

## The Awareness Process of Elementary School Students in Solving Problem

Timbul Yuwono<sup>1</sup>, Purwanto<sup>2</sup>, Abdur Rahman As'ari<sup>3</sup>, Cholis Sa'dijah<sup>4</sup>

<sup>1</sup>(Mathematics Education, Kanjuruhan of Malang, Indonesia)

<sup>2</sup>(Mathematics Education, State University of Malang, Indonesia)

<sup>3</sup>(Mathematics Education, State University of Malang, Indonesia)

<sup>4</sup>(Mathematics Education, State University of Malang, Indonesia)

Corresponding Author: Timbul Yuwono

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**Abstract:** The article aims at describing the awareness process of elementary school students in solving problem. The article is starting from evaluating the results of the case study of students' mistakes in solving the problem. The subject in this case study is three 5<sup>th</sup> grade students of SDN Percobaan 2 Malang. Student awareness process is based on three categories that occur in students that is lack of awareness, pre-awareness, and awareness. Researchers used awareness aspect of Solso (2008) and problem-solving episode of Fisher (1998). Analysis of think aloud transcript and interview of the student's work showed the awareness of students to solve problems and found students identify problems, identify and define the elements of a given situation that requires awareness aspect of attention, wakefulness, emotive and selectivity. Students represent a problem and require awareness aspect, recall knowledge, students plan and how to implement them require awareness aspects of architecture, students evaluate the results by using emergence awareness aspect, novelty.)

**Keywords:** awareness, problem solving,

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### I. Introduction

Awareness is associated with terms ability, perception, mood, and cognition (Arp, 2007). Garofallo & Lester (1985) said researchers believe that success depends on the cognitive performance not only having adequate knowledge, but also sufficient awareness and knowledge control. According to Hartman (2002) metacognition includes thinking about their own thinking processes and the products of thinking. Two fundamental aspects of metacognition is awareness and control over one's thoughts. According to Desoete (2001) the child becomes aware of the difficulty of the task, they can pay more attention and work more slowly to make fewer mistakes. In addition, children reflect the results that make the children learn from their mistakes and successes. According to Erbas & Okur (2010) lack of awareness in being aware of the error and someone can only solve the problem because of external guidance.

Someone has awareness that is not through the process of implicit knowledge (knowledge based on feelings, beliefs and principles) formed. Implicit knowledge can support the assessment of whether new things is in accordance to the previous assessment (Efklidesa & Misailid, 2010). According to Morin (2011) self-awareness is the capacity to become the object of attention itself. A person in this state actively identify, process, and store information about his/herself.

In metacognitive awareness, Shanno (2008) based on Flavell explained that there are three types of metacognitive knowledge, the first is awareness of knowledge to understand what is known, what is unknown, and what we want to know. Second is awareness of thinking, that is understanding the cognitive task and the nature of what is needed to try to solve. The third is awareness of thinking strategy, that is understanding the approach to direct their learning. Awareness in terms of reading, according to Harvey S. and Goudvis A. (2007) awareness of reading comprehension is a continuous process and continue to develop in accordance to what is thought by readers. According to Solso (2008) the characteristics of the framework of awareness includes: attention (concentration, mental power to things external and internal), wakefulness (awareness as a preparedness), architecture (the physical location of structures physiological), recall of knowledge (information retrieval process of the individual concerned and the world around him), emotive (affective components associated to awareness). It is completed with the secondary attributes (novelty, emergence, and selectivity).

Awareness in reading is a continuous process in accordance to what is thought by readers, so someone in solving the problem requires reading by thinking. Solving the problem requires the builder information on the relationship between the text and the expected results. To obtain the expected results on solving the problem requires a method that matches the information in the text. According to Erbas & Okur (2010) students must

have knowledge of mathematics necessary vocabulary and good to solve problems using different strategies, but they also must know when and how to use the strategy, along with monitoring and regulating the process of solving problems using metacognitive skills. According to Gökhan O. et al (2015), the troubleshooting requires reading, namely reading comprehension and use of mathematical knowledge, as well as the use of mathematical operations.

