

## **Failure of 5<sup>th</sup> Grade Elementary School Students to Understand and Plan Problem Solving**

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**Abstract:** This study aims to describe the failure of 5th grade elementary school students in solving problems at the stage of understanding and planning problem solving. Articles are written based on evaluating the results of case studies of students' mistakes in solving problems. The subjects in this case study were two fifth grade students at SDN Percobaan 2 Malang. The stage of understanding and planning the problem solving is the first step is very important in achieving the right solution. To describe students' failures in understanding and planning problem solving researchers use a transcript of think aloud when students do problem solving tests and interviews after completing problem solving tests. The results of this study on students in understanding the problem do not read the questions repeatedly and pay attention to the whole, so that students cannot manage information correctly to be used as material in preparing plans. Students in preparing a settlement plan experience incomplete memories, so that they experience doubts with the truth of knowledge in the previous class. Students have not been able to decide how to correct mistakes made when an error occurs in the results of calculations that he has done.

**Keywords:** failure, understanding, planning, problem solving,

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### **I. Introduction**

Students need caution in understanding problem solving test to ensure that they understand what is being read. Students also need more time to understand the difficult text in the problem solving test, because students must pay attention, visualize information to help remember and understand what is read. This is in accordance with the opinion of Harvey and Goudvis (2007) that awareness of understanding reading is a continuous process and continues to develop in accordance with what the reader thinks. According to Gökhan, et al. (2015) problem solving requires a reading process, namely understanding reading and using mathematical knowledge, as well as the use of mathematical operations. Students are usually aware of problems with what is read, but lack of strategies to correct their confusion, so they need a problem-solving reading strategy. Students who use reading strategies, for example, read slowly and carefully to understand what they are reading, read it again to improve their understanding when they encounter difficult texts. According to Desoete (2001: 57), when children realize that assignments are difficult, they pay more attention to the task and work more slowly so that mistakes are made less. Based on Desoete's opinion, students need to control their thinking processes while solving problems when experiencing difficulties. Students need to read questions more slowly (reading while thinking) and repeat reading when they find difficulties.

Problems are situations or things that need attention and need to be addressed or solved. Mathematical problems can be defined as word problems, stories or verbal problems which are descriptions of situations, in sentences or numbers, that require answers. The ability to solve mathematical problems is also influenced by the ability to read and understand mathematical problems. Reading and understanding mathematical problems have a very close relationship with mathematical achievement. According to Walker, et al. (2008) students' achievement in mathematics is influenced by the level of reading ability. Students who are at a low level of reading tend to be less able to answer correctly. According to Desoete (2006), in solving problems the child needs to read the problem to understand, underline important words, choose relevant information, reread the task to understand better, make pictures, put information together, write down what is asked, write down what is already known, reflect, estimate possible results and show other behaviors toward predictions. Reflection according to Gama (2004) is an activity where someone recaptures his experience, rethinks about it, reconsiders it and reevaluates it.

Problem solving strategies are also needed by elementary students because these students often have difficulty in solving problems. According to Phonaphichat et al. (2014) the problem solving difficulties for 5<sup>th</sup> and 6<sup>th</sup> grade students are classified as follows; 1) Students have difficulty in understanding the keywords that arise in the problem, so they cannot interpret them into mathematical sentences. 2) Students are not able to find

out what to assume and what information is needed to solve the problem. 3) Every time students do not understand the problem, they tend to guess the answer without a thinking process, 4) Students are impatient and do not like to read math problems. 5) Students do not like to read very long problems. Success in solving problems is influenced by students' ability to bring the language of questions to the language of mathematics. This is in accordance with the opinion of Skinner, et al. (2016) that students' success in solving mathematical word problems is based on their ability to translate everyday language into mathematical language. Difficulties in problem solving are also influenced by three things (1) Students are unable to call on prior knowledge because their resistance about prior knowledge is weak. (2) Students cannot select the problem text to become information that should be known which can be used to solve the problem. (3) Students have not been able to find out alternative ways or procedures that are easier in the problem solving process

According to Wilson & Clarke (2002) which states that metacognition is used to refer to an individual's awareness of the results of his own thoughts, evaluate his thoughts and regulate his thoughts. Students who evaluate and manage the results of their thinking in solving problems will have better learning outcomes. This opinion is also supported by Yong and Kiong (2006) that students have better learning outcomes when they organize their thinking processes or students work using metacognitive skills in the mathematical problem solving process.

