategy. Therefore, the aforementioned studies confirm that mastery of FPB and LCM story problems is not only related to calculation skills but

also closely related to critical thinking skills, mathematical representation, and reading comprehension skills.

At SMP Negeri 2 Sentani, student learning outcomes in the FPB and LCM material, especially in story problems, are still low. One of the school's mathematics teachers said some students have difficulty distinguishing when to use FPB and LCM, performing calculations, and remembering concepts. To design relevant and appropriate learning for students, a strong understanding of solving story problems is a skill needed by students. Therefore, this study aims to analyze the ability of grade VII-B students in solving story problems in the FPB and LCM material based on learning outcomes.

Based on the description above, the research that will be studied is "Analysis of Students' Ability in Solving Story Problems on FPB and KPK Material in Class VII-B of SMP Negeri 2 Sentani in the 2024/2025 Academic Year".

2. METHOD

This research is a descriptive study with a qualitative approach that aims to analyze and describe students' abilities in solving story problems on the FPB and KPK material based on learning outcomes. This research was conducted at SMP Negeri 2 Sentani in August 2025. The research subjects consisted of three grade VII-B students representing each category of learning outcomes. The learning outcomes used in dividing these categories were taken from the recapitulation of test scores given by the subject teachers, and then three subjects were selected from each category.

Table 1. Student Ability Categories

Student Grades	Category
$0 - 50$	Low
$51 - 70$	Currently
$71 - 100$	High

Table 2. Research Subjects

Name Initials	Mark	Category
AA	100	High
AI	68	Currently
OR	40	Low

These three subjects have been selected based on the technique of purpose sampling, which is selected from each group category (high, medium, low), which will be used as the subject, and also based on input and considerations from the teacher.

This study used two instruments: the primary instrument and the supporting instrument. The primary instrument was the researcher herself, while the supporting instruments were a test and an interview guide. The test instrument consisted of three expert-validated questions related to the FPB and KPK topics, along with the interview guide. Data validity was tested using time triangulation, comparing the results of the first interview with the results of the second interview, conducted at two different times or in different situations, to ensure data consistency.

The data collection techniques used in this study were tests and interviews. The tests consisted of three descriptive questions, structured according to the curriculum used and taught. Interviews were conducted with subjects after completing the tests. This was to obtain truly valid data regarding students' ability to solve story problems related to the FPB and LPK materials. The test and interview data were then analyzed. The data analysis used in this study includes data reduction, data presentation, and conclusion.

3. RESULTS AND DISCUSSION

1. Student Abilities with High Learning Outcomes (St)

Students with high learning outcomes were able to solve all three problems correctly, as were the steps taken by students with high learning outcomes in solving them accurately and correctly. Students with high learning outcomes were able to identify the information known and asked in the problem, develop a solution strategy, and perform calculations correctly, until drawing the right conclusion. This indicates that the subject has full mastery of the four steps in solving story problems, namely understanding and determining the problem information, planning the problem solution, performing calculations, and answering the problem questions (conclusions). This finding is in line with the research of Lestari et al. (2025), which states that students with high learning outcomes can solve story problems well and correctly by mastering all the steps in solving the problem. This ability is also strengthened by the results of the study by Lisnani & Inharjanto (2023) that students with high learning outcomes can master the steps in solving problems, starting from understanding the context of the story problem, determining important information, developing the right solution strategy, and carrying out the correct calculation steps. Thus, the first problem formulation is answered: students with high learning outcomes have the ability in solving FPB and KPK story problems.

2. Ability of Students with Average Learning Outcomes (Ss)

Students with average learning outcomes can only solve story problems regarding FPB well and correctly, namely, question number one and question number three in section A regarding FPB. Question number one is a question regarding FPB, which is still relatively easy.

