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Problem Solving Skill Sains on Junior High School for Different Academic

Arini Dwi Larasatining Retnowati[1],Suratno[2], Yushardi[2]

[1]Student of Sains Education, University of Jember

[2]Lecture of SainsEducation, University of Jember

Email :arinidwilarasati61@gmail.com

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ABSTRACT

The rapid of education today requires empowerment skills to construct a science, one of the ways is adapting and training in a skill of problem-solving to face more advanced through learning and teaching materials. The purpose of this research is to know the difference skill of problem-solving based on learning science in junior high school in the different academic. Collecting data using rubric problem-solving skill given to students with academic distinction on April. The instrument of this research is a rubric problem-solving skill validated by the experts. The data were analysed with descriptive quantitative using Microsoft Exel. The result of data analysis of this research, there are some differences in problem-solving skills science of a junior high school of difference academic. A student who got the high score in academic tends to have better problem-solving skills.

INTRODUCTION

The rapid development of the world of education requires students to be able to keep up with the times in order to adapt to the environment. The best adjustments can be obtained from the world of good education. Good education is a meaningful Education. Meaningful learning is a long term memory learning. As is meaningful learning then, students can easily associate new information on concepts relevant in their cognitive structure. One of the most important ways to gain learning meaningful is to practice the skills-based problem solving for students, because of this important competency is one that we believe should be fully embraced in our education systems (Shute et al, 2016).

In addition, with the problem solving skills students can be trained to solve all the problems that exist in life. Problem solving is a basic part of living (Philip et al, 2017). Problem solving refers to cognitive processing aimed at figuring out how to achieve a goal. Where students are required to discover for themselves material concepts that are appropriate and appropriate for solve a problem. The process of training problem solving can be done in adolescence. Therefore, researchers choose junior high school students as the object of research. Based on illustration of the description, it is necessary to know already where the mastery of problem skills on Junior high school students.

This study aims to determine the differences in the level of solving skills different academic problems.

A. Problem Solving

Problem solving has been studied by reseachers for many decades and is seen as one of the most important cognitive skill in many profesion, as well as in everyday life (Shute et al, 2016). problem solving is a self- directed cognitive-affective-behavioral process, by which an individual or a group attempts to find effective solutions to resolve problems they encounter in real life (Vahid et al, 2017). So, problem solving can also be interpreted is a mental process and the mind in finding and solving a problem based on accurate information that supports, so that the conclusion of the Decision-making process a problem can be done with appropriately. So, Can be concluded that problem solving is an approach that has quantitative settlement measures dnd specifics derived from investigation as well as inventions. That is, students' thinking ability can be extracted through solving the disclosed problem in order to obtain a meaningful learning. Learning process using problem solving with purpose producing a new knowledge must have a close connection with the students' memories meaningful learning. In problem solving, students are expected to link a material that has been studied in advance with the problems at hand. Thus, meaningful learning orlearning that results in a long-term memory is indispensable and is an important factor in training students' problem solving skills.

B. Factors that affect problem solving

According to (Rahmad, 2001) in (Winarso, 2014) states that There are 4 factors that can affect the learning process with problem solving, namely:

1. Motivation. Motivation to learn is one important factor in the process of problem solving. Motivation which will limit the flexibility of learning, as well as low learning motivation can distract in learning. Thus, it can be said that, the learning motivation is height can run flexibly depending on the desire of the individual regarding the depth of matter which will be discussed in solving the problem. Meanwhile, low learning motivation, will divert students' attention into something else that he finds appealing.
2. Trust and wrong attitude. False assumptions can mislead deep understanding learning.
3. Habit. The tendency to maintain a certain mindset in solving problems into one a very important thing, where a critical or creative mindset should be a habit, in order poblem solving learning process is not hampered and can be efficient.
4. Emotions. In the face of various situations, do not realize emotionally involved. These emotions are coloring way of thinking in the whole human being, we can

notrule out emotions. But when it comes to emotion It has reached such a high intensity that it becomes stressful, then it becomes difficult to think efficiently.

According to (Philips, 2008) in (Hassan et al, 2012) In general, there are three steps associated with engineering problem solving proceses, the problem definition, the problem analysis and synthesis and the solution generation. Figure 1 shows a complete cycle of problem solving cycle.

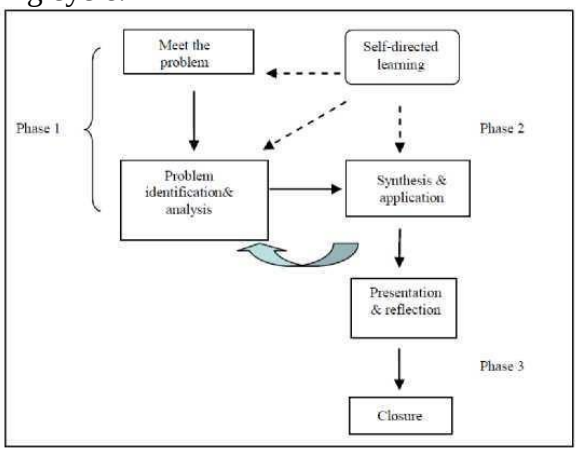

Figure 1.The engineering problem solving cycle (modified from Philips, 2008) in (Hassan et al, 2012)

In this case, the problem solving cycle can be explained starting with the definition of the problem stage, then the identification of the first and the initial analysis, after that stage is the synthesis and application of completion, then the last analysis and data synthesis testing has been done. If it is not suitable then the improvement and if it has been done the presentation and reflection, so obtained the right solution.

