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Conference Paper

Analysis of Mathematics Literation Capability in Cube and Beam Materials on Mts Students Reviewed from Dependent and Independent Field Kognitiffield Style

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Abstract

This research is a descriptive qualitative research which aims to describe the mathematical literacy skills of the material of cubes and beams of class VIII A students at MTsN 2 Indramayu that it be seen in terms of cognitive styles of dependent fields and independent fields. Data will be whereas to describe the ability of mathematical literacy using observation; interview test; documentation. Data from this study were analyzed using Miles and Huberman (2007) data analysis which consisted of data reduction, data presentation, and conclusion drawing. The results of this study indicate that students in the Field Dependent cognitive style use the concept and the steps of the test work are still not appropriate. While students in Field Independent cognitive style use the right concepts and work steps. The advice given is that the teacher should provide balanced proportions in giving individual and group assignments to students (more conical).

Keywords: Mathematical literacy ability, Field Dependent, Field Independent.

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1. Introduction

Learning mathematics for students is the formation of a mindset in understanding an understanding or definition. In learning mathematics, students are directed to gain an understanding of the practices carried out in these activities so that they are able to process information. The mathematics learning certainly has a goal to be achieved. The purpose of learning mathematics itself is so that students can understand the concept and be aware of the importance of applying the concept in life (Akramunnisa, et al., 2017: 16). There are several mathematical abilities that students must have to understand mathematics (Abdussakir, 2018), one of which is mathematical literacy.

Each student has a difference in solving a problem. This difference is possible because of differences in student characteristics so that it also influences the way of thinking. These differences are often referred to as cognitive styles (cognitive styles).

According to Hansen (in Yahya, A: 2015), cognitive style in general can be described as the way in which information is obtained and processed. In addition, psychologists also argue that differences in student characteristics can affect student learning outcomes in school. According to Witkin (1977: 2), the cognitive style is divided into two parts, namely the cognitive style of Field Dependent and Field Independent.

Students are said to belong to the Independent Field cognitive style, ie students are analytical in nature, namely students who feel the environment into its components, are less dependent on the environment or less influenced by the environment. While students who are cognitive style Field Dependent are individuals who focus on the overall environment, dominated or influenced by the environment. However, according to Wulandari, R. (2017: 97) with the grouping of cognitive styles does not mean that one can compare cognitive styles better with other cognitive styles. It's just that, with the grouping of cognitive styles we can find out the difference between the two ways of thinking.

Based on the results of the Trends in the International Mathematic and Science Study (TIMSS), Indonesian students in 2007 had a math score of 397 (pusdendik Kemdikbud, 2017), in 2015 had a math score of 386 (puspendik Kemdikbud, 2017), and in 2015 had math score of 397 (puspendik Kemdikbud, 2017). In addition, the results of the Program for International Students Assessment (PISA), Indonesian students in 2009 had a math score of 371 (Walker, M. 2011: 42), in 2012 had a math score of 375 (Gurria, A. 2012: 5), and in 2015 had a math score of 386 (Gurria, A. 2018: 5).

The researcher obtained the results of the national exam scores in the last three years which were obtained from the profile of the school in Indramayu 2 MTs in which the results of the exam scores in the past three years were included. The percentage of mathematical exam results data in the last three years in a row, namely in 2014/2015 with the number of examinees 121 people having an average of 49.8%, then in 2015/2016 with the number of examinees 142 people having an average of 51, 6%, besides that in 2016/2017 with the number of exam participants 148 people had an average of 55% (TU MTs Negeri 2 Indramayu, 2018). Thus it is clear that there are different mathematical literacy abilities of students each year. The researcher also interviewed the mathematics teacher about the students 'mathematical literacy in this school, and the point was that the students' mathematical literacy in this school was quite good. It's just that every student has the ability to understand differently, this is due to different characteristics of students.

2. Research Methods

Based on the problems studied, this type of research can be classified into a type of qualitative research. According to Moleong, L.J. (2012: 6), qualitative research is research that intends to understand the phenomenon of what is experienced by the subject in description in the form of words and language, in a specific natural context and by using various natural methods. This research was conducted at Indramayu 2 MTs. Determination of research subjects is by carrying out the GEFT cognitive style test. The GEFT test is carried out in class VIII A which is the superior class in the school. From the results of these tests, students who have the strongest tendency towards each type of cognitive style are selected. So that there were four research subjects consisting of two Field Dependent students and two Field Independent students. In this study, researchers used data collection techniques by means of observation, tests, interviews, and documentation.

