Pictorial Of Representation In Solving Word Problems

Fatqurhohman, Cholis Sa'dijah, Sudirman, I Made Sulandra

Abstract: The pictorial of representation in solving word problems in this study is the interpretation of using illustrations of images in solving problems in the form of stories through polya steps. The representation shown by students when the process of understands is done by identifying the problem to find important information on the problem, the process of preparing a plan is shown through translations and conversions of information into the form of picture illustrations, the process of Carry out the plan is done through calculations using reduction operations, the look back process is carried out to check or clarify the results obtained according to the question information. The results of this study found that subject 1 did not complete the polya steps, only identified and devise a plan by picture illustration the accompanied by symbolic descriptions, subject 2 was only inaccurate caused by ignoring the last step which was to look back the results obtained, so that the impact of the image illustration with result of calculations inconsistent or not the same.

Index Terms: pictorial representation, problem solving, word problem, picture ilustrations.

1 INTRODUCTION

One important goals in school mathematics learning is the ability to use representations One important goals in school mathematics learning is the ability to use representations [10]. Some studies related to representation in solving word problems in between is [1; 9; 2]. the use of pictorial representations can reduce problem situations [1]. Junior high school students prefer to use schema solutions than the use of pictorial representations [9]. Pictorial representation is preferred to display many relationships and processes that are difficult to explain, because it can be a learning aid and facilitates problems solving [2]. This study develops one of the problems in the Sanwidi conducted in seventh grade junior high school in Indonesia. In this study, researchers will try to describe the process of pictorial representation in solving word problems using polya steps.

2 THEORETICAL FRAMEWORK

Representation is a form of thought interpretation of a problem [3]. Interpretation as part of a representation that is communicated verbally or in writing [10]. Their interpretative activity is "mediated through physical and bodily resources, ... about visual, spatial modes of symbolic representation" [19], and interpretations can also build interconnections between various representations and make transitions different forms in the problem solving process [4], starting from concrete to visual to abstract [20]. The existences of these representations is interrelated with each other in managing problem information [6], so that the process of selecting representations provides opportunities for students to solve problems [4] Problem solving as an effort to find a way out of difficulties [11].

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Problem solving in the form of word problems is an important component of mathematical problem solving that combines problems and everyday life [9; 7; 12]. The term word problems refers to problems that are presented as meaningful texts or narratives rather than mathematical notations [8], and are relate to situations experienced by students in everyday of life [18]. Word problem is also used to understand the relationship between the situation represented and mathematical operations which then apply it through mathematical operations [1], the process of solving word problems, students are required to translate into concrete forms into abstract or abstract to concrete [9]. Therefore visual representation of images will support discourse in solving students' problems that are display and discusses [10]. In addition, solving word problems is can provide challenges for students in various situations in their solutions requires, in the integration of several cognitive processes that include understanding language and factual information, translating problems with relevant information, compiling and monitoring problem solving plans [17], as well as the use of procedural calculations [fatqurhohman, 2016]. this study is will describe the pictorial representation in junior high school students in solving word problems using steps Polya, (1) understand the problems, (2) devise a plan, (3) Carry out the plan (implementated the plan), (4) looking at back.

3 METHOD

This study uses a qualitative approach with research subjects of 7th grade junior high school students, amounting to 50 students. the researcher taking two student work that represent the use of pictorial representations will be presented as comparisons in process of representation used in problem solving. In addition to the use of questions to see the results of student representation, researcher use structured interviews to explore the process representation that a given.

Supporting instruments (word problem) as follows:
Pada waktu upacara bendera, posisi Dewi, Rahmi, dan Sesil dalam satu barisan. Dewi berada paling depan barisan. Rahmi berada tiga per empat meter di belakang Dewi. Sesil berada seperempat dibelakang Dewi. Berapa meter jarak antara Sesil dengan Rahmi?

In English:
During the flag ceremony, the positions of Dewi, Rahmi, and

Sesil were in one line. Dewi is at the front of the one line. Rahmi is three quarters behind Dewi. Sesil is a quarter behind Dewi. How many meters is the distance between Sesil and Rahmi?