Problems are situations or things that require attention and need to be addressed or resolved. Mathematical problem can be defined as the problem word, story or a verbal description of the situation, in a sentence or numbers, which need answers. Mathematical problem-solving skills are also affected by reading skills in mathematics. According to Walker et al. (2008) students' achievement in mathematics is influenced by the level of literacy, a low classification ability in reading are less likely to get the right answer. According to Desoete (2006) in solving the problems, children need to read a problem for understanding, underlining important words, selecting relevant information, read his duties again for better understanding, make a picture, put the information together, write down what was asked, write down what already known, reflect, predict possible outcomes, other behavior that pointed toward prediction. According to Phonaphichat, et al (2014) problem-solving difficulties in children of grades 5 and 6 primary schools are classified as follows: 1) Students have difficulty in understanding the keyword issue, so they cannot interpret it into a mathematical sentence. 2) Students are not able to figure out what should be assumed and what information of the problems that need to be solved, 3) when the students do not understand the problem, they tend to guess the answer without thinking process, 4) students are impatient and do not like reading mathematics problems, and 5) Students do not like to read very long problem.

In the process of problem solving required metacognitive process in accordance with the opinion of Kuzle (2015) the use of metacognitive processes (planning, monitoring, testing, revising, and evaluating) support during the process of problem solving solutions and enhance their ability to get a goal. Jacobse, & Harskamp (2012) explore the more practical way to measure metacognition of fifth grader elementary school children in solving problems by using instrumental protocols think aloud, Visa (Visualization and Accuracy) and questionnaires. Cozza & Orenshkina (2013) studied the patterns of problem-solving in the process of cognitive and metacognitive of students grade 4 and grade 5 in the context of cooperation and examine the patterns of social interaction in the group during the troubleshooting. The pattern of problem solving is free, which is a dynamic process of moving back and forth, between the exploration, testing, implementation of new ideas and processes of cognitive and metacognitive students in solving problems. Baidawi (2016) studied the awareness that refers to the process of attention and recall information and setting the thinking, planning, monitoring and evaluating the students who have done the on the job training. His research also produced a pattern of cognitive and metacognitive processes.

In this study, the awareness process of 5<sup>th</sup> grader students to solve problems used the interview instrument based on the results of student work (think out aloud) and think aloud instrument. In this study, in resolving the issue is built individually and not in groups as was done by Cozza & Orenshkina (2013). In this study the awareness of elementary school students in problem solving refers to attention (concentration, mental power to the external and internal things), and the previous knowledge given (recall knowledge), wakefulness (awareness as a preparedness), architecture (the physical location of physiological structures), recall of knowledge (information retrieval process of the individual concerned and the world around him), emotive (affective components associated with awareness) and secondary attribute (novelty, emergence, selectivity). This research is concerned to the whole framework of awareness, while Baidawi (2016) examined the process that built awareness of attention and information recall.

Lack of success in the learning approaches of Polya heuristic strategies is a lack of understanding of the students about how students make the decision when, where, why, and how to use heuristics, strategies, and action metacognitive (Schoenfeld, 1992). It is also consistent with the results of research by Sokoriyanto (2015) using Polya episode that showed students still make mistakes in understanding the problem, students are still making mistakes in stating problem, and still have an error in rechecking the given problem. According to Schoenfeld, (2007) early research focused on the correlation between the use of various coping strategies and problem-solving success. Further studies were performed to characterize the problem-solving process and its impact on solving the problem to be more successful.

This case study describes how the process of awareness of elementary school students in solving problems. The process will impact on the awareness of elementary school students in order to resolve the error when the students identify problems, planning in solving problem, resolving errors of planning and implementation process can revise the results of troubleshooting. Practitioners of education, namely primary school teachers can use learning strategies to shape students' awareness process for solving problems, so it is expected that students can solve the problem easily.

