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Students' Creative Thinking Ability in Solving Open-Ended Problems Based on Personality Type

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Abstract

This study aims to determine the creative thinking ability of junior high school students in solving open ended problems in terms of students' different personality types. This type of research is descriptive qualitative with instruments in the form of Hippocrates - Galenus personality type questionnaire and written test of creative thinking ability on pythagorean theorem material. The subjects of this study consisted of 31 students of class VIII A of Walisongo 1 Semarang Junior High School. The results of this study showed that (1) the results of filling out the personality type questionnaire from 31 respondents obtained 29% of students with sanguinis personality type, 19% of students with choleric personality type, 23% of students with melancholic personality type and 29% of students with phlegmatic personality type. (2) subjects with melancholic personality type have high creative thinking ability, subjects with sanguinis and choleric personality type have moderate creative thinking ability, while subjects with phlegmatic personality type have low creative thinking ability. This study also shows that each student with a different personality type can affect the creative thinking ability of each student.

Keywords: *creative thinking ability, personality type, open ended, sanguinis, choleric, melancholic, phlegmatic, hippocrates-galenus*

INTRODUCTION

Mathematics is a science that is taught at every level of education from elementary to tertiary levels. Creative thinking skills are one of the most important objectives of learning mathematics (Lailiyah et al., 2021). It is one of the crucial subjects that students must master. Therefore, from elementary to high school, mathematics is one of the subjects that determine graduation. As stated in the Regulation of the Minister of National

Education Number 58 of 2013 concerning Content Standards states that "mathematics subjects need to be given to students starting from the elementary school level of education to understand the context and concepts to solve problems and have attitudes and behaviours such as the ability to think logically, analytically, systematically, critically, and creatively and work together".

Creative thinking skills are needed to meet the increasing demands, challenges, and global competition as well as the rapid development of science and technology (Hidayat et al., 2020). This understanding is in line with Yuliati et al research (2021) which states that creative thinking skills are needed by students in supporting learning achievement Students must also master the highest competency, namely the ability to think creatively (Siswono, 2018). Creative thinking is defined as a creative ability that can be interpreted as a way of thinking that can change or develop a problem from the other side and is open to ideas, even unique ones (Meika & Sujana, 2017). Creative thinking ability can be known through creative thinking indicators (Silver, 1997) states that to assess the creative thinking ability of children and adults can be done using "The Torrance Test of Creative Thinking (TTCT)". The three components used to assess creative thinking ability through TTCT are fluency, flexibility, and novelty. Meanwhile, Guilford stated that creative thinking skills consist of aspects of fluency, flexibility, originality, and elaboration (Trianggono & Yuanita, 2018). The level of creative thinking ability refers to the three aspects used to assess creative thinking ability, which can also be used as a benchmark for creative thinking ability. The level of creative thinking ability consists of 5 levels, namely level 4 (very creative), level 3 (creative), level 2 (moderately creative), level 1 (less creative), and level 0 (not creative) (Siswono, 2018). Creative thinking skills are needed in solving mathematics problems. One of the mathematics problems that requires creativity in solving is open ended type problems.

Open ended type problems are problems that allow several ways to solve and have a variety of correct answers (Jayanti & Julianingsih, 2021). When trying to answer open ended questions, students can gain new experiences in various ways, some of which have never been tried before (Wijayanti et al., 2019). It can be concluded that open ended questions are questions that can be answered in various ways. Open ended questions can be applied to the pythagorean theorem material because the problems presented are more complex and their applications are often found in everyday life. Pythagorean theorem

material is the material of grade VIII junior high school students. During the learning process, students need to be familiarised with open-ended problems in the hope that they will be able to express ideas more freely and not just stick to one solution method (Ismara, 2017). One of the studies related to creative thinking skills in solving open-ended problems is Salahuddin et al. research (2019) which concluded that as many as 14 students were at a less creative level, as many as 3 students were at a fairly creative level and at a very creative level, as many as 14 students. Each student has different creative thinking abilities because each student has a different personality type in solving problems (Azis, 2018).