According to Hartman (2001), metacognition includes thinking about the thinking process itself and the product of his thinking, two fundamental aspects of metacognition are awareness and control of one's thinking. Magogwe (2013) states that the metacognitive strategy involves awareness, reasoning and the process of thinking about the text being read and the understanding gained from the reading. There are three metacognitive functions, namely awareness, evaluation and regulation (Wilson & Clarke, 2004; Shahbari, et al., 2014). These three functions can help students and are an important part in solving problems because students can control the results of thinking. This is supported by Aurah, et al. (2011) which states that metacognition is an important dimension in problem solving because it includes awareness about problem thinking, monitoring and regulating cognitive processes and applying heuristics.

According to Rahman, et al. (2010), students with high metacognitive awareness performed better on tests than students with low metacognitive awareness. Metacognitive awareness influences students' reasoning in problem solving. This is in accordance with the opinion of Heng Ng, et al. (2011) that training strategy interventions for self-questioning techniques have a significant positive effect on student reasoning performance and overall on problem solving performance. This is also supported by the opinion of Ramirez (2013) which states that students' metacognitive awareness embedded in students can solve various types of problems (such as story problems, problem solving / problem diagnosis, decision making problems, and design problems). In solving problems students need knowledge of various kinds of strategies and then choose the right strategy. Knowledge of the strategies used and the accuracy of the selection of these strategies relates to knowledge or awareness of one's own abilities which are included in metacognitive knowledge

## **II. Method**

This research describes qualitatively how 5<sup>th</sup> grade elementary school students fail to solve problems, their awareness of cognitive activities in the problem solving process in understanding and drafting a completion plan. This study involved 6 elementary school students in grade 5A at SDN Percobaan 2 Malang. In taking the research subject, the researcher asked the class teacher about students who have good oral communication skills, that were expected to voice their thoughts (think aloud), when solving the problem solving test (PST). Among the 6 students, two students were indicated to be aware of the problem solving cognitive activities, but did not find the right answer. The two students, according to the class teacher, were categorized into students with middle abilities in their class. Other students were not used as the sample, because (1) The students were in the condition of cognitive activity awareness that can solve the problem and find the right answer, (2) The students were not indicated, in written answers and think aloud, finding cognitive awareness activities in completing the problem.

The researcher used cameras to record the audio visual of think aloud process and the behavior that indicates the elements of students' understanding and planning in solving problems. Interview is done based on the work of the students in problem-solving tests to confirm and explore the results of thinking process. Problem solving test instrument is as follows:

Adnan's mother wanted to make a birthday cake for him. She needed 2 ½ kilos of sugar. She had only 1 ½ kilos of sugar at home. At that time, Adnan's grandmother gave her 15 ons. If the sugar is not enough, mother will buy again. Do you think that she will buy more sugar? Explain the answer whether the mother will buy or not.

The indicator analysis of cognitive awareness in solving problems based on think aloud and written answers of S1 with steps to solve problems is explained in Table 1.