**II. Method**

The subject of this study is 3 students of grade 5 in the elementary schools of SDN Percobaan 2 Malang. Subject retrieval procedures on the basis of consultation with the teacher of 5 grader by considering students who have good communication. The awareness process of students in solving problems using the framework of awareness by Solso (2008) that includes attention, wakefulness, architecture, recall of knowledge, emotive, and secondary attribute (novelty, emergence, selectivity). Problem-solving episode is using Fisher (1998) four important metacognition process in solving problems (1) Recognize the problem, identifies and defines the elements of the given situation. (2) Represent the problem, create a picture of the problem, making comparisons with the other. (3) Planning how to carry it out, decide the steps, set target. (4) evaluate the results and settlement were made.

The researcher used an instrument of problem solving test that has been validated bay three experts in the field. The researcher used cameras to record the audio visual of think aloud process and the behavior that indicates the elements of students’ awareness 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 bay more sugar? Explain the answer whether the mother will buy or not

**Table 1.1** Characteristics of Awareness Framework

Awareness Aspects	Description
Attention	The subjects can recognize the problem that is whether Adnan’s mother will buy any sugar or not. The subjects identified the needs in making the birthday cake by writing down the need of sugar, writing down the sugar left and writing down the number of sugar given by grandmother.
Wakefulness	
Architecture	The subjects keep their thinking concentration and are arousal to finish the problem solving test.
Recall Knowledge	The subjects use and construct background knowledge; mixed fraction, adding the fraction, using the least common multiple.
Emotive	The subjects represent the relation among the information in the problems, that is making the connection between a unit of measurement known as equating weight unit of measurement The subjects do not enjoy to finish the problem solving test (in a bad mood). The subjects are in a hurry in finishing the problem solving test, do not pay attention to the whole problem solving test.

**Table 1.1** Characteristics of Awareness Framework

Awareness Aspects	Description
Emergence	The subjects did self-reflection by revising the result of the thought by writing off and using correction pen to erase the answer in the work sheet
Novelty	The subjects reread the test and tried to find out new things that had not been understood or found yet. Then the subjects got a creativity by comparing the amount of the sugar need and the sugar left and the sugar given by grandmother to determine which one is more.
Selectivity	The subjects did selectivity to the text in the problem solving test that can represent the mathematics operations.

**III. Finding and DiscusSion**

The Data obtained from interview transcripts think aloud and problem-solving based on test results of students to be confirmed and explored the results of thinking. Data think aloud and identified students’ interview verbal statements and behavior that identifies the elements of awareness. Researchers obtain the results of the troubleshooting test of S1 subject, how should think when reading. Subject S1 had not been able to get the truth of facts information on problem-solving tests. Further information is correct facts that can be used to identify the problem, identify and define the problem, so the researchers named these conditions as lack of awareness as shown Figure 1.

Jawab:  $(2\frac{4}{5} \text{ kg} - 1\frac{1}{3} \text{ kg}) + 15 \text{ ons} = \dots$

$$\begin{pmatrix} 2-1 = 1 \\ \frac{4}{5} - \frac{1}{3} = \frac{3}{2} \end{pmatrix} = 1\frac{3}{2} \text{ kg}$$

$1\frac{3}{2} \text{ kg} + 15 \text{ ons} =$

$$\frac{5}{2} \text{ kg} + \frac{15 \text{ ons}}{1} = \frac{20}{3} = 6\frac{18}{3} : 3$$

$$= 6\frac{6}{1} \text{ kg}$$

$$= 6,6 \text{ kg}$$

tidak, karena gula cukup untuk membuat kue tart ~~untuk~~ ulang tahun Adnan

Figure 1 The test result of the student's work (subject S1) that had lack of awareness

Based on the test result did by subject S1, then the researcher interviewed the subject;

R: where are  $2\frac{4}{5}$  kilos from?

S1:  $2\frac{4}{5}$  is the need to make Adnan birthday cake

R: Where can you get minus (-) sign?