According to Dewiyani (2009) in her research, personality type has an impact on the way students think. In addition, research conducted by Agustina et al. (2013) showed that students with sanguinis, choleric, melancholic, and phlegmatic types approach problem solving differently. Thus, it can be concluded that students of different personality types have different ways of thinking. A person's personality is a quality that produces consistency in feelings, ideas, and behaviour (Sujanto et al., 2004). According to Widiantari & Herdiyanto (2013), personality is a characteristic of a person that causes consistency in feelings, thoughts and behaviour. From this description, it can be concluded that personality is a person's characteristics that describe the person's behaviour, thoughts and personality. There are many theories that can be used to better understand students' personality types. One theory that is still widely used and continues to be explored is the Hippocrates-Galenus Typology personality theory. According to the Hippocrates-Galenus Typology, personality is classified into four, namely: choleric, sanguinis, melancholic and phlegmatic (Maftuh, 2015).

Some studies show the results of different levels of creative thinking in each personality type. Among them is research conducted by Lestari (2020) showing that the creative thinking abilities of students with sanguistic, melancholic, choleric, and phlegmatic personality types are in accordance with the aspects of fluency by providing various problems and alternative answers. In the indication of flexibility, any topic can provide more than one technique to complete the task successfully. For each of these themes, the indication of uniqueness can provide solutions to problems with unique, and different approaches. Each topic can find a thorough solution with the right answer in the elaboration indicator when answering a problem. In Azis research (2018) In terms of

problem solving, each personality type has varying creative thinking talents. Phlegmatic personality types are able to demonstrate fluency, adaptability, and originality. While sanguinis and choleric personality types can show components of fluency and flexibility, melancholic personality types can only show components of fluency. According to Hidayati et al. (2020) in their research, melancholic personality types are able to understand contextual difficulties given in mathematics, and students are able to propose a number of diverse answers. Meanwhile, sanguinis and choleric personality types struggled to generate diverse and unique ideas. Phlegmatic personality types are less comprehensive in problem solving and are unable to present various options and suggestions for various solutions. Whereas in Saefudin research (2020), students with sanguinis personality type wrote down fresh ideas and problem solving with cohesive stages, while students with sanguinis personality type were unable to present several alternative answers. Students with choleric and melancholic personalities may produce alternative responses that deviate from their original views. Students with phlegmatic personality make replies using a careful process.

Based on the description above, this study aims to describe the creative thinking ability of junior high school students in solving open-ended problems of Pythagorean Theorem material in terms of personality type. This research is expected to provide an overview of students' creative thinking skills in terms of personality type.

METHODS

This research is a qualitative and descriptive research. The time of this research was held in the even semester of the 2022-2023 school year which was carried out at Walisongo 1 Junior High School in Semarang. The subjects in this study were 31 students of class VIII at SMP Walisongo 1 Semarang. The data collection technique in this study used a student personality type questionnaire instrument, creative thinking ability test and interviews. Subject selection by filling out a questionnaire through google form to students about their personality type, determined 8 research subjects with different personality types.

The main instrument in this study is the researcher where the researcher will go into the field himself, both at the grand tour question, focused and selection stages, conduct data collection, analyse and make conclusions (Sugiyono, 2010). The next instruments are creative thinking ability test questions and interview guidelines as supporting instruments. The test question instrument contains 2 open-ended pythagorean theorem questions that contain 4

indicators of creative thinking. Both questions have one single answer each with various ways of solving. After giving the test, interviews and documentation were conducted to the subject as a data validity test before data analysis. The data obtained was then analysed using non-statistical data, (Sugiyono, 2010) defining qualitative data as a systematic procedure for collecting and synthesising data from interviews, field notes, and documentation. In the research, triangulation techniques were used to test the validity of the data obtained. Triangulation of techniques is done by using various methods, data from the same source (Sugiyono, 2010). After the results of the analysis are known, then drawing conclusions or verification is carried out.