The test instrument used was the Group Embedded Figure Test (GEFT) and a mathematical literacy ability test instrument. GEFT instruments consist of 3 parts with a total of 25 questions. The first part of the GEFT test consists of 7 questions, while the second part of the GEFT test and the third part of the GEFT test consist of 9 questions. The first part is the exercise while the score is calculated from the second part of the GEFT test and the third part of the GEFT test. Time to do the GEFT test is 20 minutes. The score on the second part of the GEFT test and the third part of the GEFT test, for each correct answer is given a value of 1 and the answer is wrong 0. Then the GEFT second part score test and the third part of the GEFT test are added. If the final score is in the range 0-11, the student has the cognitive style of the Dependent Field. Whereas if the final score is in the range of 12-18, the student has the cognitive style of the Field Independent.

Furthermore, the four research subjects were given 5 test questions of mathematical literacy abilities of the volume and surface area of cubes and beams that had been tested in class IX A. After that the researchers interviewed the four subjects of the study. The timing of the implementation of mathematical literacy ability tests and interviews is conducted at different times so that there is no possibility of similarity in the answers to the test or deliberate interviews. The instrument in this study was made by observing mathematical literacy indicators. There are only 5 indicators from 7 indicators of the existing problem, namely being able to design strategies for solving problems, using mathematics to solve problems faced, can communicate, mathematical, representation, devising strategies for solving problems and using mathematical tools.

3. Results and Discussion

The following will describe the results of the overall research obtained through observation, tests, interviews, and documentation based on three indicators by describing the students' Field Dependent and Field Independent students.

3.1. Description of students' mathematical literacy capabilities in the cognitive field dependent

Answer sheet Student FD 1

Answer sheet Student FD 2

Field Dependent students are less able to design strategies to solve problems when working on problem number two. Field Dependent students are less able to use mathematics to solve problems faced, so Field Dependent students are less able to develop the concepts they have. This statement is in line with the results of Musyarofah's research, A.H. (2014) that Field Dependent students tend to stop and not find ideas to solve problems.

Answer sheet Student FD 2

Answer sheet Student FD 1

Field Dependent students can communicate, mathematical, representation, devising strategies for solving problems and using mathematical tools when working on questions number 1, 3, and 4. From the results of the study, it can be seen that the Field Dependent students make the final mistake. Both groups of students are able to determine the value that is known and asked. However, Field Dependent students experience errors due to lack of concentration, lack of confidence in the concepts they have, and weakness when filtering information obtained, so that it is easily affected by the surrounding environment. This statement is in line with the results of Wardana's research, R.P. (2018) that Field Dependent students have more difficulty concentrating on learning because Field Dependent students are strongly influenced by the environment. The results of the study are also in line with the opinions of Riding and Cheema (Guisande, A. et all., 2007) which defines that individuals with the Field Dependent's cognitive style have difficulty in separating information coming from the surrounding environment and are more easily influenced by external factors, thus becoming less selective in absorbing information.
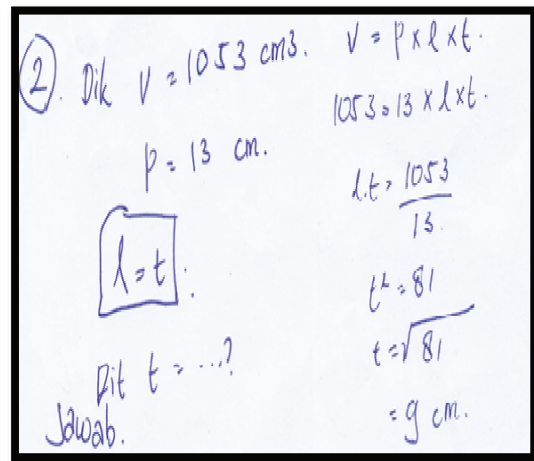
Answer sheet Student FD 1

Answer sheet Student FD 2

Field Dependent students are less able to reasoning and argument when working on question number 5. Field Dependent students are less able to associate material concepts with concepts in real life, unable to think complexly, students tend to think globally, less able to analyze well, so the answer to the number questions 5 that was done by the Field Dependent students was still not right. The statement is in line with the results of Witkin's research, H.A (1977) which shows that students with Field Dependent's cognitive style have a tendency to think globally.

