

**AN ANALYSIS OF THE SCIENCE PROBLEM SOLVING CAPABILITY BASED ON  
PERSONALITY TYPES ACCORDING TO THE HIPPOCRATES – GALENUS ON THE  
SEVENTH GRADE ENVIRONMENTAL POLLUTION MATERIAL JUNIOR HIGH SCHOOL  
DHARMA LESTARI SALATIGA**

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**Abstract**

The type of personality possessed by students will affect the problem-solving process. This study aims to describe students' ability to solve problems based on their personality type of students. This type of research is descriptive qualitative research. The research subjects were seventh-grade students of SMP Dharma Lestari Salatiga. The instruments used are personality test sheets, problem-solving test sheets, and unstructured interviews. The data were analyzed using the Miles and Huberman model analysis. The results of this study indicate that the subjects of the melancholic, choleric, and sanguine personality types are still not good at solving Polya problems. However, on the subject of the phlegmatic personality type, the results of trial solving abilities are not good, sufficient, and good in solving Polya problems. It can be concluded that the research subjects solved problems with good, sufficient, and poor categories.

**Keywords:** Problem-solving, personality types, environmental pollution material

**Introduction**

In education, the ability to solve problems is not something foreign to be discussed. The word education will be related to learning. According to (Pane & Darwis Dasopang, 2017), learning is a way for a person to make a change in terms of understanding and changing behavior. Learning is also related to teaching, while teaching is always related to learning. Learning gained from a person will affect the extent to which a person's ability. A good person's ability will be formed when someone wants to hone with existing experiences. In education, there are still many students who are not aware of the extent of their abilities. One of the abilities possessed by students is cognitive ability. One way to hone cognitive abilities is to do problem-solving. Cognitive abilities are very important in the learning process. Because in the learning process, students will have experience, this experience will make learning to develop the quality of each individual.

According to (Fitriani, 2020), problem-solving is an application of concepts and skills. Skills are meant in the form of understanding, memory, analysis, synthesis, and evaluation. According to Polya contained in (Hadi & Radiyatul, 2014), the problem solving used using the solving steps: understanding the problem, determining the problem-solving strategy plan, completing the problem-solving strategy, and re-examining the answers obtained. With the problem-solving steps, it can be seen how far the researchers know the students' abilities. Steps to solve the problem using solving steps according to Polya. Research conducted by (Rahayu et al., 2021) shows that using Polya problem solving can facilitate students' skills in solving

problems. The learning model used is a discovery learning model. Based on (Puspitasari & Nurhayati, 2020) shows the results of their research that with discovery, learning can achieve an education to be achieved. In a study (Kirisci et al., 2020), the Solomon four-group research design can improve students' creative problem-solving abilities through a selective problem-solving model.

Everyone must have a character that can not be separated from him or that has been owned since childhood. A person's character can be seen through the characteristics possessed. As stated in the Qur'an in the letter Al-Baqarah: 273, there is a snippet of the means "you know them by looking at their characteristics." So it is proven in the Qur'an that by knowing a person's characteristics, we see that person's character or personality. (Ar-Razi, 2019)

The abilities possessed may be influenced by the presence of a person's personality. As has been said by (Razak & Sutrisno, 2020) that the differences in behavior that each person has owned will affect in solving problems because when a person receives information, processes information, and how follows up on a problem. A person's personality can be seen based on the behavior that a person has. Based on the theory of an expert, namely the Hippocrates - Galenus character, classifying human personality based on four personality types: the melancholic personality type, the choleric personality type, the sanguine personality type, and the phlegmatic personality type found in (Littauer, 2013). Each personality has its indicators. Like students, students who, when explained, have unique responses, such as chatting with their friends, playing fun on their own, sleeping, and some even paying attention. All of these things will be examples of indicators of each person's personality.

Therefore, research on student abilities based on the personality types possessed by students is expected to find out the abilities possessed by students based on the personality type according to Hippocrates - Galenus.

