

ANALYSIS OF STUDENT ERRORS IN SOLVING HIGHER ORDER THINKING SKILLS PROBLEMS IN BUILDING MATERIALS

Feri Istikhomah¹, Supriyono², Rintis Rizkia Pangestika³

Primary Teacher Education, Faculty of Teacher Training and Education, Purworejo

Muhammadiyah University, Purworejo

¹karikaferry@gmail.com, ²supriyonojati@gmail.com, ³rintisrizkia@gmail.com

Citation: Istikhomah, F., Supriyono, S., & Pangestika, R. (2022). ANALYSIS OF STUDENT ERRORS IN SOLVING HIGHER ORDER THINKING SKILLS PROBLEMS IN BUILDING MATERIALS. Indonesian Journal of Elementary Teachers Education, 3(2). doi:<https://doi.org/10.25134/ijete.v3i2.6951>

Recived: 2022-03-20

Accepted: 2022-04-29

Published: 2022-11-30

ABSTRACT

This study aims to 1) describe the types of errors made by students in solving HOTS type story questions on building material, 2) describe the factors that cause students to make mistakes in solving HOTS type story questions on building materials. The type of research used in this research is descriptive qualitative using qualitative methods. The research subjects were the fifth grade students of Pringgowijayan Elementary School in the academic year 2021/2022 with a total of 12 students. The data collection technique in this study used the test method, interview method and documentation. The data obtained are in the form of student answer sheets and interview transcripts. The data collection instrument that became the main instrument was the researcher himself who was supported by a HOTS test, a voice recorder, and an outline interview guide. Data analysis techniques in this study are data reduction, data presentation, and drawing conclusions. The results showed 5 types of errors made by students in solving HOTS questions, namely 1) reading errors in the form of student answers that were not in accordance with the intent of the question and incorrectly used information on the questions; 2) misunderstanding in the form of mistaking the information in the question and not knowing what is known and asked from the question; 3) transformation errors in the form of incorrectly converting information into mathematical models, not writing down the steps for solving problems, and incorrectly determining arithmetic operations; 4) process skill error in the form of an error in the calculation process and not writing down the steps for solving the problem; 5) notation error in the form of an error in writing the conclusion of the answer.

Keywords: error, causative factor, HOTS

INTRODUCTION

Errors in solving math word problems are problems that are often encountered in classroom learning. Students are required to think critically and creatively. Critical and creative thinking skills are categorized as higher order thinking skills. Question categories that encourage students to think at a higher level are called HOTS (higher order thinking skills) type questions. Students can be faced with problems that are outlined in the form of word problems. Problem solving is a process that is given to students to learn actively and think to examine, search, and find information/facts for themselves to solve in terms of concepts, principles, theories, or conclusions (Aryani & Maulida, 2019).

Saraswati & Agustika (2020) define HOTS as an ability that involves critical and creative thinking to solve a problem. Someone with high-level thinking skills must be able to analyze, connect, parse and interpret problems to obtain solutions or new ideas. HOTS-based learning according to Wibawa & Agustina (2019) is learning that can grow, develop, and awaken students' reasoning abilities and high-level thinking.

Based on interviews conducted with the fifth grade teacher at Pringgowijayan Public Elementary School, it was found that in learning mathematics there were still many

students who made mistakes in solving HOTS questions, especially story problems. Some children have difficulty understanding the questions to determine the arithmetic operations that should be used. In addition, in this class there are still children who are still confused about the concept of arithmetic operations, such as addition, subtraction, multiplication or division. However, the mistakes that often occur are students who are not careful in solving problems.

Things like the above were also found by several researchers. It is not uncommon to find several student errors in solving HOTS type math word problems. The results of a study of students' work in solving HOTS type math word problems by Hidayati et al., (2020) showed that almost all subjects made mistakes in each question at different cognitive levels. Students make a lot of mistakes at the encoding stage (writing the final answer) with type C6 (create), which is the highest level thinking process. Research by Sa'adah et al. (2019) found 4 types of errors out of 5 types of errors based on the Newman's Error Analysis (NEA) category. The types of errors made were in the form of understanding errors, transformation errors, errors in process skills and answer writing errors.

Learning mathematics is one of the steps to improve human resources (Mahmudah, 2018). According to the 2013 Ministry of Education and Culture, the goals of learning mathematics are to improve intellectual abilities, especially students' high-level abilities. This is in accordance with the implementation of the 2013 Curriculum in Indonesia which among others aims to develop higher order thinking skills. Critical and creative thinking is needed in solving problems, because the rapid development of knowledge and technology has resulted in more complex challenges and problems that humans will face in the 21st century (Driana & Ernawati, 2019).