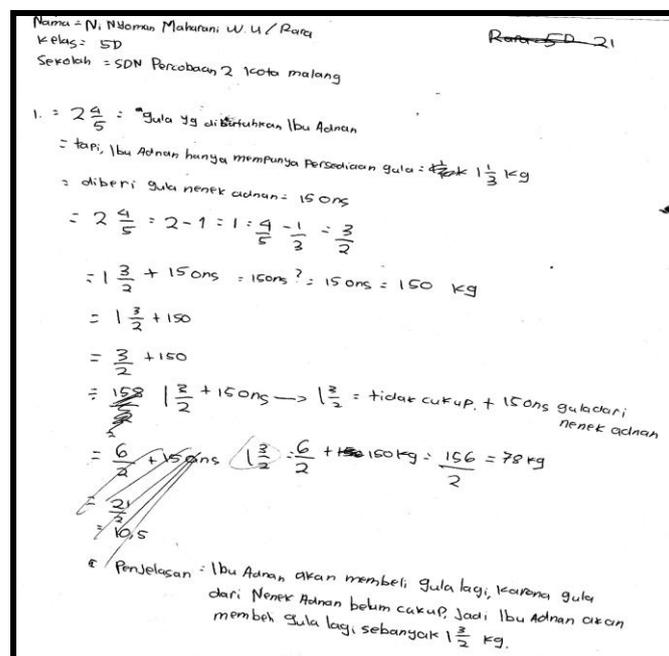
**Table 1.** Steps for Resolving Problems S1

No.	Steps of Solving Problem	Cognitive Awareness Indicators in Solving Pproblem
1	How does the subject understand the problem	There is an indication of awareness of cognitive activities understanding the problem. The subject writes part of the information that is known, what is asked and can state the problem with the sentence itself
2	How does the subject plan the problem solving	There are indicators of cognitive awareness activities in designing plans. The subject carried out a direct reasoning strategy (writing down part of the completion step). The subject used a strategy of equalizing the unit of measurement, equalizing the denominator (using the data contained in the problem).

### III. Finding And Discussion

#### 3.1 Written Results Data, Think Aloud and Analysis

Subject 1 (S1) began working on the Problem Solving Test (PST) by reading the problem aloud and continued with the activity of writing, observing, thinking by voicing what was on his mind (aloud). S1 worked on PST for 14 minutes. S1's written answer is in Figure 1.



**Figure 1.** Written Answer of S1

In solving problems, S1 started by identifying what he knew by writing and rereading the problem, here are S1's transcripts when voicing his thoughts (think aloud). Based on the analysis of the results of the think-aloud and the results of the S1's answers, there was an awareness of activities to understand the problem. Cognitive activity awareness when understanding problems that was done by S1 was by restating problems with his own language. S1 stated verbally and writtenly information that is important in the problem. To find out the truth of the allegations can be seen from S1's verbal statement and written results, as follows:

S1:  $2\frac{4}{5}$  kilos is equal to the sugar needed by Adnan's mother

S1: but Adnan's mother only has  $1\frac{1}{3}$  kilos

S1: Adnan's mother was given by Adnan's grandmother. given means added

S1: Adnan's mother was given sugar by Adnan's grandmother 15 ounces

S1: If the sugar supply of Adnan's mother and her grandmother's gift is not enough to make a cake, then Mrs. Adnan will buy more sugar.

S1 reiterated the problem with a notation by noting "Adnan's mother was given by Adnan's grandmother, given means added, doesn't it". S1 stated information that is important in the problem. S1 paid attention to recognize what conditions were related to the answer to the problem, select (selectivity) information

that was important in the problem. This showed that there was awareness of S1's cognitive activities in understanding problems.

Based on the analysis of the results of the think-aloud and the results of the S1's answers, there is an awareness of the activity in developing a problem solving plan. Cognitive activity awareness, when compiling a plan for solving problems is carried out by writing a part of the completion steps. S1 uses the data contained in the problem. To find out the truth of the allegations can be seen from the S1's verbal statement and the written results as follows:

S1: it is equal to  $2 \frac{4}{5}$

S1:  $2 \frac{4}{5}$ , we just split it into 2 and  $\frac{4}{5}$

S1: 2 minus 1, 1 from sugar supply  $1 \frac{1}{3}$

S1: now  $\frac{4}{5} - \frac{1}{3} = 1 \frac{3}{2}$

S1: How many kilos is 15 ounces?