## **Method**

This qualitative research explains the analysis of science problem-solving abilities based on the personality type according to Hippocrates-Galenus on the material of environmental pollution in class VII. The problem-solving abilities observed included problem-solving abilities based on the melancholic personality type, problem-solving abilities based on the choleric personality type, problem-solving abilities based on the sanguine personality type, and problem-solving abilities based on the phlegmatic personality type. The research subjects on problem-solving abilities were categorized as bad, sufficient, and good problem-solving abilities. Data collection was done by answering questions on test sheets and interviews. This research was taken from the subject of class VII B at SMP Dharma Lestari.

## **Result and Discussion**

This study discusses the ability of a student to solve problems based on the personality type according to Hippocrates-Galenus. According to Abdurrahman (Fitriani, 2021), problem-solving is an application of concepts and skills. Skills are meant in the form of understanding, memory, analysis, synthesis, and evaluation. Personality type is a characteristic possessed by every human being. Environmental pollution is the impact of the lack of maintenance of the

surrounding environment that can harm the activities of living things. Environmental pollution is divided into three types, namely water pollution, soil pollution, and air pollution.

Table 1: Personality type test result

Personality Type	Frequency
Melancholic	8
Choleric	1
Sanguine	3
Phlegmatic	15
Multiple	4

Based on table 1 that the research that has been done, there are data such as in the table that there are eight students with a melancholic personality type, one choleric personality type, three sanguine personality types, and fifteen students with phlegmatic personality types, and four multiple personalities.

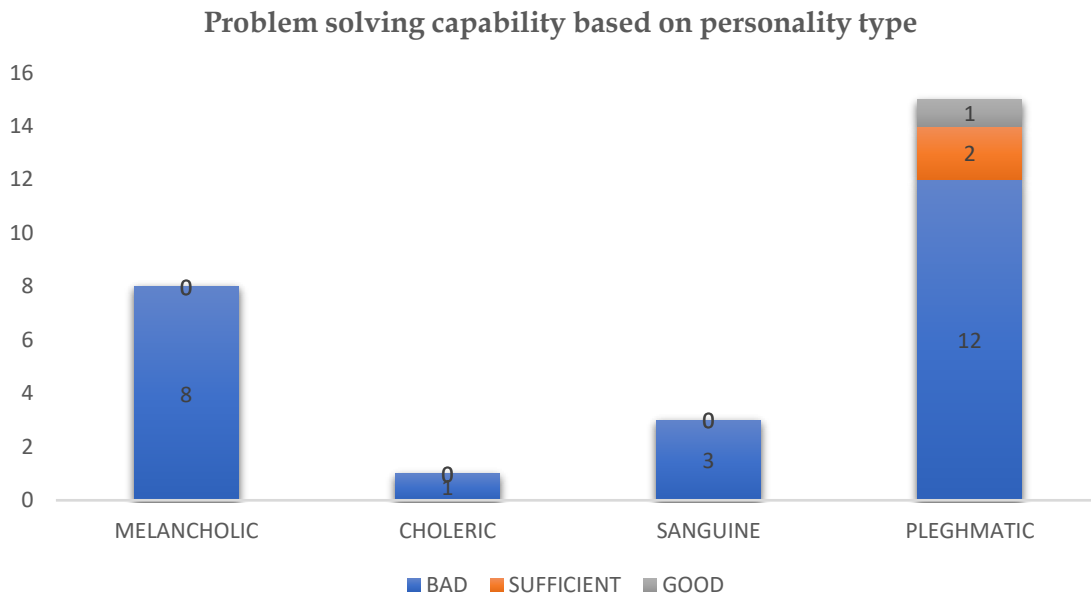


Figure 1: Overall analysis result

Figure 1 that students with problem-solving skills in the poor category are 27 out of 31 students, the sufficient category is three out of 31 students, and the good category is one out of 31 students. However, if analyzed according to each personality type, there is problem-solving based on the melancholic personality type; all students have problem-solving abilities in the poor category. In the choleric personality type, all students have problem-solving abilities in the poor category. In a sanguine personality, all students have poor category problem-solving abilities. In the phlegmatic personality in problem-solving, there are twelve students in the poor category, two in the sufficient category, and one in the good category.