Based on the description of the background above, the researcher is interested in conducting research with the title "Error Analysis in Solving Higher Order Thinking Skills Type Story Problems Material Building Class V Class Students of SD Negeri Pringgowijayan". The hope of this study is that the teacher can find out the factors of student errors in solving HOTS questions, so that it can be an evaluation for better mathematics learning in the future. Through error analysis in solving HOTS questions, it can be used as an evaluation for teachers to improve learning methods in class, so as to improve the quality of education in Indonesia to produce human resources who have the ability to think critically and creatively as one of the determinants of knowledge and technology development.

Errors are deviations from something that is true (Sulistio et al., 2019). Errors can also be said to be a discrepancy with the actual thing. Mistakes made by students can be intentional or unintentional. So, student mistakes in solving math problems are discrepancies in solving problems. Errors made by students can occur due to many things. One effort to find out about this is to analyze student mistakes in solving word problems based on their types and causes.

Error analysis is an investigation of errors or deviations from the truth of a matter or predetermined procedures that are systematic, consistent, or incidental to find out errors or mistakes (Setiawan et al., 2018). Furthermore, Yunia & Zanthi (2020) define error analysis as an attempt to investigate an irregularity event to find out what caused an irregularity event to occur. So, it can be concluded that error analysis means an investigation into the error of an event or object and the cause of the error. Analysis of student errors in solving HOTS questions is interpreted as analyzing errors from the results of student answers.

Learning mathematics is one of the steps to improve human resources (Mahmudah, 2018). According to the 2013 Ministry of Education and Culture, the goals of learning mathematics are to improve intellectual abilities, especially students' high-level abilities. This is in accordance with the implementation of the 2013 Curriculum in Indonesia which among others aims to develop higher order thinking skills. Critical and creative thinking is needed in

solving problems, because the rapid development of knowledge and technology has resulted in more complex challenges and problems that humans will face in the 21st century (Driana & Ernawati, 2019).

Based on the description of the background above, the researcher is interested in conducting research with the title "Error Analysis in Solving Higher Order Thinking Skills Type Story Problems Material Building Class V Class Students of SD Negeri Pringgowijayan". The hope of this study is that the teacher can find out the factors of student errors in solving HOTS questions, so that it can be an evaluation for better mathematics learning in the future. Through error analysis in solving HOTS questions, it can be used as an evaluation for teachers to improve learning methods in class, so as to improve the quality of education in Indonesia to produce human resources who have the ability to think critically and creatively as one of the determinants of knowledge and technology development.

Errors are deviations from something that is true (Sulistio et al., 2019). Errors can also be said to be a discrepancy with the actual thing. Mistakes made by students can be intentional or unintentional. So, student mistakes in solving math problems are discrepancies in solving problems. Errors made by students can occur due to many things. One effort to find out about this is to analyze student mistakes in solving word problems based on their types and causes.

Error analysis is an investigation of errors or deviations from the truth of a matter or predetermined procedures that are systematic, consistent, or incidental to find out errors or mistakes (Setiawan et al., 2018). Furthermore, Yunia & Zanthi (2020) define error analysis as an attempt to investigate an irregularity event to find out what caused an irregularity event to occur. So, it can be concluded that error analysis means an investigation into the error of an event or object and the cause of the error. Analysis of student errors in solving HOTS questions is interpreted as analyzing errors from the results of student answers.

RESEARCH AND METHODS

This research uses descriptive qualitative method. Amir & Sartika (2017) explained that qualitative research is research conducted by someone to interpret natural phenomena in depth on data in the field. The descriptive qualitative method used aims to find out in depth regarding student errors in solving HOTS type questions on geometric material. Through descriptive qualitative research methods, it can reveal what mistakes students made in solving problems and the factors that underlie students making these mistakes. This research was conducted at Pringgowijayan Public Elementary School, Kutoarjo District, Purworejo Regency, Central Java.

The data source used in this study is the primary data source, namely fifth grade students at SD Negeri Pringgowijayan, totaling 21 students and teachers who teach mathematics. The technique for taking subjects for interviews uses the snowball technique, which is a technique where the data sources are initially small and then enlarged (Sugiyono, 2020: 134). This is done because the few data sources have not been able to fulfill the required data. So that the number of data sources will increase.