S1:  $1\frac{1}{3}$  is the mother's sugar to make the birthday cake, but it is not enough, so  $(2\frac{4}{5} \text{ kilos} - 1\frac{1}{3} \text{ kilos})$

R:  $(2\frac{4}{5} \text{ kilos} - 1\frac{1}{3} \text{ kilos}) + 15 \text{ ons}$ , why do you add (+) it?

S1 : Because grandmother gave 15 ons sugar.

R: Where do you get 2-1?

S1: from the mix fractional  $(2\frac{4}{5} - 1\frac{1}{3})$ , those are  $2 - 1 = 1$

R : where is it from  $(\frac{4}{5} - \frac{1}{3} = \frac{3}{2})$ ?

S1 :  $4-1=3$  and  $5-3=2$ , it become  $\frac{3}{2}$

R :  $1\frac{3}{2} \text{ kilos} + 15 \text{ ons}$ , where is it from  $(\frac{5}{2} \text{ kilos} + \frac{15}{1} \text{ ons} = \frac{20}{3} = 6\frac{18}{3} = 6,6 \text{ kilos})$ ?

S1 :  $\frac{5}{2}$  kilos from the mix fractional  $1\frac{3}{2}$  kilos and  $\frac{15}{1}$  ons from 15 ons,  $\frac{20}{3}$  from  $5+15$  and  $2+1$

R : have you ever got a material "unit of weight"? in what grade?

S1 : yes I have, in grade 2 and 4

R : what is 6,6 Kilos?

S1 : the amount of Adnan's mother sugar to make the birthday cake.

R1 : how much the need to make the cake?

S1 :  $2\frac{4}{5}$  kilos

R1 : Which one is bigger? 6,6 kilos or  $2\frac{4}{5}$  kilos

S1 : it should be ..... bigger :  $2\frac{4}{5}$  kilos

R1 : how can we change 6,6 into mix fraction?

S1 :  $6 \frac{6}{10}$

R : which one is bigger?  $6 \frac{6}{10}$  or  $2 \frac{4}{5}$ ?

S1 : it should be  $6 \frac{6}{10}$

R1 : what is the conclusion?

S1 : Adnan's mother didn't need to buy more sugar, because the sugar was enough to make the birthday cake.

The results of students' work and interviews of the subject S1 from SDN Percobaan 2 Malang Grade 5 when solving problems in reading the questions were still including the tacit reader, which was less awareness (lack of awareness), how the subject S1 thinking when reading can be seen when S1 directly perform calculations ((  $2 \frac{4}{5}$

kilos -  $1 \frac{1}{3}$  kilos).). S1 subjects experienced less awareness, as did the concentration of mental power (attention)

to understand the matter. Subject S1 did not understand the meaning of each sentence in the problem solving tests. Lack of awareness of how the subject S1 should think when reading results in a failure to recognize the problem, namely when Adnan's mother should buy or not buy more sugar. Subject S1 had not been identified and defining the elements of a given situation in a matter of problem solving test, when subjects S1 wrote: ((  $2 \frac{4}{5}$  kilos-  $1 \frac{1}{3}$  kilo) + 15 ons. Subject S1 fails in declaring what it should be known (declarative knowledge),

namely the need of sugar to make a cake, mother's sugar supplies and got extra sugar from Adnan's grandmother. Subject S1 did not do a thorough attention that impact as well to no more ideas how the process should meet the demands of the task (procedural knowledge), when subject S1 wrote ( $2 \frac{4}{5} - 1 \frac{1}{3} = 1 \frac{3}{2}$ ) by

writing 1 obtained from  $2-1$  and  $\frac{3}{2}$  obtained from the numerator  $4-1$  and denominator  $5-3$ . S1 subjects who

experienced these conditions also impacted usage failure, when the declaration of knowledge and procedural knowledge used (conditional knowledge).

