THE CHARACTERISTICS OF VISUAL TYPE LEARNING STYLE IN SOLVING MATHEMATICAL PROBLEMS

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ABSTRACT

This research aim to determine learning style characteristics of visual type in solving mathematical problems. This research method is qualitative. The subject of this research are students of class VII B MTs Padureso Kebumen in academic year 2016/2017. Subject selection using questionnaire and observation for learning style. Subjects taken as many as 3 students who have a visual learning style. Data collection uses problem solving skill test, questionner, field note, interview, and observation. Data analysis techniques used data reduction, presentation of data, and conclusions. The results of this research indicate that learning style characteristics of visual type in solving mathematical problems are: visual students prefer written instructions rather than listening, visual students prefer to imitate something ever seen before, have difficulty in expressing mathematical ideas, prefer to use images in solving problems, often wrong in calculation the number operations.

Keywords: Visual Learning Style, Problem Solving

Introduction

Learning in mathematics can be presented in the form of mathematics problems. Mathematics problems is given to students as an evaluation tool to measure the ability of students after receiving a studies. Problem solving is important in the purpose of learning mathematics, because in everyday life people are never out of problems. Hartono (2014) mentions that problem solving is part of a very important mathematical curriculum. This is because students will gain experience in using the knowledge and skills they have to solve problems not routine.

The ability to mathematics problem solving each student's different. Can be seen when the learning process there are the students who speak themselves, there is a attention, and there is a daydreaming. In this case problem solving is influenced by the level of student concentration during the learning process. Peker (Rofiqoh et al., 2016) suggests that classroom learning is heavily influenced by factors such as learning styles, mathematical anxiety, lack of self-confidence, teacher confidence, environment, lack of parental attention, and gender. The result of Dewi et al (2013) study on students who have a type of visual learning style that at the step of understanding the problem,

the subject can mention what is known and asked in problem solving task, and also know the truth of the problem given. But in another aspect the students still have shortcomings in solving the problem.

Dewi et al research results on the students who have a type of visual learning style is known that not all students are able to solving mathematics problems correctly. According to DePorter & Hernacki (1999) that visual learners are more dominant learn by what they see. Although in the classroom there are three types of learning styles, each student will be more likely to be one type only among the three.

Some prominent features in students of visual type are they speak quickly, thoroughly and detailly, remember what is seen rather than being heard, and are usually not disturbed by the commotion. Visual learning style is very often found in junior and senior high school students. At the time of learning process junior and high school students more often talk with fellow friends. However, students with visual learning style are not disturbed by the commotion and still pay attention to the teacher when learning takes place. As a result there are only a few students who are able to understand the lesson presented by teacher. From these review, researchers suspect most students in classroom include the category of visual type.

The results above do not know the characteristics of visual learning style of students in solving mathematics problems. Each student has different characteristics especially in his learning style. Sari (2014) says that every child born has different brainpower characteristics in absorbing, processing, and conveying information. Similarly, students who have a visual learning style can be known characteristics in solving mathematics problems. So the purpose of this study is to know the characteristics of visual type learning style in solving mathematics problems.

Visual Learning Style

Learning styles are an approach that explains how individuals learn or how individuals work to concentrate on processes, and getting new information through different perceptions (Ghufron & Risnawati, 2012). Another opinion by DePorter & Hernacki (1999) says that learning styles are a combination of how individuals absorb, and then organize and process information. James & Gardner (Ghufron & Risnawati, 2012) argue that learning styles are a complex way in which students perceive and feel most effective and efficient at processing, storing, and recalling what they have learned. From some of the above opinion can be concluded that learning style is the

way taken by individual (student) in collecting and getting new information during learning process.

DePorter & Hernacki (Halim, 2012) explains that visual learning style are people who learn more closely with traits like doodling while talking on the phone, talking quickly and prefer seeing maps rather than hearing explanations. People who have a visual learning style, learn by focusing the visual acuity. Empirical evidence must be shown first so they understand. According to Gilakjani (2012) "Visual learners think in pictures and learn best in visual images. They depend on the instructor's or facilitator's non-verbal cues such as body language to help with understanding. Sometimes, visual learners favoursitting in the front of the classroom. They also take descriptive notes over the material being presented". While Halim (2012) says that visual type students have a tendency to absorb more information maximally through the sense of sight. It can be concluded that visual type are students whose learning is easier to understand from what they see than heard.

DePorter & Hernacki (1999) states that the traits of individuals who have visual type learning styles are:

a. neat and orderly
b. talking quickly
c. planners and long-term regulators
d. meticulous to detail
e. emphasize the appearance, both in terms of clothing and presentation
f. spellers are good and can see the actual words in their minds
g. remembering what is seen, rather than being heard
h. remember with visual associations
i. usually not bothered by the commotion
j. have problems remembering verbal instructions unless they are written, and often ask people to help repeat them
k. reader fast and diligent
l. prefer reading rather than read
m. requires a thorough and guarded view and goal before being mentally sure about a problem or project
n. scribbling meaninglessly while talking on the phone and in meetings
o. forgot to convey verbal messages to others
p. often answer questions with short answers yes or no
q. prefers to do demonstrations rather than make speeches
r. prefer art to music
s. often knowing what to say, but not choosing words
t. sometimes lose concentration when they want to pay attention.