RESULTS AND DISCUSSION

The implementation of this research was carried out by giving a personality type test to class VIII SMP Walisongo 1 Semarang with a total of 31 students. The personality test results obtained 9 students with sanguinis personality type, 6 students with choleric personality type, 7 students with melancholic personality type, and 9 students with phlegmatic personality type. From the results of the personality test, two students from each personality type will be taken as research subjects. The following are the results of observations from eight subjects who have worked on open ended creative thinking test questions and have been interviewed.

Creative Thinking Ability of Sanguinis Personality Type Students

Based on the research results, it can be seen that the sanguinis personality type subject can fulfil the fluency aspect, the subject is able to write and understand the known and questionable information from the problems in the problem correctly, the subject is also able to provide answers correctly and is able to solve the problem smoothly and coherently. Subjects with sanguinis personality type also fulfil the aspect of originality, the subject is able to provide different and unique answers, where the subject is able to apply and combine between formulas to obtain new formulas to make it easier for the subject to solve problems. This is in line with research conducted (Lestari, 2020) which states that students with a sangunis personality type can provide problem solving in a unique, new and different way for each subject. In the aspect of detail (elaboration) the subject with the sanguinis personality type is able to complete the missing information through other information that is already available in the problem and the subject can solve the problem by using the new information obtained by the subject. While in the aspect of flexibility, the subject with sanguinis personality type could not provide

different answers from what the subject did but the subject with sanguinis personality type was able to see the solution from a different point of view.

This study is also in line with research conducted by (Hidayati et al., 2020) and (Saefudin, 2020). In the research (Hidayati et al., 2020) stated that sanguinis subjects have not been able to provide a variety of solutions and a variety of different solution ideas. Whereas in research (Saefudin, 2020) stated that students with sanguinis personality type can write new ideas and write problem solving with steps coherently, but students with sanguinis personality type have not been able to provide different alternative answers. This is consistent in this study where the sanguinis personality type subject fulfils the fluency, originality and elaboration aspects, but because the subject has not been able to provide different and diverse answers, the subject has not fulfilled the flexibility aspect. Because it does not fulfil the creative thinking indicators of the flexibility aspect, the subject with sanguinis personality type is included in the level 3 creativity category (Creative) where the subject can fluently solve a problem and can show new answers in different ways even though they cannot determine alternative solutions.

Creative Thinking Ability of Students with Choleric Personality Type

Based on the results of the study, it can be seen that the choleric personality type subject can fulfil the fluency aspect, the subject is able to easily understand the information known and asked from the problems contained in the problem correctly, the subject is also able to provide answers correctly and is able to solve the problem coherently and accurately. Subjects with the choleric personality type also fulfil the aspect of originality where the subject is able to provide different and unique answers, where the subject is able to apply between two different formulas to obtain a new formula that will be used by the subject to make it easier to solve existing problems. In the aspect of detail (elaboration) the subject with the choleric personality type is able to complete the missing or missing information through other information that is already available in the problem and the subject can easily solve a problem by using the new information he gets. While in the aspect of flexibility, the subject with the choleric personality type has not been able to provide different answers or more than one alternative answer but the subject with the choleric personality type is able to see the solution from a different point of view.

This study is also in line with research conducted by (Azis, 2018) where in his research, choleric personality type students are able to solve mathematical problems

fulfilling all components of creative thinking, except for the flexibility component the subject has not been able to fulfil. This is consistent in this study where the choleric personality type subject fulfils the fluency aspect, originality aspect and elaboration aspect, but the subject with the choleric personality type has not fulfilled the flexibility aspect because he has not been able to provide different and diverse answers. Because it does not fulfil the creative thinking indicators of the flexibility aspect, the subject with the choleric personality type is included in the level 3 creativity category (Creative) where the subject can fluently solve a problem and can show new answers in different ways even though they cannot determine alternative solutions.