Subject S1 did the test in an emotive that does not support. He is in a hurry to finish the answer. Subject S1 did problem solving tests using a fairly short period of 10 minutes, this indicates that the student is less enjoy (bad mood) in solving the problem-solving test. Subject S1 failed in the recall of knowledge at the time equating ounce weight units to kilos. S1 subjects who failed to recall knowledge cannot represent a problem. Subject S1 also failed in the aspects of architecture, which reconstructed the existing knowledge and studied before. Subject S1 cannot use previous knowledge in the form of fractional arithmetic operations by using the least common multiple (lcm) when summing or subtracting fractions with different denominators. Subject S1 did selectivity against all the text on problem solving tests, so that the subject S1 failed in the use of mathematical operations to solve the problem. Subject S1 failed in emergence aspects, namely the subject S1 did not do self-reflection to revise the results of thinking. Subject S1 failed in novelty aspect, in which the subject of S1 did reread to discover new things about the text that is not yet understood in their creativity to come up with a comparison between the needs of sugar to make the cake with sugar owned by Adnan's mother.

Researchers obtained the results of the problem-solving for subject S2 that was already experiencing awareness, but she was confused by the results of thinking, how to correct errors of problem-solving tests, so researchers named these conditions with pre-awareness as in Figure 2.

$$\begin{aligned}
 1\frac{1}{3} \text{ kg} + 15 \text{ ons} &= \frac{4}{3} \text{ kg} + 1,5 \text{ kg} \\
 &= \frac{4}{3} + \frac{15}{10} \\
 &= \frac{40}{30} + \frac{45}{30} \\
 &= \frac{85}{30} \\
 2\frac{4}{5} - \frac{85}{30} &= \frac{24}{5} - \frac{85}{30} \\
 &= \frac{144}{30} - \frac{85}{30} \\
 &= \frac{59}{30} // = 1\frac{9}{30} //
 \end{aligned}$$

Ibu Adnan akan membeli logi. Karena gulanya kurang, jadi Ibu Adnan bisa membeli

Figure 2. The result of student's work (subject S2) that experiencing Pre- awareness

Based on the result of the *student's* work that was written by S2, the researcher interviewed the subject S2. Below is the script:

- R : where did you get  $1\frac{1}{3}$  kilos from?  
 S2 : from Adnan's mother's supply.
- R : how can you be inspired by the plus (+) sign?  
 S2 : because grandmother gave her
- R : why didn't you use other operators?  
 S2 : plus (+) sign because we want to know the amount
- R : Why did you add it?  
 S2 : .....
- R : ( $1\frac{1}{3} \text{ kg} + 15 \text{ ons} = \frac{4}{3} \text{ kilos} + 1,5 \text{ kilos}$ ) where did you get  $\frac{4}{3}$  kilos from?  
 S2:  $1\frac{1}{3}$  kilos is formed into common fraction
- R : 1,5 kilo. Why did it become kilos?  
 S2 : .....
- R : How can you get 1,5 kilos?  
 S2 : I made a mistake, forget (in doubt)
- R : ( $\frac{4}{3} \text{ kilos} + 1,5 \text{ kilos} = \frac{4}{3} + \frac{15}{10}$ ) how can you get  $\frac{15}{10}$  ?  
 S2 : from 1.5, there is 1 after the comma, so it's tenth.
- R : Why is it so ( $\frac{4}{3} + \frac{15}{10} = \frac{40}{30} + \frac{45}{30}$ ) ?  
 S1 : to make it it easy in counting the least common multiple  $3 \times 10 = 30$
- R : what does it mean  $2\frac{4}{5} - \frac{45}{30}$  ?

S2 : Finding the left sugar in making the birthday cake.

R : why do you find the rest?

S2 : to know whether Adnan's mother should buy or should not buy more sugar.

R : how much is the need for the cake?

S2 :  $2\frac{4}{5}$  kilos

R : what is  $1\frac{1}{3}$  kilos?

S1 : the sugar supply of Adnan's mother

R : how about 15 ons?

S2 : the sugar from grandmother

R : How much sugar did Adnan's mother have?

S2 :  $\frac{85}{30}$

R : how much sugar is needed to make the cake?

S2 :  $2\frac{4}{5}$  kilos

R : which one is bigger, the sugar need for making the birthday cake or the amount of Adnan's mother's sugar?

S2 : the need for making the birthday cake.