Data collection techniques in this study are using test methods, interviews and documentation. The HOTS type questions that will be given to students are shown in the form of story questions which consist of 3 questions. The step for compiling the questions begins with making a grid that is adjusted to the spatial material indicators linked to the indicators of higher order thinking skills or HOTS. Before being given to students the questions were validated by material experts. Interviews in this study were conducted on students and mathematics teachers. After the answer sheets were analyzed, the researcher conducted interviews with students and teachers. The interviews conducted aimed to find out

the factors that caused students to make mistakes in solving HOTS type questions on geometric materials. Documentation in this study was carried out to complement the data studied. Researchers use cellphones as a documentation tool in document collection to corroborate research data. The documentation carried out was in the form of recordings during interviews with students as research subjects, photos of students' work in solving test questions, and photos during the interview.

The data analysis technique in this study used the following steps: 1) data reduction by correcting the results of students' answers in solving test questions, then grouping types of errors based on Newman's error indicators. 2) the presentation of data is done to show the data obtained to make it easier to describe the types of errors and analyze the factors that cause errors made by students. The data obtained is presented using tables, brief descriptions and interview results in the form of interview transcripts. 3) drawing conclusions, namely the last stage in data analysis techniques. The conclusion in this study aims to answer the formulation of the problem and research questions, namely to conclude the types of mistakes made by students in solving HOTS questions on geometric materials and the factors that cause students to make these mistakes.

RESULTS AND DISCUSSION

The results of the research on fifth grade students of Pringgowijayan Public Elementary School, obtained the types of student errors in solving HOTS type word problems on geometrical material as follows.

- a. Error reading (reading error): the student's answer does not match the intent of the question, the student uses the wrong information in the problem such as an error in writing the radius of the tube.
- b. Error understanding (comprehension error): students do not know what is actually being asked in the problem, students are wrong in capturing information on the problem.
- c. Transformation error: students do not convert information into mathematical models, students do not write down steps to solve problems, students make mistakes in determining arithmetic operations.
- d. Error process skills (process skills error): students experience errors in the calculation process, students do not write down the steps to solve the problem.
- e. Error notation/final answer (encoding error): students do not write the conclusion of the answer, students write the conclusion of the wrong answer, student writes the conclusion of the answer but the final result is not correct.

Reading Error

Reading is the initial activity before students start solving problems, especially story problems. Reading questions must be done seriously. In line with Nurfalalah et al. (2021) the ability to read good questions is a great start for being able to solve math problems because it will affect the next step of the solving process. However, this is different from some of the fifth grade students at Pringgowijayan Public Elementary School when solving HOTS questions, some students answered not according to the intent of the questions.

Diketahui: $r = 3 \text{ cm}$
 $t = 4 \text{ cm}$
 $= 9 \times 4 \times 3 \times 4$
 $= 216$
Jadi luas BDPisi adalah 216 cm^2

Figure 1. Reading Error

As in the picture above, students write down the volume of the cylinder, even though what is contained in the problem is a rectangular shape. This also happened in the study by Hanipa et al. (2019) who found student errors in understanding the meaning of the questions. Students do not understand the intent of the questions so that the student's answers are not in accordance with what is asked in the questions. Students assume that the answer has been completed when in fact it is not finished.

Students must have the ability to read in depth when solving HOTS type questions. Unlike the fifth grade students at Pringgowijayan Public Elementary School, during the interview the students were asked to read the questions before the researcher interviewed them regarding the student answer sheets. Students are able to read the questions quickly and fluently, but on the answer sheet students are wrong in writing the elements of a cylinder and cone shape.

3. Diketahui : terigu	Jawab: $V \text{ kerucut} = \frac{1}{3} \times \pi \times r^2 \times t$
: wadah kerucut dan tabung	$= \frac{22}{7} \times \frac{22}{7} \times \frac{1}{4} \times 12 \times \frac{1}{4}$
: jari-jari = 12 cm	$= 2.112 \text{ cm}^3$
: tinggi = 14 cm	$V \text{ tabung} = \pi \times r^2 \times t$
	$= \frac{22}{7} \times 12 \times 12 \times 14$
	$= 6.336 \text{ cm}^3$
	Jadi, kerung goni cepat terisi
	peruh adalah kerucut
	Karena, wadah kerucut lebih kecil dari wadah tabung.

Figure 2. Reading Error

This happened in question number 3, as the student's answer above, which is described in the question about the shape of a cylinder with a diameter of 12 cm, but almost all students wrote down the radius of 12 cm. Even though these two elements have different meanings, so students do not continue the problem solving process correctly. This was also found by research by Fatahillah et al. (2017) which shows the percentage of students' reading errors is 23.12%, which includes errors in reading units, currency symbols, nominal money, and words in the questions.