According to Maltin (1989) in Patnani (2013) problem solving is required when an individual have a desire to reach a certain goal and that goal has not been achieved. Problem solving skill is a complex cognitive skill related to the ability to remember relation with previous material. In this case, it can be seen that when solving a problem, one the individual not only needs to think, but he needs to think critically to be able to see a problem and think creative to be able to solve the problem. In an effort to solve the problems faced, one individuals will take steps related to cognitive processes (Patnani, 2013). There are some of the cognitive functions involved in problem solving are:

1. Fast think about the characteristics of an object or situation.
2. Classification of objects or ideas
3. Form or establish relationships between objects or ideas
4. Think about the various possible outcomes
5. List the characteristics of the objectives and produce a logical solution (Patnani, 2013).

METHODS

This study is a comparative study. Comparative research is a research done for comparing the value of one variable with another variable; this type of research also uses more than one sample. The research instrument is a questionnaire. The type ofquestion in the questionnaire used is a closed questionnaire that has been validated by

a learning expert. The study was conducted in 2017, with respondents totaling 68 on VIII class from different academic. The collected data were analyzed by using quantitative descriptive analysis in the form on average using Microsoft Excel.

RESULTS AND DISCUSSION

In this section we will discuss the results of research on mathematics problems of junior high schools in different academics who have done research. In the study, the first thing that is done now for classroom teachers will be used for the selection of research subjects. Subsequently, a validated questionnaire was distributed. Then conducted data analysis of research results.

Data obtained from the research results, analyzed using Microsoft Excel (number and average), Then the acquired average is confirmed with predetermined criteria.

Establishment of criteria can be done by using some equations

a. Determines maximum score
   Maximum score =£ indicator X highest ..... score (1)
   = 12 X 4 = 48
b. Determine minimum score
   Maximum score =£ indicator X lowestscore..... (2)
   = 12 X 1 = 12
c. Calculates the range of scores
   Range =Maximum score - minimum score..... (3)
   = 48 - 12 = 36
d. Calculates the score interval
   Interval =Range: many criteria..... (4)
   = 36 : 4 = 9

(Setyowati, 2011).

So obtained, the preparation of problem solving skill parameters, which are divided into 4 criterias that is: very good, good, pretty good and not good, are:

No	Skor	Kriteria
1	39 - 48	Very good
2	30 - 38	Good
3	21 - 29	Pretty good
4	12 - 20	Not Good

Based on frequency and average calculation results using Microsoft Excel about Problem solving skill there is a different academic, can be seen in the table below.

Tabel 1. Shows the frequency difference and the average

CLASS	VIII A	VIII B
FREQUENCY	1091	1002
AVERAGE	32.0S	29.4
CATEGORY	GOOD	PRETTY GOOD

(Source: author)

Based on the interview results with science teachers, class VIII A is a class that has a

higher academic than class VIII B. While based on the results of research, it can be seen that the mastery of students related skills different academic problem solving (Table 1.1) shows the differences. Differences can be seen in the average value of problem solving skills in grade VIII A students (having a higher academic value than in class VIII B) is 32.08 which is included in the "good" category. That is, the students of class VIII A have the skills problem solving categorized in "good". As for the average results of problem-solving skills in grade VIII B students is 29.4 which is included in the category "good enough". From the average calculation results can be it is concluded that the average result of problem solving skills by grade VIII A students is higher than problem solving skills on VIII B. so, it can be concluded that the improvement of ability the students' academic affects the improvement of problem solving skills by students.

Thus, can be seen that students who have high academic value, have tendency has good problem solving skill level. This is due to the value academics are associated with learning outcomes (cognitive) and good student learning motivation. Students who are have a good motivation to learn, generally can spur himself to know or understand a problem, so students with high academic search and link the previous material with a problem encountered, so the level of problem solving by the student can said to be thorough or detailed. Meanwhile, if the student's motivation to learn a less good lesson, then student's attention will be divided. Thus, students do not focus on doing a the given problem. The result of this research supported by the study used, there is a correlation between the level of problem solving skills with motivation, the motivation of each student can be ascertained differ between students on high and low academic value.

According to the field dependent theory (wapner, 1986) in (Philip et al, 2017) people who possess the field independent cognitive style tend to notice detail and have greater analytical and differentiating ability compared to field dependent people - that is, people who appear to view events globally without considering the details. Thus, a field independent person tends to articulate problem as discrete from their backgrounds and easily differentiates objects from embedding. So otherwise people who are less familiar with problem solving, they do not solve the problem with no detail. Students who already have good problem solving skills they already understand there are three steps associated with engineering problem solving proceses, the problem definition, the problem analysis and synthesis and the solution generation (Hassan et al, 2012).

Bransford and Stein (in Eggen&Kauchak, 1997) explain that a common strategy in problem solving consists of 5 steps, namely:

1. Identify the problem. The first step in solving this problem seems to be a thing Simple, but in fact, understanding a problem is quite challenging consider be able to understand the problem required a power of creativity, resilience and willingness to not in a hurry to solve the problem. The many aspects related to that problem sometimes faced complicate an individual in understanding a problem.
2. Representation of problems or description of the problem. With the image representation helps the individual to give meaning to the problem, which will ultimately help the individual to understand the problem correctly.
3. Selection of problem-solving strategies. In this case, the choice of strategy in problem solving becomes very important because it provides guarantees for solving the problems are given.
4. Implementation of solving problems. The key to the success of strategy implementation is that understanding right about the problem. If in this

implementation there are difficulties, then it needs to be seen again whether problems encountered are understood correctly. If there is an error, then the individual is necessary start again from the beginning to identify and understand the problem correctly, then try again the appropriate troubleshooting strategy.

5. Evaluate the results. Evaluation results can describe the reality evaluation, whether problem solving strategy that applied really already overcome the problems encountered.

CONCLUSION

Problem-solving skills are crucial to preparing students for global competition. Based on the result research is students who have a high academic value, have a tendency to have a skill level good troubleshooting.

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