Based on the results of the analysis of science problem-solving abilities based on personality types, some students were further investigated, including:

Table 2: Category problem-solving based on personality types

No	Initial	Personality Types	Problem-solving criteria
1.	MNM	Melancholic	Bad
2.	AAA	Choleric	Bad
3.	HM	Sanguine	Bad
4.	AAA	Phlegmatic	Bad
5.	MARP	Phlegmatic	Sufficient
6.	ZAPJ	Phlegmatic	Good

Table 2 that on the problem-solving ability of melancholic personality. Based on the personality questionnaire results, they tend to have character. If they do something, they must be regular, for the test results have poor problem-solving skills. In this study, students with the initials MNM in understanding the problem are still not good, in making problem-solving plans are also not good, in carrying out problem-solving plans are not good, so in re-examining the answers, they are still not good. While the results of interviews conducted by researchers on subjects with the initials MNM tend to still lack the knowledge they have and the condition of the subjects who feel nervous in interviews makes subjects with melancholic personalities have poor interview results. This is to research conducted by Pamungkas and Siswanto that subjects with melancholic male personalities are better than female melancholics in the aspect of explaining and checking the correctness of the answers obtained, while female melancholics are very good in aspects of making mathematical models. (Pamungkas & Siswanto, 2021)

Choleric personality type problem-solving ability. Based on the results of personality questionnaires, they tend to have characters who never give up and like to manage other people, for the test results have a poor ability. It is proven in this study that subjects with the initials AAA in understanding the problem is still not good, in making problem-solving designs have poor results, in carrying out problem-solving are not good until in re-checking the answers are also still not good. Meanwhile, the results of interviews conducted by researchers on AAA subjects tend to lack knowledge and experience in responding to existing problems. In accordance with the theory put forward by Sutrisno and Razak that the choleric personality type cannot write explicitly what is known and what is asked in the problem, and in solving problems using elimination and substitution methods in solving equations, in re-examining answers based on the steps that have been taken. conducted. (Razak & Sutrisno, 2018)

Sanguine personality type problem-solving ability. Based on the results of personality questionnaires, emotional characters are easily influenced in all situations, for the test results have poor problem-solving skills. It is proven in this study that the subject with the initials HM in understanding the problem is still not good, in making a problem-solving design has poor results, in carrying out problem-solving it is not good, so that is re-examining the answers it is still not good. While the results of interviews conducted by researchers on the subject of HM still need broader knowledge to solve these problems. This is to research conducted by Amalia and Widodo that the sanguine personality type in problem-solving cannot fulfill all stages of problem-solving, namely in understanding problems, planning in problem-solving, implementing the problem-solving plans, and re-examining answers. (Amalia & Widodo, 2019)

The problem-solving ability of the phlegmatic personality type. Based on the results of a personality questionnaire with a character that prefers peace and does not have a specific schedule to carry out its activities. The test results have three categories, namely the bad category, the sufficient category, and the good category. The results showed that the bad category was owned by the subject with the initials AAA having a poor understanding of the problem, making the design of problem-solving not good, the implementation of problem-solving was not good, and in re-checking the answers, it was still not good. The results showed that the subject with the initials MARP had a fairly good understanding of the problem, adequate problem-solving design, implementation of a good problem-solving plan, and good checking of answers. The research results in the good category are owned by the subject with the initials ZAPJ having a good understanding of the problem, having a good problem-solving design, implementing a good problem-solving plan, and re-examining the answers well. At the same time, the results of interviews conducted by researchers on subjects with the AAA category are still lacking in knowledge and experience of the problem. In interviews held by the subject with the sufficient category with the initials MARP, the subject has sufficient knowledge about the problems that occur but still lacks experience. Interviews conducted by researchers with good categories owned by subjects with the initials ZAPJ have good knowledge and experience that supports the problem-solving that the subject does. In accordance with the theory put forward by Razak and friends that the subject is phlegmatic in solving problems following the Polya steps, namely understanding the problem, planning a solution, carrying out a settlement plan, and re-examining. (Razak et al., 2018)

## Conclusion

Based on the data that has been analyzed, it can be concluded that all melancholic personalities have eight students in bad problem-solving categories, all choleric personalities have one student in bad problem-solving categories, all sanguine personalities have three students in bad problem solving, and phlegmatic personality in solving problems there are twelve students in the category of solving problems are not good, two students in the category of problem-solving are sufficient, and one student with problem-solving in the good category.

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