S1 uses a direct reasoning strategy with a reduction of the amount of sugar needs  $2 \frac{4}{5}$  with the supply

of sugar owned by Adnan's mother  $1 \frac{3}{2}$ . S1 searches for the difference in sugar needs for making cakes with

Mrs. Adnan's sugar, by reducing integers with the integers and fractions with fractions. S1 tries to change the unit weight of 15 ounces to kilos. S1 pays attention to important data to prepare a plan by doing some steps to solve the problem. S1 uses prior knowledge of unit conversion. This shows that there is S1's cognitive activities awareness in developing problem solving plans.

Based on the analysis of the results of the think-aloud and the results of the S1's answers, there was an awareness of the activities in implementing the problem solving plan. S1's cognitive activities awareness, when implementing a problem solving plan by performing calculations based on the method that has been determined. S1 corrects errors when implementing plans. To find out the truth of the allegations can be seen from S1's verbal statement and the written results, as follows:

S1:  $1 \frac{3}{2} + 15$  ounces (what are 15 ounces?)

S1: 15 ounces is the same as how many pounds?

S1: 15 ounces to kilo means "zero plus one"

S1: 15 ounces and 150 kilos

S1:  $\frac{3}{2} + 150$  (what is 150 divided by 2)

S1 attempts to convert ounces to kilos by multiplying it to 10. S1 implements the plan by carrying out the addition of the remaining sugar needs to make the cake with the given sugar by Adnan's grandmother, that is

$1 \frac{3}{2} + 15$ . S1 pays attention to what he is writing by making corrections (deletion) during the implementation of the plan. This shows that there is S1's cognitive activities awareness in implementing the problem solving plan.

To find out the awareness of cognitive activities in solving the following problems, some interview footage between Researcher (P) and Subject 1 (S1). In solving problems, there is an indication of S1's cognitive activities awareness in understanding the problem. This can be seen in the interview's footage to clarify the results of think aloud and written answers of S1 below:

Interview footage

P: what do you mean  $2 \frac{4}{5}$  kilos?

S1: sugar needed by Adnan's mother

P: what do you mean  $1 \frac{1}{3}$  kilo?

S1: Adnan's mother only has  $1\frac{1}{3}$  kilo

S1: sugar needed by Adnan's mother  
What is 15 ounces?

S1: Adnan's mother was given sugar by Adnan's grandmother 15 ounces

P1: what is the purpose of the problem?

S1: If the sugar supply for Adnan's mother and her grandmother's gift is not enough to make a cake, then Adnan's mother will buy more sugar

### **3.2 Subject 1 (S1) Response Analysis**

The interview footage shows that S1 has done attention (focusing on the text of the question) with the discovery of important information in the problem. S1 has selected (selectivity) the problem text that he can use to answer the problem. This shows that he, in cognitive awareness, understands the problem. In resolving the problem, S1 has an indication of awareness in drawing up a plan. This can be seen in the interview footage of S1's results of the think aloud and written answers below:

Interview footage

P: 2-1 from which Kilos?

S1: 2 of  $2\frac{4}{5}$  and 1 of  $1\frac{1}{3}$

P: why  $(1\frac{3}{2} + 15 \text{ ounces})$  are added up?

S1: because of being given by Adnan's grandmother

P: 15 ounces why do you give question mark?

S1: to equal it to units of kilo

The footage of the interview shows that S1 has focused on the question text by separating integers from fractions before carrying out a subtraction operation. S1 strives to remember previous knowledge, which is to make 15 ounces to kilos. This shows that he is in cognitive awareness to plan problems.

S1 in solving problems indicates the awareness in implementing the plan. This can be seen in the interview footage of the results of S1's think aloud and written answers below:

Interview footage

P: why do you cross it out?

S1: because of miscalculations

P: why  $(1\frac{3}{2} + 15 \text{ ounces})$  are added up?

S1: because given by grandmother

P: why is this like this  $(1\frac{3}{2} = \frac{6}{2} + 150 = \frac{156}{2} = 78)$ ?