Meanwhile, the questions that could not be solved were questions number two and number three in part B. In question number two regarding the LCM, students with moderate learning outcomes only had the ability in the first and second steps, namely understanding and determining the information in the question, and planning to solve the problem. Students were unable to complete the third step of solving the story problem, namely calculating the concept of LCM. In question number three in part B regarding the same thing, LCM, students with high learning outcomes did not answer question number three in part B correctly. From these questions, students' inability occurred because the concept of LCM used by students, namely taking all factors in numbers and factors with the smallest exponents, was not correct, so the final answer was wrong. These results illustrate that students in the moderate category tend to stop at the stage of carrying out calculations, so that they are not optimal in the stage of answering questions. This is in accordance with the research of Nuryana & Rosyana (2019), which found that students' ability in carrying out calculations/work was very low, namely 58.85%, resulting in wrong final answers. Thus, the second problem formulation was answered: students with moderate learning outcomes were able to understand the problem but were still weak in calculating and evaluating the results of the answers, especially in understanding the concept of LCM.

3. Ability of Students with Low Learning Outcomes (Sr)

Students with low learning outcomes can only state what is known and what is being asked. However, in subsequent steps, they are unable to plan appropriate problem-solving strategies, perform calculations correctly, and answer questions (conclusions) based on the results.

In questions 1 and 2, students were able to determine the problem information, but made mistakes in choosing a problem-solving strategy, namely in using the concepts of LCM and GCF. As a result, the calculation process was inaccurate, and the final answer was wrong. A similar thing also happened in question number 3, students were able to understand and determine the problem information correctly, but were unable to apply the correct strategy because they again made mistakes in using the concepts of GCF and LCM. This resulted in the calculation process being inaccurate, and the students were unable to draw appropriate conclusions. This indicates that Sr has not been able to distinguish when to use GCF and when

to use LCM. This finding is in line with Mufidah, Akina & Fauziah (2021), who emphasized that students often make mistakes in distinguishing between problems solved using LCM and GCF. This is also supported by research by Murpratiwi et al. (2016), who stated that many students have difficulty distinguishing between the types of GCF and LCM problems, which results in fatal errors in applying the concept, namely using the GCF concept for problems that should be LCM, or vice versa. Thus, the third problem formulation is answered: students with low learning outcomes experience difficulties from the stage of planning a solution strategy, so they fail to achieve the correct calculation and solution steps.

4. CONCLUSION

Based on the results of the analysis and discussion in this study, the following conclusions can be drawn:

1) Student's ability with high learning outcomes

   In solving story problems, students with high learning outcomes are students with full ability in solving story problems, this can be seen from the ability in the first step, namely the ability to understand and determine the information in the problem, the second step, namely the ability to plan the solution of the problem, the third step, namely the ability to do calculations, and the fourth step, namely the ability to answer the question questions (conclusions) correctly in each question regarding FPB and KPK.

2) The ability of students with moderate learning outcomes

   In solving story problems regarding GCF and LCM, students with average learning outcomes only have two abilities in the first and second steps: the ability to understand and determine problem information and the ability to plan problem solving. Students with average learning outcomes are unable to perform the third step, which is to perform calculations correctly. This occurs because in the third step, students with average learning outcomes are unable to use the LCM concept correctly, resulting in incorrect calculations for their final answers. This results in students with average learning outcomes also being unable to perform the fourth step, which is to answer the question (conclusion) correctly.

3) The ability of students with high and low learning outcomes

   In solving story problems regarding FPB and KPK, students with low learning outcomes only have one ability in the first step, namely, understanding and determining the information in the problem. This is seen in the second, third, and fourth steps that cannot be completed. This shows that students with low learning outcomes are unable to analyze the three problem items well, so the students' skills in applying them are not good enough. This is seen from the error in applying the FPB and KPK solution strategies, so that they cannot solve the problem correctly.

5. SUGGESTION

Based on the results of the research that has been carried out, the researcher provides several suggestions as follows:

1) For math teachers

   Mathematics teachers should be able to design mathematics teaching and learning activities that can help improve students' abilities in solving story problems on FPB and KPK materials.

2) For students

   Students are expected to study more diligently and frequently practice story questions related to FPB and KPK.

3) For other researchers

   The results of this study are expected to be used as a reference source for future research.

