



Analysis of Critical Thinking Capabilities in Solving the Problems of Building Space Based on the Student's Introvert Personality Type

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Abstrak

Penelitian ini bertujuan untuk mendeskripsikan kemampuan berpikir kritis siswa berdasarkan tipe kepribadian introvert dalam menyelesaikan masalah bangun ruang dalam menyelesaikan masalah bangun ruang kelas V di SD Hartoco Indah Makassar. Penelitian ini menggunakan deskriptif kualitatif. Data dikumpul melalui tes, angket, wawancara, observasi, dan dokumentasi. Penelitian ini menggunakan teknik analisis data, yang terdiri dari tahap pengumpulan data, reduksi data, sajian data, dan penarikan kesimpulan. Hasil penelitian Kemampuan berpikir kritis siswa dalam menyelesaikan masalah bangun ruang apabila siswa terdorong dan mengasah pikiran dalam memecahkan masalah dengan melatih pikiran dalam menyelesaikan masalah dan mengaitkan permasalahan pembelajaran matematika dengan kehidupan sehari-hari secara konkret dan kontekstual. Tipe kepribadian siswa introvert merupakan kepribadian lebih senang dengan diri sendiri, pendiam yang disebut pribadi yang tertutup, lebih suka dengan pemikiran, konsep, ide, analisis, lebih suka bekerja sendiri daripada bekerja secara berkelompok, cenderung lebih berhati-hati dalam menyelesaikan soal dan memecahkan masalah matematika secara mandiri. Kesimpulan dari penelitian ini adalah dengan kemampuan berpikir kritis siswa dalam menyelesaikan masalah bangun ruang dapat dilihat dari tipe kepribadian siswa introvert.

Kata Kunci: Berpikir Kritis, Kepribadian Introvert

Abstract

This study aims to describe students' critical thinking skills based on introverted personality types in solving spatial problems in solving fifth grade classroom building problems at SD Hartoco Indah Makassar. This research uses descriptive qualitative. Data were collected through tests, questionnaires, interviews, observations, and documentation. This study uses data analysis techniques, which consist of stages of data collection, data reduction, data presentation, and drawing conclusions. Research results Students' critical thinking skills in solving spatial problems are encouraged and sharpened their minds in solving problems by training their minds in solving problems and linking mathematics learning problems with everyday life in a concrete and contextual way. The personality type of introverted students is a personality that is more comfortable with oneself, quiet who is called a closed person, prefers thoughts, concepts, ideas, analysis, prefers to work alone rather than working in groups, tends to be more careful in solving problems and solving problems. mathematics independently. The conclusion of this study is that the students' critical thinking skills in solving spatial problems can be seen from the introverted students' personality types.

Keywords: Critical Thinking, Introvert Personality

Introduction

The National Education System states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual/religious strength, self-control, personality, intelligence, noble character, and skills possessed by themselves, society, and society. nation, and state (*Undang-Undang Republik Indonesia No. 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*, n.d.) Mathematics lessons are essentially not only the basis for students to continue their education to a higher level, but mathematics will be a life provision for individual students in navigating life, this is because mathematics teaches several thinking skills including the ability to think logically, systematically, analytically, creatively. and critical. Thus, students' thinking skills can develop well (Alimin, 2018). Each student has different abilities in solving math problems. These differences arise because each student has a different thought process (Hasanah, 2018).

The personality type that stands out is the introverted personality type. Students with introverted personalities will tend to be more passive. This personality difference will affect students' critical thinking processes, which will also have an impact on their critical thinking abilities. The problem of the complexity of instilling an understanding of critical thinking in solving mathematical problems in elementary school students is also experienced by several teachers in Tamalate District, Makassar City. They are always looking for alternative solutions so that students can think critically in understanding mathematics learning. Teachers in presenting mathematics material still use conventional learning models and explain abstractly, so students feel that learning mathematics is very complicated and uninteresting and will cause boredom and boredom so that it does not provoke students' critical thinking skills in solving mathematical problems.

The personality types or characteristics of students in schools are generally different, especially in the personality differences of introverted students. This affects the ability of students to receive mathematics subject matter and makes students different in the method of receiving subjects, but teachers in presenting mathematical problems tend to use monotonous learning methods and models that can affect

students' learning motivation as a result, students will find it more difficult to understand mathematical problem solving. Based on the background stated above, the formulation of the problem in this study is how the ability to think critically in solving spatial problems is based on the personality type of introverted class V students at SD Hartaco Indah.