S1: used as an ordinary fraction then added by grandmother's gift

The footage of the interview shows that S1 has done attention to carry out the plans that have been prepared. There is a correction to the results of the calculation so that he writes down and revises the implementation of the plan. S1 is consistent in calculating the remainder from the reduction in sugar requirements with Adnan's inventory to be summed up with Adnan's grandmother's gift. S1 maintains attention to carry out mathematical operations in solving problems. This shows that he is in cognitive awareness implementing the plan that he collects.

Based on the results of the analysis of written answers, think aloud and analysis of interview data, then a comparison is made to find out whether the data obtained is valid or not.

Based on the results of S1 written answer analysis and aloud think obtained:

1. There is awareness of cognitive activities (attention, selectivity) in solving problems, but understanding does not lead to the preparation of the right plan.
2. There is awareness of cognitive activities (attention, recall knowledge) in planning problem solving, but has not found the right strategy about the way that is used so he just tried.
3. The awareness of cognitive activities (attention) in carrying out the plan, but the preparation of plans that are made does not lead to the correct answer, so the subject carrying out operations in accordance with what he had planned

### 3.3 Written Results Data, Think Aloud and Analysis

The second subject (S2) began working on the Problem Solving Test (PST) by reading the problem aloud and continued with the activity of writing, observing, thinking by voicing what was on his mind (aloud). S2 works on PST for 9 minutes. S2's written answers are in Figure 2 below.

Yang di butuhkan Ibu Adnan =  $2\frac{4}{5}$   
 + yang di miliki =  $1\frac{1}{3}$  kg gula  
 + yang di berikan nenek adnan = 15 ons

cara  $2\frac{4}{5} - 1\frac{1}{3} = (2-1) + (\frac{4}{5} - \frac{1}{3})$   
 $= 1 + (\frac{4}{5} - \frac{1}{3})$   
 $= \frac{4}{5} - \frac{1}{3}$   
 $= \frac{4}{5} - \frac{1}{3} = \frac{4}{15} - \frac{1}{15} = \frac{3}{15} = \frac{2}{15}$   
 $\frac{2}{15} + 15 \text{ ons}$   
 $= \frac{2}{15} + \frac{225}{15}$   
 $= \frac{227}{15}$   
 $= \frac{13}{15} \text{ kg}$

$= 2\frac{4}{5} - \frac{13}{15}$   
 $= 2\frac{4}{5} - \frac{14}{15}$   
 $= \frac{14}{5} - \frac{13}{15} = \frac{17}{15} - \frac{13}{15}$   
 $= \frac{17}{15} - \frac{13}{15} = \frac{4}{15}$

Jadi, Ibu Adnan akan membeli gula lagi sebanyak  $\frac{4}{15}$  kg, karena ibu adnan hanya masih mempunyai  $\frac{13}{15}$  kg gula, maka ibu adnan harus membeli  $\frac{4}{15}$  kg gula.

Figure 2. Written Answer of S1 Subject.

Based on the indicators of cognitive activity awareness in solving problems in the aloud thinking and the results of the S2's answer above, then it can be assumed that S2 experiences an cognitive activities awareness to understand the problem. To find out the correctness of the allegations, the following is S2's written verbal statement:

S2: what is needed by Adnan's mother is  $2\frac{4}{5}$

S2: she has  $1\frac{1}{3}$  kilo.

S2: given by Adnan's grandmother 15 ounces

S2 consciously understands the problem by paying attention to the information in the problem, declaring what is known, thinking about what is asked and what conditions to fulfill the answer to the problem.

To find out the planning cognitive activities awareness in the problem solving process, namely S2 knows the strategies used in solving problems can be seen based on the following verbal statement data:

S2: method  $2\frac{4}{5}$  minus 1

S2: 2 minus 1 plus  $\frac{4}{5} - \frac{1}{3}$

S2:  $\frac{4}{5} - \frac{1}{3}$  equated the denominator to 15

S2: ounces is made into kilos

S2 used a direct thinking strategy, that is by making a reduction and addition operation by separating integers and fractional parts. S2 tried to remember the unit of weight from ounces to kilo. S2's written work and think aloud can indicate awareness of cognitive activities to carry out problem solving plans.