The causes of student errors at the reading stage include because students do not focus when reading questions. The number of students who are too active can make the classroom atmosphere less conducive when research activities take place. Efforts that have been made by researchers to keep monitoring and conditioning the class are still less influential. So that a busy class distracts the focus of some students who end up not focusing when reading the questions. This makes students unable to capture the information about the questions correctly.

Comprehension Error

After students read the questions, students need to understand the question and then students find solutions to problems. Almost all students were able to read the questions quickly and fluently, but when the researcher asked what was asked of the questions, some students answered they did not know. This means that many students experience misunderstandings. As found by Rambe & Afri (2020) students with low problem solving

skills are only able to write down what is known from the problem, but have not been able to write down what is being asked. This also happened in Mahmudah's research (2018) where misunderstandings occurred because students wrote down what was known and asked exactly the same as what was written in the questions but they did not continue with the other processes.

Many students make mistakes in understanding seen from the way students write answers. As happened in problem number 2 with the keyword "pouring oil from one container to another", but many students have difficulty understanding this sentence. Student errors in capturing information about questions can be seen from students' answers when writing known and asked. Some students wrote down what was known and were asked incompletely, and there were students who did not write down what was known and were asked at all.

2. Diketahui = Kubus $\sqrt{\text{Kubus}} = 5 \times 5 \times 5 = 12 \times 12 \times 12 \text{ cm}$
Ditanya = Apakah minyak tepat mengisi kubus tersebut?
Dijawab = $\sqrt{\text{Kubus}} = \cancel{5} \times 5 \times 5$ ya tepat
 $= 12 \times 12 \times 12$
 $= 144 \text{ cm}$

Figure 3. Comprehension Error

Based on the student's answers above, the student did not write down what was known completely. So that students do not continue the steps of solving the problem correctly. This was also found in Himmi & Husna's research (2020) which showed that when writing down information from the problem it was seen that students only rewrote what was in the problem so that to continue solving the students experienced confusion and were unable to solve the problem. The causes of students making mistakes at the understanding stage include because students are not used to writing down what is known and asked, and students do not read the questions seriously.

Transformation Error

The transformation stage is the core stage of solving math problems, where the information in the problem in the form of sentence structure is converted into a mathematical model. At this stage students think about determining the right formula to answer the questions. In line with Aryani & Maulida (2019) that writing, constructing, creating ideas, concepts, formulas, or ways of solving problems is one of the processes of HOTS thinking skills.

The transformation mistakes made by students are very diverse. Based on the analysis of the answer sheet, some students who already know the information that is known and asked from the questions, not a few still experience difficulties in converting this information into mathematical sentences. Some students wrote down the formula for the volume of a geometric shape, but they wrote the numbers incorrectly.

3. Diketahui	$V \text{ kerucut} = \frac{1}{3} \times \pi \times r \times r \times t$
Ditanya	$= \frac{1}{3} \times 14 \times 12$
Jawab	$= \frac{1}{3} 168 \text{ cm}$
Diketahui	$V \text{ tabung} = \pi \times r \times r \times t$
Ditanya	$= 14 \times 12 \times 14$
Jawab	$= 672 \text{ cm}$
Jadi	$V \text{ kerucut dan } V \text{ tabung adalah } 1344 \text{ cm}$

Figure 4. Transformation Error

Students incorrectly derive each element in formulas such as π , r and t . There were also students who immediately wrote down the results of their answers without writing down the number of each element in the written formula. In addition to the above, there were also some students who were able to calculate the volume of 2 geometric shapes but after that the students did not continue to determine the arithmetic operations to answer the questions on the questions.

1. Diketahui	$V \text{ balok} = p \times l \times t$
	$= 6 \times 20 \times 15$
	$= 1.800$
Jadi	buku yang dimasukkan ke dalam kardus adalah 1.800, 12.600
Diketahui	$V \text{ balok} = p \times l \times t$
	$= 20 \times 30 \times 30$
	$= 12.600$

Figure 5. Transformation Error

Based on the students' answers above, it can be seen that students still have difficulty changing the order of the sentences in the questions into mathematical sentences. Students have not determined the arithmetic operations to find the number of books according to what is asked in the problem. This is in line with Rahmawati & Permata's research (2018) which showed students were unable to make mathematical models and were unable to determine the correct formula and steps to solve the problem. The transformation error in the form of not writing down the answer that should have contained the steps for solving the problem also occurred in one of the students.