4 RESULT AND DISCUSSION

The results of subject data in solving word problems are explained through polya steps namely Understanding (identifying) the problem, devise a plan, Carry out the plan (implementated the plan), looking at back the results of the solution.

Subject 1

The results of pictorial representation in solving word problems a subject 1 are shown in Figure 1

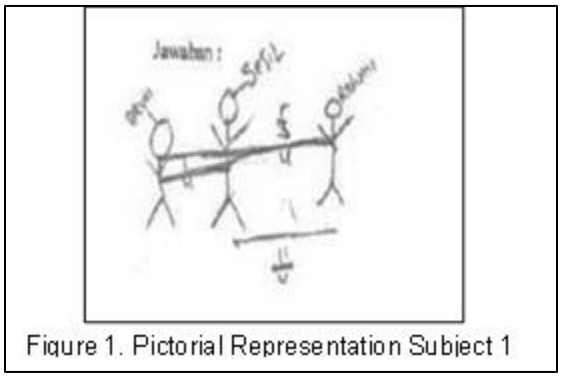

Figure 1. Pictorial Representation Subject 1

Based on result of figure 1. Steps to understand a problems that is done by the subject by identifying all the data information about the problem and write it in the form of picture illustrations. Understanding the problem must be able to identify the problem by connecting all the information data to the problems [14]. The relationship in question is written in the picture illustrations of the positions of Dewi, Sesil and Rahmi. Students have difficulty understanding the problem will affect the problem solving process, because understanding the problems be the main point of finding information contained in the problem [13]. The steps of devise a plan undertaken by subject 1 are making of picture illustrations with each student's position. Illustrations made by the subject based on the relationship between information a problems as a first step to obtain solutions. The planning action was carried out with various calculations and other operations the raised [14]. However, from the results of the answer subject 1, the calculation process is nothing raised. to trace the results of the answers subject's 1, the researcher traces the following structured interview footage (R is a researcher and S1 is the first subject).

R : Based on this problem, what information did you get?

S1 : The position of Dewi, Sesil, and Rahmi in one line. Sesil $\frac{1}{4}$meter behind Dewi. Rahmi $\frac{3}{4}$ meter behind Dewi

R : Is there any other important information contained in the problems?

S1 : Yes, determine the distance between Sesil and Rahmi

R : (pointing to the picture) Try to see, is the distance Sesil-Rahmi $\frac{3}{4}$ meter? How do you get it!

S1 : (Shows picture) oh yes I wrote it wrong, that means the distance of $\frac{3}{4}$ meter is the distance of the Dewi-Rahmi

R : How do you know their position?

S1 : From information it, the position of Dewi-Sesil is $\frac{1}{4}$ meter and Dewi-Rahmi is $\frac{3}{4}$ meter. my understanding is because $\frac{3}{4}$ is bigger than $\frac{1}{4}$, then Sesil between Dewi and Rahmi, and Rahmi position behind Sesil

R : (pointing to picture) How many meters is Sesil-Rahmi

S1 : Distance Sesil-Rahmi is $\frac{3}{4}-\frac{1}{4}=\frac{2}{4}$ meter.

Based on interviews conducted with the subject, the researcher found that the subject did not completed and checked again (looking at back) after Carry out the plan (implementated the plan) that consequently the distance of Sesil-Rahmi's position on the illustration illustration was not right. This subject 1 is not careful in writing or interpreting his thoughts.

Subject 2

The results of pictorial representation in solving word problems a subject 2 are shown in Figure 2