To find out the implementing plans cognitive activities awareness in solving problems can be seen from the S2's verbal statement when working on problem solving tests. S2 did a reduction operation, additional according to what he has planned. This can be seen from the following S2's verbal statement:

S2:  $\frac{2}{15} + 15$  ounces equal to  $(\frac{2}{15} - \frac{15}{15})$

S2: equal to 15-2, equal to  $\frac{13}{15}$  kilo.

S2: with  $2\frac{4}{5}$  minus  $\frac{13}{15}$

S2:  $2\frac{4}{5}$  is the same as  $\frac{14}{5}$

S2:  $\frac{14}{5}$  reduced by  $\frac{13}{15}$

S2: equal to  $\frac{17}{15}$  minus  $\frac{13}{15}$  equal to  $\frac{4}{15}$

S2 carried out the plan by carrying out the additional operation as a result of reducing the sugar needs with the supply of sugar, then adding it to Adnan's grandmother gift. S2 made calculations until the final results to determine the sugar needs that Adnan's mother had to buy as much as  $\frac{4}{15}$

To find out the cognitive activities awareness in solving problems, the following are some footage of interviews between Researchers (P) and Students (S2). S2 solved the problem and indicated the awareness in understanding the problem. This can be seen in the interview footage to clarify the results of think aloud and written answers of S2:

Interview footage

P : what do you mean by  $2\frac{4}{5}$  ?

S2: the sugar needed by Adnan's mother to make cakes

P : what do you mean by  $1\frac{1}{3}$  Kilo?

S2: owned by Adnan's mother before

P : What is 15 ounces?

S2: sugar given by grandma to Adnan's mother

P: What is the purpose of the problem?

S2: If the sugar supply for Adnan's mother and her grandmother's gift is not enough to make a cake, then Adnan's mother will buy more sugar

The footage of the interview shows that S2 has been searching for important information that can be used to answer questions. S2 has done attention (focusing on the question text) with the discovery of important information in the problem. S2 has selected the question text that he can use to answer the problem. This shows that he is in cognitive awareness to understand the problem.

In resolving the problem there is an indication of cognitive activities awareness in arranging a plan carried out by the S2. This can be seen in the interview footage from the S2's think aloud and written answers below:

Interview Footage

P:  $(2\frac{4}{5} - 1\frac{1}{3})$  where is your inspiration? why minus

S2: need  $2\frac{4}{5}$ , have  $1\frac{1}{3}$ , so we subtract it

Q: (2-1) where is it from?

S2: 2 from  $2\frac{4}{5}$  and 1 from  $1\frac{1}{3}$

P: why  $(2-1) + (\frac{4}{5} - \frac{1}{3})$  added up?

S2: because the results are combined (2-1) with results  $(\frac{4}{5} - \frac{1}{3})$

### **3.4 Analysis of Subject 2 (S2) Response**

The excerpt of the interview shows that S2 has searched for important information contained in the problem text to be used to answer the problem. S2 has done attention (focusing on text problem) by separating integers from fractions before carrying out a subtraction operation. S2 has carried out a reduction operation of sugar needs to make cakes with sugar supplies from Adnan's mother. S2 has carried out activities considering previous knowledge, namely making 15 ounces to kilo by trying to remember the knowledge in the previous

class, but not changing it to kilo because he does not remember the unit size of weight. This shows that he is in cognitive awareness in developing a problem solving plan.

In resolving the problem there is an indication of cognitive activities awareness carrying out the plan by S2. This can be seen in the interview footage from S2's think aloud and written answers:

Interview Footage

P: ( $\frac{4}{5} - \frac{1}{3}$ ) where is this from? become ( $\frac{4}{15} - \frac{1}{15}$ )?