2	Diketahui $p = 9 \text{ cm} = 84 = 3 \text{ cm}$ rusuk dan
	ditanya = apa minyak tepat untuk mengisi kubus tersebut
3	Diketahui $r = 6$ $t = 14$ kerucut $r = 6$ $t = 14$ tabung
	ditanya = memakai apa agar lebih cepat

Figure 6. Transformation Error

Based on the student answer sheet above, students write down what is known and asked correctly. The student was able to complete question number 1, but in questions number 2 and 3 there were no steps to solve the problem. Based on the results of interviews with students, students admitted that they were running out of time to complete the questions. This was also found in the study of Ruswati et al. (2018) conceptually students have not been able to generalize word problems through problem solving properly. Students are still confused in finding what steps must be taken to get a solution to the problem given.

Mathematical sentences are synonymous with number arithmetic operations. Count operations are used to find solutions to problems in HOTS type word problems. Using the wrong arithmetic operation will not get the right answer. This happened to several students when working on question number 1.

1.) D: ketahu: Buku dan Kardus / balok

Ditanya: Berapa Paling banyak jumlah buku yang dapat dimasukkan Fahmi kedalam kardus?

Jawab: $v = p \times l \times t$ $v = p \times l \times t$

$= 6 \times 20 \times 15 = 1800$ $= 36 \times 30 \times 20 = 21600$

Jadi jumlah buku yang dapat dimasukkan fahmi kedalam kardus adalah ~~1800~~ $21600 - 1800 = 19800$

Figure 7. Transformation Error

The question asks for the number of books that can be put in a box. Some students are wrong in determining the arithmetic operation, which should use the division operation on 2 volumes of blocks, but students use the subtraction operation. Such as research (Yusnia & Fitriyani (2017) which found students made mistakes at the transformation stage, including because they were wrong in determining the mathematical operations used and difficulties in constructing mathematical connections between mathematical concepts and real problems.

The reason some students are in transformation is that apart from the lack of students' understanding of the questions, students are not used to working on word problems. This was also known in interviews with teachers who explained that students were not used to dealing with word problems. This affects the ability of students to understand the problem and solve the problem using the right steps.

Procces Skills Error

Errors in the process of counting often occur in students. Some students wrote down the volume formula and the numbers correctly, but the results written from the calculation process were not correct. During the interview, students were asked to recalculate the numbers in the volume formula they wrote down. However, some students were not able to multiply these numbers using the bottom layer method. Errors in the process of calculating almost all students made in problem number 3, where in calculating the volume of cylinders and cones there are 2 types of numbers, namely natural numbers and fractional numbers.

3. Diketahui: kerucut dgn t 14 cm, r² 12 cm
 tabung dgn t 14 cm, r² 12 cm

Ditanya: wadah yang lebih baik

Jawab:

$$V_{\text{tabung}} = \pi \times r^2 \times t$$

$$= 22 \times 12 \times 14$$

$$= 3696 \text{ cm}^3$$

$$V_{\text{kerucut}} = \frac{1}{3} \times \pi \times r^2 \times t$$

$$= \frac{1}{3} \times 22 \times 12 \times 14$$

$$= 1232 \text{ cm}^3$$

Jadi wadah yang lebih baik adalah wadah yang berbentuk tabung karena volume tabung lebih banyak dari pada volume kerucut

Figure 8. Proses Skills Error

Almost all students experience errors in the process of multiplying fractions by real numbers. During the interview, several students were asked to recalculate how to multiply the 2 types of numbers. But students do not understand how to multiply them. This shows that students are still not skilled in multiplying natural numbers with fractional numbers. These errors are in line with Oktaviana's research results (2017), based on her findings as many as 88% of students made mistakes in calculations and did not complete the settlement procedure. Students are correct until the process of transforming but experience errors when doing calculations. This also happened in a study by Dinnullah et al. (2019) found that subjects who were wrong at the process skills stage were subjects who were slightly mistaken in the calculation process and subjects who were unable to carry out the mathematical calculation process in the correct steps.

Student errors at the understanding stage and the transformation stage are related to the next step, namely the process skills stage. If students do not understand and do not write down the steps for solving the problem, then students cannot carry out the counting process to find answers. So that students also cannot write down the conclusions of answers to answer questions from the problem. The reason some students are in transformation is that apart from the lack of students' understanding of the questions, students are not used to working on word problems. This was also known in interviews with teachers who explained that students were not used to dealing with word problems. This affects the ability of students to understand the problem and solve the problem using the right steps.

Encoding Error

Based on the answer sheet, there were several students who did not write the conclusion of the answer. This is because students do not write down the steps to solving the problem. Students who do not write down the steps for solving the problem cannot write conclusions to answer what is asked in the problem. Based on interviews conducted with students, students did not write down the steps and conclusions because they ran out of time. Students are only able to work on question number 1, students do not have time to complete questions number 2 and 3.