The results of the work and the interview of subject S2 from class 5 SDN Percobaan 2 Malang to solve problems and read the questions included in the category of pre-awareness. Students realize when there is a problem that is readable, but lacking a strategy to fix the problem or fix the confusion. Subject S2 was already doing concentration, mental power (attention) to understand the matter, so that the subject S2 can recognize the problem, namely the decision to buy sugar or not to buy sugar, to know which one is greater between the need sugar to make a cake with the amount of sugar owned by Adnan's mother. Subject S2 can identify the problem and defining the elements of the situation in the problem-solving tests. The work of subject S2 figure out what should be known by declaring the need to make a cake, inventory existing sugar and sugar given by Adnan's grandmother. Subject S2 conducted awareness framework attention, concentration, mental power that is using the sense of sight and thought. Researcher asked the subject, where was S2 inspired by the operator '+' at  $1\frac{1}{3} +$

15 ounces from, subject S2 looked puzzled and replied with a long time "to find out the results."

Subject S2 realized when there was a problem that was read, but did not know how to overcome the confusion to improve understanding. Subject S2 performed equalizing operations in weight unit with a 15-ounce equating to 1.5 kg. When researcher asked why 15 ounces equalized to 1.5 kilos, the subject S2 looked also have doubts with the results of thinking. The process of recall of knowledge had been made by the subject S2, but it was still doubtful with the knowledge already acquired in previous classes of units of weight. Researcher asked  $2\frac{4}{5} - \frac{85}{30}$  "Why minus (-)" Subject S2 answer "to find the rest of the sugar need to make the cake". Subject S2

determined the need to make a birthday cake and the entire amount of sugar owned by Adnan's mother, but the subject S2 still confused how to determine the strategy that is used to determine whether Adnan's mother should buy or not to buy sugar.

Subject S2 did the problem solving test in a supported emotive, because when he did the problem solving tests, he was using the 16-minute time that is relatively longer compared to subject S1. The use of time in solving the problem can be used to indicate the students' mood in solving the problem-solving test. Subject S2, on aspects of architecture was already using previous knowledge in the form of fractional arithmetic operations by using the least common multiple when adding or subtracting fractions with different denominators. Subject S2 was still wrong in changing the mix fraction into common fraction, so that the implementation plan of the solution also failed. Subject S2 had done selectivity against all the text on problem

solving tests, but the subject S2 still had doubts with the word which has implications on the use of mathematical operations to solve the problem.

Subject S2, in the emergence aspects, still did not have self-reflection to revise the results of thinking, so that there was an error in the fractions operation. Subject S2 in the aspect of novelty, reread the test to discover new things about the text that was not understood yet to bring their creativity. Subject S2 made a mistake by subtracting sugar-owned by Adnan's mother on the sugar need to make a cake. Subject S2 did not compare between the sugar need to make a cake with the sugar owned by Adnan's mother.

Researcher found the work of problem solving test for subject S3 that was already aware of what was read in the problem solving test by using a variety of strategies to improve understanding and be able to revise if the error occurred in the result of thinking, so that researcher called this condition as awareness. The work results of student who were already experiencing awareness as shown in Figure 3.

