

Profile of High Order Thinking Skill (HOTS) of Junior High School Students' Grade 8 in Solving Linear Equation System Problems Based on Kinesthetic and Visual Learning Styles

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ABSTRACT

This qualitative research aims to describe profile high order thinking skill (HOTS) of Junior high school students' grade 8 in solving linear equation system problems based on kinesthetic and visual learning styles. In collecting data, mathematics ability test and learning style questionnaire aims to select students to be research subjects. Then, problem solving tests to determine the high order thinking skills and interviews were used to obtain data on students' high order thinking skills that were not obtained from problem solving tests. There are 3 (three) aspects of HOTS in this study which are analyzing, evaluating and creating. The results of the study show that in the aspect of analyzing, students with kinesthetic and visual learning styles can distinguish the information needed, know what is sought and know the relationship between information. In creating aspect, kinesthetic and visual aspects can know ideas, strategies used and can implement these ideas and strategies in solving problems. Whereas in the Evaluation aspect, kinesthetic uses a strategy in checking the truth in the answer but the visual does not use the strategy. Thus, it can be concluded that the differences of kinesthetic students and visual students lay on strategies used in checking the truth of the answers of the problem given.

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1. INTRODUCTION.

High Order Thinking is a process of thinking with students having to understand the meaning of information by changing their minds, explaining principles and rules, knowing relationships between ideas, grouping and analyzing, therefore individuals judge and decide to combine and design new ideas (Tajudin, Puteh, & Adnan, 2017; Fitriana, 2019; Pratiwi, 2019). Samo, Darhim & Kartasasmita (2017) the importance of implementing HOTS was to encourage students to have knowledge in their longterm and to build quality students. Therefore, the Government hopes that students will be able to hone their high order thinking skills, this can be seen in the decision of the Minister of National Education Number 21 Year 2016 on the contents of Primary and Secondary Education Standards which states that students must be equipped with critical, creative, logical and analytical thinking skills on math subjects. But in practice only a few teachers applied the mathematics learning system in HOTS-based schools (Apino, E & Retnawati, H, 2017). The teacher only emphasizes conceptual mastery of the material and the lack of attention to increasing students' high order thinking even on daily exams and final examinations only emphasizes cognitive at a low level [9]. The low level of HOTS Indonesia can also be seen in the Program for International Student Assessment (PISA) for the junior high school level, namely Indonesia is ranked the bottom 9 or

ranked 64 of 72 countries with a score of 386 [8]. Based on these problems it is known that the learning system in the classroom using HOTS problems is still small and Indonesia's achievements in mathematics at the international level are still low.

Samo, Darhim & Kartasasmita (2017) state that the low level of HOTS of students are inseparable from the principle of HOT itself which is not just memorization but thinking to a higher level, so that in its application HOTS is indeed not easy and requires a lot of time (Shukla, 2016). Nevertheless individuals who are trained to manage High Order Thinking Skills show a positive impact in improving learning performance and in developing their education (Tajudin, Puteh, & Adnan, 2017; Yuliami *et al*, 2019).

In the revision of the Bloom Taxonomy there are aspects of low and high level thinking. Low level thinking contained remember, understanding and apply. While analyze, create and evaluate are High Order Thinking (Anderson, 2001, Brookhart, 2010, Chao, 2018, Krathwohl, 2002, Mccurry, 2014, Tanujaya 2017; Rahayu, 2018). The three aspects of high order thinking, Anderson and Krathwohl (2001) divide them into indicators where they are often used as a basis for measuring high order thinking of students, namely Analyzing consists of several categories which include differentiating, organizing and attributing. while creating consists of

generating, planning and producing. and to evaluate include checking and critiquing.

2. RESEARCH METHOD

This study uses qualitative research. In collecting data there are 4 techniques used. First, giving learning style questionnaire. Second, the mathematics ability test aims to select students who have similar mathematics ability to be selected as research subjects, the subjects of this study are two junior high school students of grade 8 including 1 student who has a kinesthetic learning style and 1 student has a visual learning style. Third, problem solving tests to determine the high order thinking skills. And fourth, interviews were used to obtain data on students' HOTS that were not obtained from problem solving tests.

3. RESULTS AND DISCUSSION

In this study, to find out the high order thinking skills of students, students must have the aspects of analyzing, creating, and evaluating. The research subjects were 1 student who had a kinesthetic learning style and 1 student had a visual learning style obtained from the results of a mathematical ability test. Whereas in expressing students' high-order thinking skills, problem-solving tests and interviews were used, along with the results obtained from the two techniques.

3.1. Analyzing Aspects of Kinesthetic subject

The first step performed by kinesthetic subjects is to write down information that is known to include the information needed and that is not needed. From this step, the subject can distinguish the information needed and those who do not answer the question. Because the information needed is used to determine the unit price of shoes.