There are many students who make mistakes in writing the conclusion of the answer. These errors occur a lot, especially in questions number 2 and 3. It can be seen that students who experience errors in the transformation and counting process will experience errors in writing the conclusions of the answers. This happens because when reading the questions students do not really understand so they will experience errors at each stage of problem solving. In addition, there were some students who experienced errors in writing conclusions in the form of wrong answers in writing units.

Diketahui: Sebuah buku berbentuk balok memiliki panjang: 20cm, l: 15cm, dan
 tinggi 6cm. Buku tersebut akan di masukkan kedalam rak dengan ukuran
 panjang: 36cm, l: 30cm, t: 20cm.
 Ditanya: Berapa ^{paling} banyak jumlah buku yang dapat dimasukkan ke dalam
 rak tersebut?
 Jawab: $V = p \times l \times t$ $V = p \times l \times t$
 $= 36 \times 30 \times 20$ $= 20 \times 15 \times 6$
 $= 21.600 \text{ cm}$ $= 1.800 \text{ cm}$
 Jadi banyak jumlah buku yang dapat dimasukkan ke dalam rak = 21.600
 $\div 1.800 = 12 \text{ cm}$

Figure 9. Encoding Error

Based on the student's answers above, the student was able to write down the steps for solving the problem and was almost correct in writing the conclusion of the answer and the final result. However, the conclusion of the answer that the student wrote was not correct, the description of the amount should use the word "fruit" but what the student wrote was "cm". Errors in writing units indicate students are still confused about writing the correct answer conclusions. This is in line with research by Yektiana et al. (2021) which shows that the subject made a mistake in writing the final answer, because he did not write down the conclusion at the end of the answer and did not include a unit at the end of the answer. This causes the conclusion of the answer is not quite right.

Errors in writing the final result in the conclusion of the answer can occur if students experience errors at the stage of calculating the final result. Students can understand and are able to transform questions into mathematical sentences correctly but are wrong when calculating, so these students are also wrong when writing conclusions. This happened to students when solving problem number 1.

1. $V \text{ balok} = p \times l \times t$ Diketahui: buku dengan p 20cm, l 15cm,
 $= 20 \times 15 \times 6$ t 6cm
 $= 1.800 \text{ cm}^3$ Ditanya: banyak jumlah buku yang dapat
 $V \text{ balok} = p \times l \times t$ dimasukkan Fahmi ke dalam kardus
 $= 36 \times 30 \times 20$ Jadi, banyak jumlah buku yang di-
 $= 21.600 \text{ cm}^3$ masukkan Fahmi ke dalam kardus
 $21.600 : 1.800 = 11$ adalah 11 buku

Figure 10. Encoding Error

Based on the student's answers above, the student is able to write down what is known and asked, and is able to transform the question correctly, but is wrong when calculating $21,600 : 1800$, the result of the division should be 12, but the student writes 11. So, the final result is written in Incorrect answer conclusion. This is in accordance with the opinion of Rofi'ah et al. (2019) that errors in writing conclusions were caused by student errors in solving problems in the previous steps.

CONCLUSION AND RECOMMENDATION

Based on the results of research on fifth grade students of Pringgowijayan Public Elementary School, it can be concluded that the types of mistakes made by students in solving HOTS type word problems on geometrical material are: (1) Reading errors in the form of students only looking for volume 1 geometric shape even though there are 2 geometric shapes in the problem space, students wrote wrongly the height of the block, the radius of the cylinder and the cone did not match what was stated in the problem. (2) Misunderstanding in the form of misinterpreting information on questions such as the sentence "pour into a container", students do not know what is known and what is asked of

the problem. (3) The student's transformation error did not continue to determine the arithmetic operation, and the student was wrong in determining the arithmetic operation that should have used the division operation, but used the subtraction operation. (4) Student processing errors miscalculate multiplication, especially fractional numbers. (5) The student's notation error was wrong in writing the conclusion of the answer and the final result. Suggestions from this research for teachers are that teachers can apply problem-based learning related to everyday life, apply learning methods that can encourage students to practice solving problems, and develop various questions to encourage students' creativity in solving problems