Students who have visual type learning styles tend to be neat and organized, as well as meticulous in capturing information in detail. Visual students almost always make notes of what they learn, or what they want to remember. When the teacher takes notes on the board, the visual type student copies the notes neatly in his book.

Sometimes he can ask his teacher to draw things that will make it easier to understand the subject lesson. When given the video display, it will be very careful in observing the information contained in it.

Wassahua (2016) says that there are some characteristics that are typical for people's visual learning style. First, the need to see something (information/lessons) visually to know or to understand it; secondly, having sufficient understanding of the artistic problem (storing/having artistic value); third, having difficulty in direct dialogue; fourthly, it is difficult to follow verbal recommendations; fifth, often misinterpret words or speech. Given these characteristics can know whether the student is included into the visual learning style or not. In this study, learning styles studied in students are limited to visual learning styles. Researchers can know the characteristics of visual learning styles in solving mathematical problems by analyzing more detail characteristics of visual learning styles delivered by Wassahua especially on learning mathematics.

Research methods

The method used in this research is qualitative research method. The type of this research is phenomenology research. Moleong (2010) defines phenomenology as a subjective experience or phenomenological experience and a study of consciousness from a fundamental perspective of a person. The study was conducted in October 2016 - August 2017 at MTs Padureso, Kebumen. Subject taking using purposive sampling technique. Sugiyono (2015) revealed that purposive sampling is a sampling technique or subject with certain considerations. Eligible subjects may reveal the above so that the data may be obtained as follows:

a. Involved in the process of learning to teach mathematics in the classroom

b. Students who have visual type learning styles.

The instruments used consist of main instrument and supporting instruments. The main instrument is the researcher itself, while the supporting instruments are observation sheet, questionnaire, test questions, interview guides and documentation. Questionnaires are performed to obtain efficient data or results to know students who have visual type learning styles. Interview conducted to know the things of respondents in more detail and depth. Test questions was done to obtain data about the characteristics of visual type learning in solving mathematical problems. While data analysis techniques used refers to Miles & Huberman model (Sugiyono, 2014), namely: (1) data reduction that is selecting data required by the researcher, (2) display data, (3) conclusion drawing/verification.

Research Result and Discussion

In this studied, the researcher take 9 candidate subject which have visual type learning style that is student with initials AL, AY, CN, II, DD, IV, OD, RN, and RR. The recruitment of candidates for this subject is based on a questionnaire previously given to students at MTs Padureso Kebumen. From 9 candidate subjects taken, there are 5 candidate subjects who show saturation of data because it has an identical answer. The five candidate subjects are AY, II, IV, OD, and RR. Of the five candidate subjects who have visual learning styles, researcher only take 3 subjects namely IV, AY, and II, because the three subjects are already representing the five candidates to obtain the characteristics of visual learning style students in solving mathematical problems.

Further data analysis is done to find out the characteristics of visual type learning style in solving mathematical problems. This section discusses 3 subjects who have visual learning styles namely IV as the first visual subject (SV1), AY as the second visual subject (SV2), and II as the third visual subject (SV3). Observation of a subjects that has a visual learning style is done by giving a problem to the subjects. The problem to be given to the subjects can be seen in the following figure.

Question

What is the value of x in the image below?
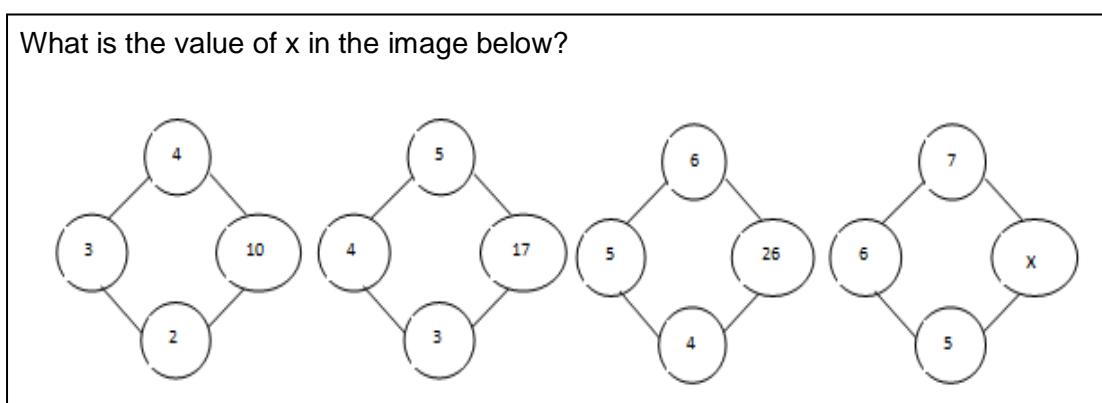
Picture 1. Problem Given To Subject

In solving the problem to find an unknown value in an integer operation presented in the above image, SV1, SV2, and SV3 are able to solve it correctly. But when done it the three subjects only focused on the image that has the element x only without seeing the image that is beside it. When starting to work, the three subjects read it over and over until they really understand and prefer written or verbal instruction. Here's an excerpt from an interview with the subject.