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7. BIBLIOGRAPHY

Ahdar. (2017). Ilmu Pendidikan. *Pujangga*, *1*(1), 1–9. Parepare: IAIN Parepare Nusantara Press

Amien, N. K., Arsyad, N., Ma'rup, M. et al. (2022). Kemampuan Berpikir Kreatif Dalam Menyelesaikan Soal Cerita Operasi Hitung Bentuk Aljabar Siswa Smp. *Pedagogy: Jurnal Pendidikan Matematika*, *7*(1), 109–119. (https://doi.org/10.30605/pedagogy.v7i1.1805).

Hasanudin, L. & Habsyi, R. (2023). Analisis Kesulitan Siswa Dalam Menyelesaikan Soal – Soal Cerita Pada Materi Himpunan Siswa Kelas VII SMP Negeri 9 Kota Ternate. *Jurnal Ilmiah Matematika*, *4*(1), 35–53

Jupri, A. & Drijvers, P. (2016). Student difficulties in mathematizing word problems in Algebra. *Eurasia Journal of Mathematics, Science and Technology Education*, *12*(9), 2481–2502. (https://doi.org/10.12973/eurasia.2016.1299a).

Kase, F., Rike, N., Senid, P. et al. (2021). *Analisis Kesulitan Siswa Berdasarkan Kemampuan Pemahaman Matematis Dalam Menyelesaikan Soal Cerita Pada Materi FPB dan KPK*. *Jurnal Matematika dan Pendidikan Matematika*. *2*(2), 29–42.

Lestari, N. A., Trisiana, A. & Rizkasari, E. (2025). Analisis Kemampuan Pemecahan Masalah dalam Menyelesaikan Soal Matematika Materi Kpk dan Fpb Berbasis Hots Peserta Didik Kelas IV Sd Negeri Ngandul 1 Tahun Pelajaran 2024/2025. Jurnal Ilmiah Pendidikan Dasar. Vol 10

Lisnani, & Inharjanto, A. (2023). Mosharafa: Jurnal Pendidikan Matematika Students' Problem-Solving Ability Using Picture Story Contexts. *Mosharafa: Jurnal Pendidikan Matematika*, *12*(1), 101–112. (http://journal.institutpendidikan.ac.id/index.php/mosharafa).

Mufidah, Akina, Fauziah, S. et al. (2021). Kesalahan Siswa dalam Menyelesaikan Soal Cerita FPB Dan KPK di Sekolah Dasar. *Jurnal Kreatif Online (JKO)*, *9*(2), 111–118. (http://jurnal.fkip.untad.ac.id/index.php/jko).

Murpratiwi, G., Nusantara, T., & Sa'dijah, C. (2016). Analisis Kesalahan Siswa SMP dalam Menyelesaikan Soal Cerita KPK Dan FPB. Malang: Universitas Negeri Malang

Nugroho, S., Siswanto, J. et al. (2023). Analisis Kemampuan Menyelesaikan Soal Cerita. *Pendas : Jurnal Ilmiah Pendidikan Dasar*, *08*(01), 5065.

Nuryana, D. & Rosyana, T. (2019). Analisis Kesalahan Siswa Smk Dalam Menyelesaikan Soal Pemecahan Masalah Matematik Pada Materi Program Linear. *Jurnal Cendekia: Jurnal*

Pendidikan Matematika, *3*(1), 11–20

Raharjo, M., Ekawati, E. et al. (2009). *Pembelajaran Soal Cerita di SD*. 74

Rosi, D. (2015). Teori dan Aplikasi Manajemen Pendidikan. In H. Mansyur (Ed.), *Angewandte Chemie International Edition, 6(11), 951–952.* (I, Vol. 1, Issue April). Aceh: Yayasan Penerbit Muhammad Zaini

Yulianti, D., Siroj, R. A. et al. (2023). Kesalahan Siswa SD Dalam Menyelesaikan Soal Pemecahan Masalah Materi FPB Dan KPK Berdasarkan Tahapan Polya. *Differential: Journal on Mathematics Education*, *1*(2), 171–184. (https://doi.org/10.32502/differential.v1i2.111).