REFERENCES

- Aryani, I., & Maulida. (2019). ANALISIS KESALAHAN SISWA DALAM MENYELESAIKAN SOAL MATEMATIKA MELALUI HIGHER ORDER THINKING SKILL (HOTS). *Jurnal Serambi Ilmu*, 20(2), 274–290. <http://ojs.serambimekkah.ac.id/serambi-ilmu/article/view/1409>
- Dinnullah, R. N. I., Noni, E., & Sumadji. (2019). Analisis Kesalahan Siswa pada Penyelesaian Soal Cerita Berdasarkan Tahapan Newman. *Jurnal Tadris Matematika*, 2(2), 175–184. <https://doi.org/10.21274/jtm.2019.2.2.175-184>
- Driana, E., & Ernawati. (2019). TEACHERS' UNDERSTANDING AND PRACTICES IN ASSESSING HIGHER ORDER THINKING SKILLS AT PRIMARY SCHOOLS. *Journal of Teaching & Education*, 1(2), 110–118. <https://journals.umkt.ac.id/index.php/acitya/article/view/233>
- Fatahillah, A., Wati, Y. F., & Susanto. (2017). ANALISIS KESALAHAN SISWA DALAM MENYELESAIKAN SOAL CERITA MATEMATIKA BERDASARKAN TAHAPAN NEWMAN BESERTA BENTUK SCAFFOLDING YANG DIBERIKAN Arif Fatahillah 1 , Yuli Fajar Wati N.T. 2 , Susanto 3. *Jurnal UNEJ*, 8(1), 40–51. <http://jurnal.unej.ac.id/index.php/kadikma/article/view/5229>
- Hanipa, A., Triyana, V., & Sari, A. (2019). ANALISIS KESALAHAN SISWA DALAM MENYELESAIKAN SOAL SISTEM PERSAMAAN LINEAR DUA VARIABEL PADA SISWA KELAS VIII MTs DI KABUPATEN BANDUNG BARAT Akbar. *Journal On Education*, 01(02), 15–22. <http://www.jonedu.org/index.php/joe/article/view/18>
- Hidayati, D. N., Sulistyani, N., & Pantiwati, Y. (2020). Jurnal pendidikan profesi guru. *Jurnal Pendidikan Profesi Guru*, 1(1), 39–50. <https://ejournal.umm.ac.id/index.php/jppg/article/view/12448>
- Himmi, N., & Husna, A. (2020). ANALISIS KESALAHAN MAHASISWA DALAM MENYELESAIKAN SOAL CERITA PADA MATERI PRINSIP INKLUSI EKSKLUSI DENGAN PROSEDUR NEWMAN. *Jurnal Program Studi Pendidikan Matematika*, 9(April), 18–27. [http://download.garuda.kemdikbud.go.id/article.php?article=1611146&val=9446&title=Analisis Kesalahan Mahasiswa dalam Menyelesaikan Soal Cerita pada Materi Prinsip Inklusi Eksklusi dengan Prosedur Newman%0AAsartika%0A%0A](http://download.garuda.kemdikbud.go.id/article.php?article=1611146&val=9446&title=Analisis%20Kesalahan%20Mahasiswa%20dalam%20Menyelesaikan%20Soal%20Cerita%20pada%20Materi%20Prinsip%20Inklusi%20Eksklusi%20dengan%20Prosedur%20Newman%0AAsartika%0A%0A)
- Kania, N., & Arifin, Z. (2018). Pemecahan masalah matematis berdasarkan prosedur newman. *SEMINAR NASIONAL MATEMATIKA DAN PENDIDIKAN MATEMATIKA 2*, 2, 1–10. <https://www.syekhnrjati.ac.id/jurnal/index.php/semnasmat/article/view/3870>
- Mahmudah, W. (2018). Analisis Kesalahan Siswa dalam Menyelesaikan Soal Matematika