R : "Do you prefer written or verbal instruction?"
SV: "written"
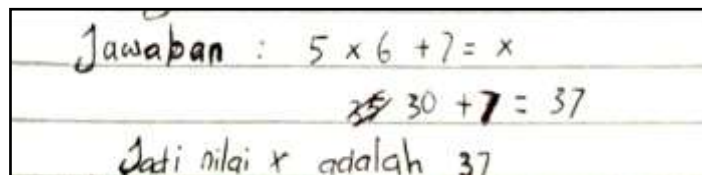R : "why?"
SV: "I find it easier to remember"

R : "how do you understand the problem?"
SV: "I see the problem, until I really understand"
R : "Are you having trouble understanding the problem?"
SV: "no"
R : "do you write what is known, asked and answered?"
SV: "yes"
R : "do you have trouble doing it?"
SV: "there is, a little".

This is in accordance with the opinion of DePorter & Hernacki (1999) who says that visual people have problems remembering verbal instruction unless they are written, and often asking people for help to repeat them. So it can be said that the three subjects who have a visual learning style prefer written instruction because they remember the information read. Agree with Halim (2012) that visual type students have a tendency to absorb more information maximally through the sense of sight.

Furthermore, in solving the problem above the three subjects using the way ever taught by his teacher. This is in accordance with the opinion of DePorter & Hernacki (1999) which says that people visually recall from what is seen rather than being heard and remembered by visual association. So the three subjects are easier to remember something he has ever seen. When the teacher explains on the board in writing on how to solve problems in mathematics makes visual students easier to remember. Then the three subjects use the same way as his teacher taught to solve the above problem. Here's an excerpt from the interview.

R : "What part are you having trouble with?"
SV: "part of the calculation"
R : "Did you finish it your own way or have you ever taught the teacher?"
SV: "ever taught the teacher ".

Seen the three subjects have difficulty completing in expressing mathematical ideas. When interview, the subject only answers with short sentences and the results of his work show short answers or use very simple mathematical sentences.

Figure 2. Answer of Problem by Subject

The subject actually understands what is meant of the problem, but the subject of difficulty in conveying what is in his mind or his idea with words. DePorter & Hernacki (1999) say visual people often know what to say, but are not good at picking words.

Wassahua (2016) says that visual people find it difficult to follow verbal instruction. In this study the visual subject solve it more easily by using visible images

rather than using long sentences. Because the visual subject does not have many words to deliver it.
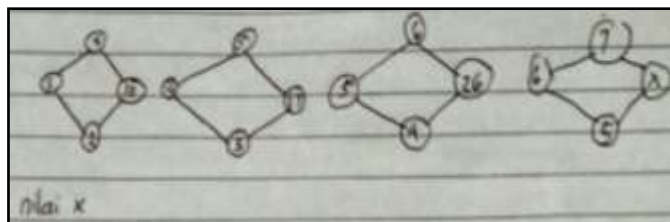

Figure 3. Visualization Image of the Subject

When given verbal instruction they find it difficult to respond, so that the visual subject is more easily responded to in the form of images or in writing. Halim (2012) also said that generally people in the visual style of absorbing information apply a strong visual strategy with images and phrases that are visual. So in solving the problem, visual students will more easily use the image.

Wassahua (2016) says that visual students often misinterpret words or utterances. When doing mathematics problem the subject of difficulty in calculating. Subjects are often wrong in calculating them.

R : "Are you often wrong in calculating in mathematics?"
SV: "yes"
R : "hold on if something goes wrong, you work on it or keep it together?"
SV: "yes do it again".

Although the subject is often wrong in calculation, but able to solve it properly. Subsequently the subject re-examined his work after completing the problem, reinforced the opinion of DePorter & Hernacki (1999) that visual people are meticulous in detail. So when the subject is often wrong in calculation (marks of existing graffiti on students work), the subject is able to solve it correctly. So it can be seen that the three visual subjects in solving the problem in this study is often wrong in calculating the operation of numbers.

Conclusions and Suggestions

From the description above can be seen the characteristics of visual learning styles in solving mathematics problem are as follows: 1) visual students prefer written instructions rather than listening, 2) visual students prefer to imitate something ever seen before, 3) have difficulty in expressing mathematical ideas, 4) prefer to use images in solving problems, 5) often wrong in calculation the number operations.

Based on the conclusions of this study, further suggestions need to be advanced research on the characteristics of visual type learning in solving mathematical problems. For example about the characteristics of mathematically visual learning style

that is in solving mathematical problems. In order to know the characteristics of visual type learning style that is mathematically in solving mathematical problems. So as to contribute to the world of mathematics education.

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