1. Understanding Critical Thinking

Along with the development of learning strategies from teacher-centered to student-centered, a perspective on how students think and acquire knowledge develops. Students are living beings who have the ability to think so of course they can adapt to the learning environment and the living environment, building knowledge from various learning sources around them (Muhsetyo, 2016).

(Irdyanti, 2017), suggests that thinking is a process of generating new mental representations through information transformation that involves complex interactions including reasoning, imagination, and problem solving activities. According to (Najla, 2016). Thinking also includes doubting and ascertaining activities, designing, calculating, measuring, evaluating, comparing, classifying, sorting or differentiating, connecting, interpreting, seeing existing possibilities, making analysis and synthesis of reasoning or drawing conclusions from premises. available, weigh, and decide.

five points of critical thinking steps according to (Ennis, 2011), namely:

- a) Provide a simple explanation, which contains: focusing questions, analyzing questions and asking questions, and answering questions about an explanation or statement.
- b) Build basic skills, which consist of considering whether the source is reliable or not and observing and considering a report on the results of observations.
- c) Summarizing, which consists of deductive activities or considering the results of the deduction, inducing or considering the results of the induction, and making and determining the value of the consideration.
- d) Provide further explanation, which consists of identifying terms and definitions of considerations as well as dimensions, as well as identifying assumptions.
- e) Set strategies and tactics, which consist of determining actions and interacting with other students.

Indicators or systematic behavior in critical thinking, namely as skills to analyze and describe a structure into components in order to know the organization of the structure (Angelo, Thomas A. & Cross, 1995). The goal is to understand a global concept by describing or detailing the globality into smaller and detailed parts.

Analytical questions require that students be able to identify the logical steps used in the thinking process to arrive at a conclusion, then students are skilled at synthesizing, which is the opposite skill with analyzing skills. Synthesizing skills are the skills to combine parts into a new formation or arrangement. Students are also given the skills to recognize and solve problems. This skill is the skill of applying concepts to several new meanings, this skill requires the reader to understand the reading critically so that after the reading activity is complete, students are able to capture some of the main thoughts of the reading, so that they are able to pattern a concept.

Conclusion skills for students are thinking activities based on the understanding or knowledge (truth) they have, can move to reach other new understandings or knowledge (truths). Furthermore, evaluating or assessing these skills requires careful thinking in determining the value of something with various existing criteria. Valuation skills require that they are skilled in providing an assessment of the value measured by using certain standards.

Critical thinking in solving mathematical problems is a cognitive process of students in analyzing systematically and specifically the problems encountered, distinguishing these problems carefully and thoroughly, as well as identifying and reviewing information in order to plan problem solving strategies, students need to be equipped with skills to solve problems because In essence, learning is not just memorizing information but a process in problem solving.

Mathematics will be a meaningless lesson for students if they have not been able to implement mathematical concepts into the context of everyday life, mathematics learning is a learning activity to understand patterns, concepts by emphasizing students' logical ability to seek or explore concepts based on experience. problem solving can be measured based on indicators analyzing mathematical questions focusing questions, identifying assumptions, writing

answers or solutions to problems, drawing conclusions from solutions to problems, finally determining alternative ways of solving problems.

2. The Nature of Learning Mathematics

Learning mathematics is a form of learning using the language of symbols and requires reasoning and logical thinking in proving it. In learning mathematics, past learning experiences play a role in critical thinking-new concepts. Some experts give limitations on learning mathematics, among them (Alimin, 2018), stating that learning mathematics is learning about mathematical concepts and structures contained in the material being studied and looking for relationships between mathematical concepts and structures. Learning mathematics as a process of acquiring knowledge created or carried out by students themselves through the transformation of students' individual experiences (Nurallah, 2018).

Based on the above understanding, it can be concluded that learning mathematics is an individual or group effort for the purpose of studying, recognizing, solving, and developing mathematics. Learning mathematics is more specifically related to understanding, concepts and sets of properties, theorems and principles contained in learning mathematics. Learning mathematics is not limited by age and place because every effort we make, whether consciously or unconsciously, is still related to mathematics. Mathematics learning outcomes are the abilities that students have after students receive their mathematics learning experiences (Burhanuddin, 2018). Based on the understanding of learning, learning outcomes, and mathematics, it can be concluded that mathematics learning outcomes are the level of success or mastery of students in the field of mathematics studies after receiving learning experiences or after taking the teaching and learning process which can be seen in the values obtained (in the form of numbers or letters) from test results.

Indicators of critical thinking skills in mathematics, at least students can include the ability to understand a problem, identify a problem, analyze a problem, identify relevant information, identify the relationship between the problem and the solution, determine the solution, evaluate the solution, make a conclusion to solve the problem and if There is

an alternative solution for a mathematical problem and it is related to the students' daily lives in a concrete way.