S2: from ( $2\frac{4}{5} - 1\frac{1}{3}$ )

P: ( $\frac{4}{5} - \frac{1}{3}$ ) why become ( $\frac{4}{15} - \frac{1}{15}$ )?

S2: because 15 can be divided by 5 and can be divided by 3

P: ( $\frac{2}{15} + 15$  ounces) why is it added up?

S2: Because Grandma gave sugar to Adnan's mother

The footage of the interview shows that S2 has done attention focusing its attention and carrying out a plan that has been prepared by carrying out reduction and addition operations. S2 is consistent in calculating the remainder of the sugar-capping needs with the supply of Adnan's mother to add to Adnan's grandmother gift. S2 maintain attention to carry out mathematical operations in solving problems. This shows that he is in cognitive awareness in implementing the plan that he collects.

The results of written answer analysis, think aloud and analysis of interview data, then made a comparison to find out whether the validity of the data obtained is valid or not.

Based on the results of the S2 written answer analysis, think aloud, and interviews obtained:

1. There is cognitive activities awareness in solving problems. The subject can be confirmed by the written results indicated to understand the problem, because the subject can explain what he has written, but understanding does not lead to the preparation of a plan to get the right solution.

2. The cognitive activities planning awareness in solving problems. The subject can be confirmed with questions that indicate making a plan, but the subject's answers do not lead to the preparation of the plan leading to the correct answer.

By comparing the results of written work, think-aloud and the results of interviews from S2, it can be seen that the data obtained indicate similar characteristics, namely awareness of cognitive activities (1) understanding problems, (2) developing plans. Based on data obtained in writing, think aloud is the same as data obtained through interviews, then the data obtained is said to be valid.

The two subjects' have done cognitive activities to understand the problem because there are indications of activity paying attention to the reading text of the problem and selecting important information in the problem. The activity of all subjects in paying attention and selecting important information in the problems can be known by researchers based on the transcript of the think aloud, their expressions when working on the problem solving test and the written results of their answers. Based on the activities of all subjects in conducting attention activities and the process of selecting important information in the problem, all subjects are in a state of awareness. All subjects read to explore important information used in problem solving. This is in accordance with the opinion of Gökhan, et al. (2015) that problem solving and reading comprehension basically work together and do so by utilizing different resources to achieve goals. All subjects who have carried out activities pay attention, selecting important information in the problem can already know what should be known (knowing about knowing). This is supported by Skinner et al. (2016) that students' success in solving mathematical word problems is based on their ability to translate their daily language into mathematical language.

S1 and S2 also know what is being asked, but they do not know exactly what conditions are needed in connection with what is asked. This is because S1 and S2, in reading questions, are not careful to understand what is read. When experiencing difficulties, S1 and S2 do not carry out reading activities repeatedly to understand the contents of the reading matter. S1 and S2 have not been able to use the reading strategy in the text about problem solving. This is in accordance with the opinion of Mokthari & Sheory (2002) about reading strategies in problem solving that someone reads slowly and carefully to make sure he understands what is being read, when he finds the difficult text he reads it again to improve his understanding. According to Desoete (2001: 57) when children realize that assignments are difficult, they pay more attention and work more slowly so that mistakes are made less.

In reading problems, S1 and S2 do not conduct comprehensively so that what is understood is also not comprehensive. This is in accordance with the opinion of Harvey & Goudvis, (2007) which states that reading comprehension awareness is an ongoing process, continues to develop in accordance with what the reader

thinks. Awareness of S1 and S2 in understanding problems cannot determine the conditions needed in connection with what is asked about this according to researchers because S1 and S2 do not use reading strategies that arrive at the stage of comprehending comprehensively what is being read. This was stated by the researcher included in the category of students who failed to understand the problem.