Creative Thinking Ability of Melancholic Personality Type Students

Based on the research results, it can be seen that the melancholic personality type subject can fulfil the fluency aspect, the subject is able to easily understand and write down the information that has been stated in the problem contained in the problem correctly, the subject is also able to provide answers correctly and solve the problem coherently and correctly. In the aspect of flexibility, the subject with a melancholic personality type is able to solve the problem coherently and correctly and the subject can provide alternative answers more than one with a different point of view. This is in line with the results of research by Lestari, et al (2020) who said that subjects with melancholic personality type can provide more than one method to solve problems appropriately. Subjects with melancholic personality type also fulfil the aspect of originality where the subject is able to provide different and unique answers, where the subject is able to combine two different formulas to produce a new formula that will be used by the subject to make it easier for the subject to solve existing problems. In the aspect of detail (elaboration), the subject with melancholic personality type is able to complete the missing information through other information that is already available in the problem and the subject can easily solve a problem using the new information obtained by the subject.

In line with the results of Hidayati et al. research (2020) melancholic personality type students are able to understand the mathematical contextual problems presented, students are able to provide diverse solutions and a variety of different solution ideas. Whereas in Saefudin research (2020) melancholic personality type students can write different alternative answers with coherent and detailed steps. This is appropriate in this

study where melancholic personality type subjects are able to fulfil aspects of fluency, flexibility, originality and elaboration. This is because melancholic subjects have high diligence and thoroughness in solving problems. Because the subject fulfils all indicators of creative thinking, the subject with a melancholic personality type is included in the level 4 creativity category (Very Creative) where the subject is able to solve problems with more than one possible solution or solution method or create different problems flexibly and smoothly.

Creative Thinking Ability of Phlegmatic Personality Type Students

Based on the results of the study, it can be seen that the phlegmatic personality type subject can fulfil the fluency aspect, the subject is able to easily understand and write down the information that has been stated in the problem contained in the problem correctly, the subject is also able to provide answers correctly and solve the problem coherently and precisely. In the aspect of detail (elaboration), the subject with phlegmatic personality type is able to complete the missing information through other information that is already available in the problem and the subject can easily solve a problem using the new information obtained by the subject. Whereas in the aspect of flexibility, subjects with phlegmatic personality type have not been able to provide different answers or more than one alternative answer but subjects with phlegmatic personality type are able to see solutions from different perspectives. In the aspect of originality, subjects with phlegmatic personality type are able to provide different and unique answers, where the subject is able to combine two different formulas to produce a new formula but the subject is less careful in solving the problem so that errors occur in the answer results.

This study is also in line with research conducted by Hidayati et al. (2020) which resulted in the conclusion that students with phlegmatic personality type have not been able to provide a variety of solutions and a variety of different solution ideas. Whereas in Azis research (2018) phlegmatic personality type students can show the creative thinking components of fluency, and detail. This is appropriate in this study where phlegmatic personality type subjects are able to fulfil the fluency aspect, and the elaboration aspect. However, the subject has not been able to provide different and diverse answers, in the flexibility aspect and the subject is less careful in solving the problem so that there are errors in the answers to the originality aspect. Because it does not fulfil the indicators of creative thinking in the aspects of flexibility and originality, the subject with the

phlegmatic personality type is included in the level 2 creativity category (Moderately Creative) where the subject is able to produce answers or problems that are different from the general habit but does not do it fluently or smoothly.

CONCLUSIONS

This study tells that melancholic personality type has high creative thinking ability, subjects with sanguinis and choleric personality type have moderate creative thinking ability, while subjects with phlegmatic personality type have low creative thinking ability. This study shows that each student with a different personality type can affect the creative thinking ability of each student.

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