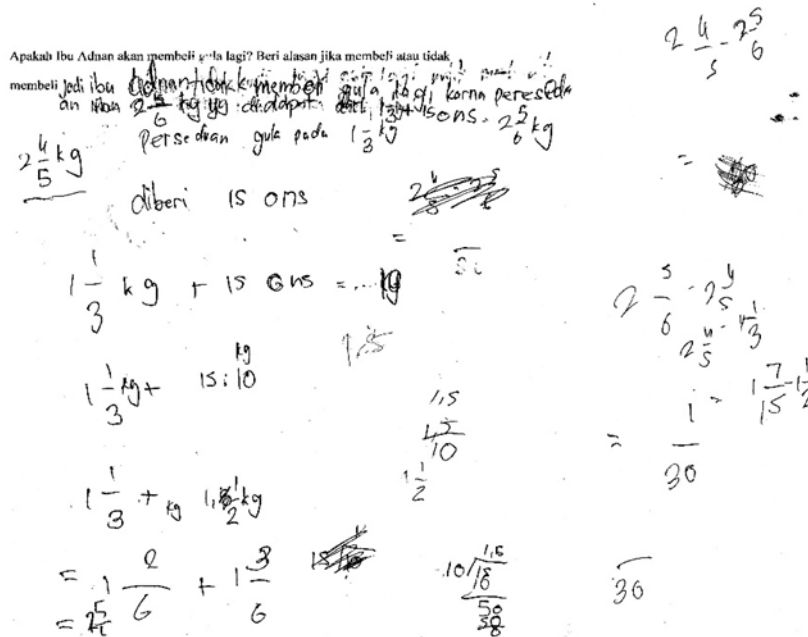


Figure 3. The work of subject S3 that had experienced awareness

Based on the result of the test written by Subject S3, then the researcher interviewed him. The interview script was as follows.

R : what was  $2 \frac{4}{5}$  kilos?

S3 : the sugar need to make the birthday cake.

R : what was  $1 \frac{1}{3}$  kilos?

S3 : the sugar supply of Adnan's mother.

R : where was the "+" sign inspired from?

S3 : because grandmother gave it

R : Why (+) ?

S3 : if it was (-) meant grandmother took it

R : why did you write  $1 \frac{1}{3} + 15 \text{ ons} = \dots$  kilos ?

S3 : because the sugar need was in the kilos measurement unit.

R : Why  $1 \frac{1}{3} + 15 : 10$  ?



S3 : because when we change ons to kilos, we divide it with 10

R : when did you learn weight measurement unit from ons to kilos?

S3 : in grade 4

R : why did you write  $1\frac{2}{6} + 1\frac{3}{6}$  ?

S3 : in equating the denominators from  $(1\frac{1}{3} + 1\frac{1}{2})$  by searching the least common multiple of 2 and 3

R : why did you cross beside the answer?

S3 : Because the division was reserved

R : why did you use the correction pen here

S3 : wrong answer, buying or not buying the sugar

R: Should Adnan's mother buy or not buy the sugar?

S3 : Noot buying the sugar, because  $2\frac{5}{6}$  was greater than  $2\frac{4}{5}$

R: how did you know  $2\frac{5}{6}$  was greater than  $2\frac{4}{5}$  ?

S3 :  $2\frac{5}{6}$  can be subtracted by  $2\frac{4}{5}$  and the rest was  $\frac{1}{30}$

R : what was  $2\frac{5}{6}$  here?

S3 : the result of the addition of Adnan's mother's sugar and the sugar from Adnan's grandmother.

R : what was the conclusion?

S3 : Adnan's mother did not need to buy any sugar because Adnan's mother's sugar and the given sugar from Adnan's grandmother was greater than the sugar need to make the birthday cake.

Subject S3 understood the meaning of each sentence in the problem solving tests. Subject S3 was already aware when there was a problem that was read, using a variety of strategies to improve comprehension of what was read. Subject S3 was already doing mental power concentration (attention) to understand the matter, so as to identify the problem, namely the decision to buy or not to buy sugar to know which one is greater between the sugar need to make a cake with the amount of sugar held by Adnan's mother. Subject S3 can identify the problem by writing the second  $\frac{4}{5}$  kilos of sugar needs to make the cake, write  $1\frac{1}{3}$  kilos of sugar supplies of Adnan's mother and grandmother giving 15 ounces. Subject S3 can define the problem elements on the situation in problem solving test, the overall Adnan's mother's sugar summing ( $1\frac{1}{3}$  ounce +15 kilos) was compared to the needs of the sugar to make a cake. Subject S3 worked on the problems in the emotive which was very supportive (good mood) to resolve the problem solving tests, for he did the problem solving tests using the 30-minute time, relatively longer compared to S2 students. Subject S3 was maintaining the concentration of thinking and arousal passion / child emotion to solve the problem-solving test. Subject S3 conducted awareness wakefulness framework with indicators of the emergence of arousal at the time of doing the problem solving test to obtain a solution. Subject S3 did selectivity against all the text in question, for example, finding an important word in the matter "given by" perception of the subject S3 plus and he said in his imagination that the "taken" meant reduced.