S1 and S2 experience awareness of cognitive activities in developing plans that cannot yet lead to the correct solution. This can be caused by students not familiar with the unit of measure of weight, so it is easy to forget about the unit of measure of weight. This can be caused by a call to long-term memory that doesn't work. The failure to call this long-term memory can be caused when learning the unit of measure of weight the student does not carry out the rehearsal process, which is a cognition process where information will be repeated continuously so that individuals can remember it. This is in accordance with the opinion of Arend (2016) that the rehearsal strategy assists attention and processes coding and includes tasks by memorizing, reading items from the list, copying material, or underlining important parts.

S1 and S2 have not been able to use alternative strategies when making plans, so that when there is a deadlock in solving problems, they just continue what was planned. They use strategies but do not raise awareness that reaches the accuracy of what they are doing. This is in accordance with the opinion of Erbas & Okur (2010) that when students display awareness of the need for change, they cannot decide on new strategies and usually stop problems without answers. If students show a lack of adaptability, failure is inevitable and ends with the wrong or partially correct answer.

Another thing that causes failure in planning is related to the lack of conceptual and procedural knowledge possessed by S1 and S2. S1 and S2 have not yet reached the stage of consciousness that comes to other procedures that can be used to solve the problem at hand.

S1 and S2 have not been able to represent meaning into appropriate mathematical operations, which are found in the words or sentences in the problem text, so that when S1 and S2 arrange a completion plan it does not lead to the correct answer. S1 and S2 have not been able to organize information in the problem solving text into a series of information that can be used to compile information that leads to the correct answer. S1 and S2, in solving problems, have not used cognitive strategies that can be used to develop plans that lead to the correct solution. This is consistent with the opinion of Livingston (1997) where cognitive strategies are used to help individuals achieve a particular goal (for example understanding a reading).

In the implementation of the plan, students often make operational errors in fractions. It is necessary for teachers to intervene in students to teach metacognition skills when solving problems. This is consistent with the opinion of Heng Ng, et al. (2011) that metacognitive awareness interventions have a significant positive effect on student reasoning performance and overall problem solving performance. S1 and S2 are not familiar with matters relating to decision making, because S1 and S2 can still choose the decision to buy sugar or not buy sugar based on the results of the answers obtained

#### **IV. Conclusion**

Students understand the problem when students have made mental concentration by writing down information that is known and stating the problem in their own sentence. Students know what should be known by declaring important information on the problem. Students make text selection on problems that can be used as data to solve problems, thus there is awareness of students' cognitive activities when understanding problems. In addition, researchers found the characteristics of students who have failed to solve problems at the stage of understanding the problem. Students pay attention to the problem by reading the problems but not thoroughly / incompletely, so that students cannot manage information well to be used as material in planning. Students have not been able to select word / text information into meaningful information, so students experience confusion, in connection with the conditions needed to answer what was asked.

Students, in preparing student plans, need prior knowledge to carry out strategies that facilitate the calculation. Students pay attention to the completion strategy based on the data obtained from the results of understanding the problem. Thus there is awareness of the cognitive activities of students when preparing a problem solving plan. In addition, researchers found the characteristics of students who have failed in solving problems at the stage of planning. Students experience incomplete memories, so they experience doubts with the truth of knowledge in the previous class. Students who have experienced doubts about the truth of knowledge in the previous class, so that he made a mistake in converting units. Students do not try to use alternative strategies in preparing a settlement plan, so that when an error occurs in part of the problem solving steps students do not know it. Students do not master the underlying concept of fractions to solve the problem.

#### **Suggestion**

Description of the 5<sup>th</sup> grade elementary school students who have failed in solving problems are built based on limited specialized literature. Thus it is realized that there is still a lack of in-depth study of the problems in this study. Problems developed to dig deeper into the stage of understanding and planning in solving problems have not focused on problems that require a varied resolution process so that disclosure of

aspects of awareness and causes of failure to solve problems has not been maximally obtained. So that for further research it is necessary to describe understanding the problem and formulating a plan for solving problems with different study objects in solving other mathematical problems such as geometry problems.

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