- Bertipe Hots Berdasar Teori Newman. *Journal of Mathematics and Computer Science Jurusan*, 4(1), 49–56. <https://core.ac.uk/download/pdf/229346242.pdf>
- Nurfalah, I. A., Novtiar, C., & Rohaeti, E. E. (2021). ANALISIS KESALAHAN SISWA BERDASARKAN KATEGORI NEWMAN DALAM MENYELESAIKAN SOAL MATERI FUNGSI. *Jurnal Pembelajaran Matematika Inovatif*, 4(1), 205–214. <https://doi.org/10.22460/jpmi.v4i1.205-214>
- Oktaviana, D. (2017). ANALISIS TIPE KESALAHAN BERDASARKAN TEORI NEWMAN DALAM MENYELESAIKAN SOAL CERITA PADA MATA KULIAH MATEMATIKA DISKRIT Dwi. *Jurnal Pendidikan Sains & Matematika*, 5(2), 22–32. <https://e-journal.iain-palangkaraya.ac.id/index.php/edusains/article/view/719>
- Rahmawati, D., & Permata, L. D. (2018). ANALISIS KESALAHAN SISWA DALAM MENYELESAIKAN SOAL CERITA PROGRAM LINEAR DENGAN PROSEDUR NEWMAN. *Jurnal Elektronik Pembelajaran Matematika*, 5(2), 173–185. <https://jurnal.uns.ac.id/jpm/article/view/26050>
- Rambe, A. Y. F., & Afri, L. D. (2020). ANALISIS KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA DALAM MENYELESAIKAN SOAL MATERI BARISAN DAN DERET Oleh: *Jurnal Pendidikan Dan Matematika*, 09(2), 175–187. <http://jurnal.uinsu.ac.id/index.php/axiom/article/view/8069>
- Rofi'ah, N., Ansori, H., & Mawaddah, S. (2019). Analisis kesalahan siswa dalam menyelesaikan soal cerita matematika berdasarkan langkah penyelesaian polya. *Jurnal Pendidikan Matematika*, 7, 120–129. <https://doi.org/10.20527/edumat.v7i2.7379>
- Ruswati, D., Utami, W. T., & Senjayawati, E. (2018). ANALISIS KESALAHAN SISWA SMP DALAM MENYELESAIKAN SOAL KEMAMPUAN PEMECAHAN MASALAH MATEMATIS DITINJAU DARI TIGA ASPEK. *Jurnal Ilmiah Pendidikan Matematika*, 5(1), 91–107. <https://ejournal.stkipbbm.ac.id/index.php/mtk/article/view/180>
- Sa'adah, A., Misri, M. A., & Darwan. (2019). Analisis Kesalahan Siswa dalam Menyelesaikan Soal Matematika HOTS Bertipe PISA amirasaadah@syekh Nurjati.ac.id. *Journal For Islamic Social Sciences*, 3(1), 53–64. <https://core.ac.uk/download/pdf/276535329.pdf>
- Saraswati, P. M. S., & Agustika, G. N. S. (2020). Kemampuan Berpikir Tingkat Tinggi Dalam Menyelesaikan Soal HOTS Mata Pelajaran Matematika. *Jurnal Ilmiah Sekolah Dasar*, 4(2), 257–269. <https://ejournal.undiksha.ac.id/index.php/JISD/article/view/25336>
- Setiawan, Y. B., Hapizah, H., & Hiltrimartin, C. (2018). Kesalahan siswa dalam menyelesaikan soal Olimpiade SMP konten aljabar. *Jurnal Riset Pendidikan Matematika*, 5(2), 233–243. <https://journal.uny.ac.id/index.php/jrpm/article/view/18191>
- Wibawa, R. P., & Agustina, D. R. (2019). PERAN PENDIDIKAN BERBASIS HIGHER ORDER THINKING SKILLS (HOTS) PADA TINGKAT SEKOLAH MENENGAH PERTAMA DI ERA SOCIETY 5.0 SEBAGAI PENENTU KEMAJUAN BANGSA INDONESIA. *Jurnal Ilmiah Ekonomi Dan Pembelajarannya*, 7(2), 137–141. <http://ejournal.unipma.ac.id/index.php/equilibrium/article/view/4779>
- Yektiana, S., Indriani, A., & Kholidah, N. R. J. (2021). ANALISIS TIPE KESALAHAN BERDASARKAN TEORI NEWMAN DALAM PEMAHAMAN KONSEP OPERASI HITUNG PECAHAN DI SDI LUQMAN AL-HAKIM BOJONEGORO. *Journal Of Techonolgy Mathematics And Social Science*, 1(1), 28–39. <https://ejournal.ikipgribojonegoro.ac.id/index.php/JTHOMS>

- Yunia, N., & Zanthi, L. S. (2020). KESALAHAN SISWA SMP DALAM MENYELESAIKAN SOAL CERITA PADA MATERI ARITMATIKA SOSIAL. *Teorema: Teori Dan Riset Matematika*, 5(1), 105–116. <https://jurnal.unigal.ac.id/index.php/teorema/article/view/3206>
- Yusnia, D., & Fitriyani, H. (2017). IDENTIFIKASI KESALAHAN SISWA MENGGUNAKAN NEWMAN ' S ERROR ANALYSIS (NEA) PADA PEMECAHAN MASALAH OPERASI HITUNG BENTUK ALJABAR. *Seminar Nasional Pendidikan, Sains Dan Teknologi*, 78–83. <https://jurnal.unimus.ac.id/index.php/psn12012010/article/view/3047>