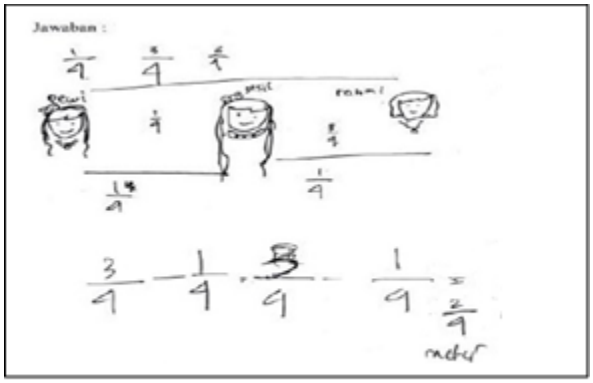

Figure 2. Pictorial Representation

Based on result of figure 2. The steps to understand the problem and devise a plan for solving subject 1 and subject 2 have a similarity, namely identifying a data information the problem and connecting it, which one a written in the form of illustrations of the positions of Dewi, Sesil and Rahmi. In other words, the subject translates the information a problem and describes it in the illustration of the picture. on steps carry out a plan of completion, subject 2 makes calculations to determine the distance Sesil-Rahmi. The calculation process uses the operation of subtractions the distance between of Dewi-Rahmi with Dewi-Sesil to determine the distance of Sesil-Rahmi is $\frac{3}{4}-\frac{1}{4}=\frac{2}{4}$. From results it, it is clear that subject 2 also did not re-check (look at back) it like subject 1, because it made a misconseptions writing distance Sesil-Rahmi $\frac{1}{4}$ in the picture illustrations, the impact of the answers the subject 2 of represented is not quite right. In carrying out a settlement plan, an ability to see the relationship between information data and the problem being sought is needed, as well as experience will affect the smooth planning. The results of the subjects' answers were traced by the researchers through the following traces of structured interview records. (R is a researcher and S2 is the second subject).

R : Based on this problem, what information did you get?

S2 : The position of Dewi, Sesil, and Rahmi in one line. Sesil $\frac{1}{4}$ meter behind Dewi. Rahmi $\frac{3}{4}$ meter behind Dewi

R : Is there any other important information contained in the problem?

S2 : Yes, determine the distance between Sesil and Rahmi.

R : How do you determine the distance between Sesil and Rahmi?

S2 : (Shows pictures of the position of Dewi, Sesil, and Rahmi). First, because $\frac{3}{4}$ is bigger than of $\frac{1}{4}$, then Sesil between Dewi and Rahmi, and Rahmi position behind Sesil. Second, I reduce the distance of Rahmi-Dewi with Sesil-Dewi which is $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$ meter

R : (pointing to the picture) Try to see, is the distance Sesil-Rahmi $\frac{3}{4}$ meter? How do you get it ?

S2 : (Shows picture) oh yes I wrote it wrong, that means the distance of $\frac{3}{4}$ meter is the distance of the Dewi-Rahmi and the Sesil-Rahmi distance is obtained by reducing the distance of Dewi-Sesil to Dewi-Rahmi distance.

R : (pointing to picture) How many meters is the distance it ?

S2 : Oh yes, I wrote it wrong again. Actually, distance of Sesil-Rahmi is $\frac{1}{2}$ meter

R : Are you sure?

S2 : My opinion is like that.

Based on interviews conducted with the subject, the researcher found that the subject did not re-check (look at back) after devise a plan that consequently the relationship between the illustrations of image with the calculation was not the same. This can be seen from the answer sheet and the conversation during the interviews. From the answers obtained by researchers, most students set aside at the stage of checking the results (look at back) because they are felt that what was done its was correct. The act of checking back or clarification is very necessary in the process of problem solving [16], and allows for increased knowledge and increased problem solving skills [15]. Therefore, this step can be the basis for strengthening knowledge and convincing the truth of the results obtained.

5 CONCLUSION

If you are using Word, use either the Microsoft Equation The pictorial representation process in solving word problems in this study is the interpretation of using illustrations of images in solving problems in the form of stories through polya steps. the pictorial representations that shown by students are beginning from the process of understand the through identification of problems to find important information, the process of devise a plans a showed students through translations and alterations of information obtained from understand the problems (identification), the process of carrying out the plan is done through calculations using subtraction operations, the re-checking process (look at back) necessarily used to check / clarify the results obtained in accordance with the question informations. based on of polya steps, subject 1 did not complete, namely identifying and devise a plans by picture illustrations the accompanied by a numeric symbol description, while subject 2 was only inaccurate by ignoring the final step of the polya ie checking the results (look at back) obtained. So that the illustration of the image with the result of calculation is inconsistent or not the same.

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