Subject S3 made a change in the weight measurement unit within their information of sugar needs to make a cake in kilos. The process of knowledge recall about the unit of weight made the subject S3 to change 15 ounces to 1.5 kilos by dividing 15 by 10. Subject S3 on aspects of architecture was using previous knowledge in the form of fractional arithmetic operations by using the least common multiple to add fractions with different denominators. Subject S3 was designing and implementing a plan to add mixture fractions by adding the integer part with integer and fractional parts with fractions ( $1\frac{1}{3} + 1\frac{1}{2}$ ). Student reread the question again, trying to find new things that had not been understood or have not been found. In this case the subject has led his creativity to determine whether Adnan's mother should buy or not buy any sugar. Subject S3 tested which one was greater, by reducing the need to make a cake with the number of sugar supply of Adnan's mother and grandmother's. Creative emergence of the subject S3 is a framework of awareness novelty. Students do self-reflection to revise

the results of thinking to do write-off and did tip ex (beside the answer) on a sheet of paper work. Students strike activity, delete, erase using tip ex was framework emergence of awareness. Subject S3 can keep the concentration of thinking to remain the truth result of thinking and revise if something goes was thinking monitoring activities.

#### **IV. Conclusion**

Students' ability in solving the problem is influenced by aspects of awareness that occurs in children. Aspects of awareness that occur will affect students in recognizing the problem. The results of student's work based on think aloud and interview when resolving the problem indicates that students experience a lack of awareness including the tacit reader (students are less aware of how to think when reading). Students experience a lack of awareness, as did the concentration of mental power (attention) to understand the meaning of each sentence in terms of problem-solving tests. Students experienced a lack of awareness for failing to recall knowledge to equate the unit of weight. Students experienced a lack of awareness, failure aspects of architecture, which reconstructed the existing knowledge and learned before.

Students cannot use previous knowledge in the form of fractional arithmetic operations by using the least common multiple when adding or subtracting fractions with different denominators. Students' lack of awareness in doing selectivity against all the text on problem solving tests, so that students experience failure in the use of mathematical operations when they solve the problem.

Students experienced Pre- awareness, realized when there was a problem that was readable, but lacking a strategy to fix the problem or fix the confusion. Students were already doing mental power concentration (attention) to understand the problem, so that students are able to recognize the problem. Pre- awareness of students has been able to identify the problem and define the elements of the situation in the problem-solving test, but still unsure of the outcome of thinking when performing mathematical operations. Pre- awareness students had doubts in doing selectivity against all the text on problem solving tests, such as the subject S2 was still having doubts with the word in the text on problem solving tests with implications for the use of mathematical operations to solve the problem. The process of recall of knowledge already done by the students, but student was still doubting the knowledge already acquired in previous classes about equating the unit of weight measurement.

Analysis of think aloud transcript and interview results of the work of students who have awareness showed that in solving the problem, found some in the process of recognizing the problem, identifying and defining the elements of a given situation in which students need attention aspects of awareness, wakefulness, emotive and selectivity. In representing a problem, students need awareness aspect of knowledge recall. In planning the completion of the problem and how to implement, students need awareness aspect of architecture. In evaluating the results and the answer made, students need aspect of awareness, emergence and novelty.

#### **V. Suggestion**

The awareness components used in this study are interpretive to be implemented in mathematics learning especially in problem solving episodes. This research has been consulted with a psychology lecturer on how implementation of awareness' components can be used in solving problems. In this research the awareness components used in solving the problem are limited to attention, wakefulness, emotive, selectivity, recall knowledge, architecture, emergence, and novelty. With this component limitation researchers can further develop it by adding new components and need input from more psychologists to explore and expand the study so that it can be seen how awareness components can be used in solving problems.

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