## 3.2. Description of students' mathematical literacy capabilities in the field of cognitive independent
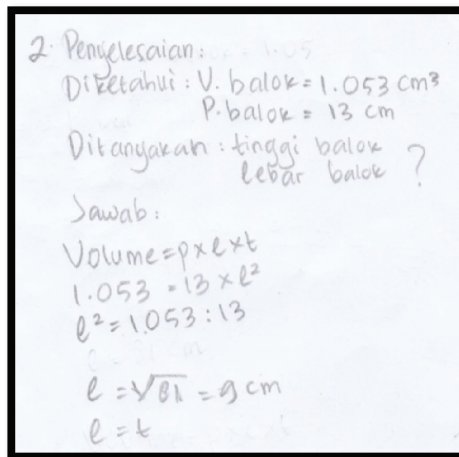
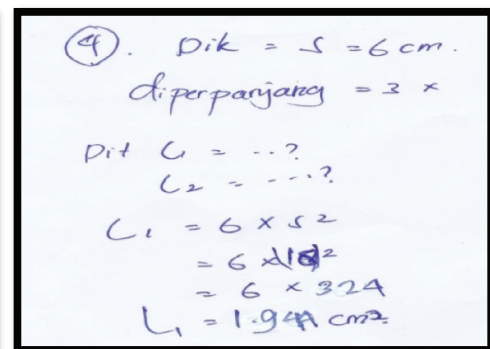**Answer sheet Student FI1**

Answer sheet Student FI2

Field Independent students are able to design strategies to solve problems when working on question number 2. Field Independent students can find a solution after remembering the concept and can develop the concept they have. This statement is in line with the results of Musyarofah's research, A.H. (2014) that Field Independent students tend to pause and remember mathematical concepts or materials related to the problem. So that in the end students can find a solution to the problem.
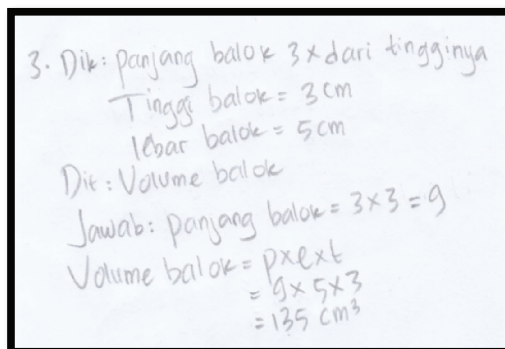
Answer sheet Student FI 2

Answer sheet Student FI 1

Field Independent students can communicate, mathematical, representation, devising strategies for solving problems and using mathematical tools found in questions number 1, 3, and 4. Field Independent students can easily process the information in the problem, filter out existing information, and can associate concepts between concepts into questions without having confidence in yourself without being affected

by others. This statement is in line with the opinion of Riding and Cheema (Guisande, A, et all., 2007) which defines that individuals with Field Independent cognitive style are easier to separate incoming information and are more easily influenced by internal factors, so that it is more selective in absorbing information.

Answer sheet Student FI 1

Answer sheet Student FI2

Independent Field Students are capable of reasoning and arguments found in question number 5. Problem number 5 is the hardest question among the other questions. Although it is quite difficult, students can solve question number 5 correctly. Field Independent students analyze question number 5 and conduct experiments so that the experiment can produce the right answer. Thus, Field Independent students have good analytical skills. The statement is in line with the results of Witkin's research, H.A. (1977) which showed that students with the Field Independent cognitive style were able to use their analysis well.

4. Conclusion

Based on the research that has been done, conclusions can be taken as follows:

1. Students Field Dependent resolves the problems of the five questions with two indicators of mathematical literacy abilities using concepts and steps that are still inadequate, resulting in no maximum answers.

2. Field Independent students are able to solve the five problems of the problem with seven indicators of mathematical literacy skills using the concepts and the right workmanship steps to produce maximum answers.

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