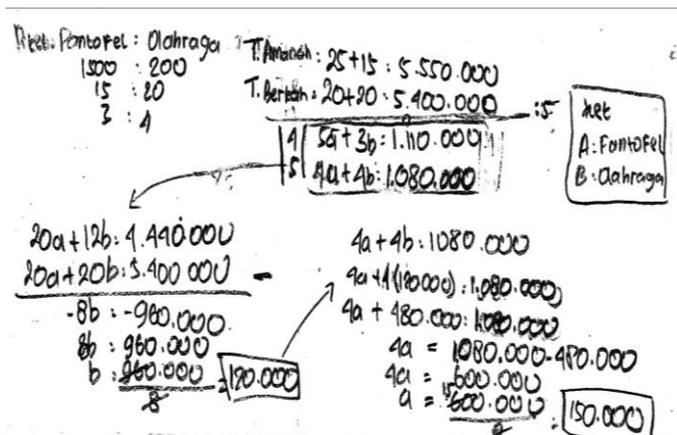


Figure 1. Kinesthetic Subject Answers

From the interviews conducted, the subject explained the essence of the problem (attributing), namely finding the unit price of the shoe and then determining the costs incurred and the bonus obtained by the Ketintang Shop. In addition, the subject also said that every information on the question is interconnected (organizing), that is, the information needed is used to find the unit price of shoes and then determine the costs incurred.

3.2. Analyzing Aspects of Visual Subject

The first step that is done by visual subjects is to write down

the information needed only in determining the unit price of shoes. From this step, the visual subject can distinguish the information needed and that is not needed in answering the question

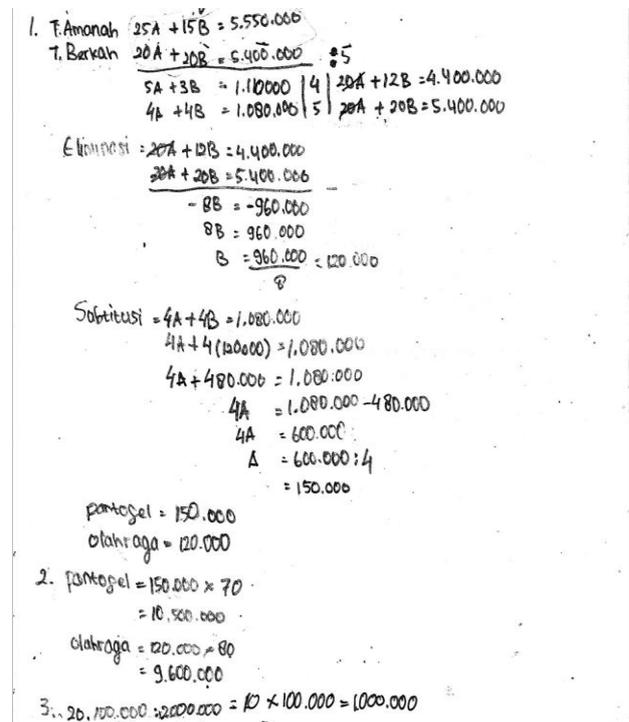


Figure 2. Answers of Visual Subjects

During the interview, the subject could mention the question of the problem (attributing). In addition, the subject also said that any information that is known to be interconnected (organizing) where the information needed is used to find the unit price of shoes.

3.3. Creating Aspect of Kinesthetic subject

On the results of interviews, kinesthetic subjects know the material or idea that is used in solving problems, namely the system of linear variables of two variables but the subject does not know the reason why to use the idea. Nevertheless, kinesthetic subjects can find out the strategies used (planning), namely elimination and substitution. It can be seen from Figure 1, the steps used by the subject first (producing), which are the example of the variable then the subject eliminates the variable, after being eliminated the next step is substitution.

3.4. Creating Aspect of Visual Subject

On the results of interviews, visual subjects know the material or idea that is used in solving problems, namely the system of linear variables of two variables. Besides the subject also knows the reason for using the idea, the subject said that the question uses two variables, namely a and b or loafers and sports shoes. Furthermore, the subject suggests that the strategy used (planning) in solving problems is elimination and substitution. In implementing (producing), the visual subject first specifies the variable then eliminates the variable, after eliminating the next step is substitution. This step is seen in Figure 2.

3.5. Evaluate Aspect of Kinesthetic subject

The kinesthetic subject says that the answer to the problem given is correct, it can be seen at the interview the subject checks

(checking). Kinesthetic subjects say if the strategy used to find out the truth of the answer (critiquing) is by substitution.

3.6. Evaluate Aspect of Visual Subject

On the results of the interview, the subject visually explained the way in checking the truth (checking) the answer by looking at the steps to solve the problem that had been done, and the subject also counted from the beginning again with

using substitution strategies and elimination (critiquing), meaning that the subject does not use other strategies in checking the correctness of the answer.

4. CONCLUSION AND DISCUSSION

Based on the results that have been obtained, visual subject have fulfilled all three aspects, namely analyzing, creating and evaluating. Visual subject has good ability to answer mathematics question specially about visual things and image (Tonra, W.S, 2018). However there are very prominent differences in the evaluate stage with kinesthetics who students use other strategies in checking the truth of the answers but visual students cannot do it. This shows that learning styles are very influential in the high order thinking process of students. The Achievement of high order thinking skills of students is influenced by several factors including processes and conditions. The conditions consist of three variables, namely the goal of achievement in the field of study, constraints and characteristics of the field of study, and the characteristics of students. One of the characteristics of the student is the learning style.

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