3. Definition of Introvert Personality

(Ibrahim, 2018), defines introvert as the attitude of students who collect their energy and strength from within themselves, so they tend to be quiet and less sociable and organized. Students with introverted personalities need more energy to be in a large group of students. In fact, they often run out of energy, so they need to be restored by giving a lot of time to themselves. This is the reason that introverts are personalities who always seek energy from within themselves. Furthermore, (Mulawarman, 2018), provides an overview of the behavior of introverted students as follows:

- a) Introverts are happy to spend time with themselves. In this case, students with introverted personalities usually like to do things or activities they like when they have a lot of free time.
- b) Introverts are those who don't like small talk. This means that students with introverted personalities do not really like shallow and short conversation topics.
- c) Introverts are students who often experience running out of energy when in the midst of many students. This often happens when they have to attend big events. Such as birthday parties, weddings, or other events that involve many students.

Introverts are good listeners. Introverts are known to not like to dominate conversations, they usually tend to choose to be good listeners. An understanding of introverted personality is very important for subject teachers to understand, where by understanding students' personalities, teachers can more easily teach a subject. Regarding the personality characteristics of students at school, Jumirlan (2019) provides an overview of tips that can be used in the teaching and learning process, especially for introverted students, as follows:

- a) The teacher should not interrupt when the students are speaking. Let students tell or talk in discussing something, because it may be possible if a student counselor interrupts his conversation, it will be difficult for him to start talking again.
- b) When starting a conversation, as a student teacher, to find out the problem, you can start a conversation first. An introverted student who is known to be cold, it is

difficult for him to start a conversation with new students.

- c) Try to repeat what he said, it doesn't mean we have to repeat everything. Because it could be that the meaning of introverted students is different from what we mean. So in essence more looking for the same meaning so that the point of view is the same.
- d) Try to always accompany him, because introverted students do not like crowds and prefer silence, so in discussions or in the context of counseling activities, they can find a comfortable place according to their personality.
- e) Try to recognize it more deeply, where a teacher student can be a new student for introverted students. Recognizing an introverted student is not easy, because he has an unpredictable nature. So recognize him slowly and not offend him too much, so that he still feels comfortable.

Introverted students do not mean they can't interact well with others. But introverted students have their own uniqueness, that doesn't mean they're weird. Teacher students do not need to force to solve the problems of introverted students to become extroverted students. Because many artists, poets, research experts, scientists, who have an introverted nature

Method

The type of research used in this study is a phenomenological research type with a descriptive approach, which describes the phenomena that occur in the field according to the actual situation, with problem solving procedures based on what they are. Phenomenological research is to explain what experiences students experience in this life, including their interactions with other students (Sugiono, 2013). This research took place at the Tamalate Public Elementary School Makassar, where at this location this research was carried out at the time the permit was issued. The reason for choosing the location is seen from the background of the material geometric space is one of the materials that is quite difficult to instill in students, especially in the Introvert Personality Type Class V at SD Hartaco Indah.

The focus of the research was carried out with the intention of limiting the activities of the researcher's qualitative study, as well as limiting

research in order to choose which data is relevant and which is irrelevant (Sudarmaji, 2016). The limitation in this qualitative research is based on the level of importance/urgency of the problems encountered in this research. This study will focus on analyzing the critical abilities of fifth grade elementary school students in Tamalate District, Makassar City in terms of the personality types of introverted students.

Research subjects are students or resource persons who are also referred to as informants who have understanding knowledge related to the object of research and can provide information related to research that is currently being carried out. In this regard, the subjects and sources of information for this research are:

- 1) The main subjects of this study were the fifth grade elementary school students who were selected as research subjects.
- 2) Events or activities, namely by making direct observations, researchers can see how the state of the school, and the state of teachers and students.
- 3) Documents or archives, namely various documents as research evidence such as photos of question instruments that can be used as data and direct answers given from students, teachers and school principals (Sudarmaji, 2016).

The main instrument in the research is the researcher himself with various media that can be used as a tool in collecting information and all the data needed (Sugiyono, 2015). This social situation around the school is principals, teachers, students, and teaching and learning activities. Research instruments are tools or facilities made to accommodate and process various data that will be collected in research.

The correct data collection technique is carried out properly so that the data can be justified. In connection with that, to obtain accurate and valid data and information, researchers used several techniques in data collection. Data collection techniques used are tests, questionnaires, documentation, observation and interviews. To collect data in research activities, certain methods or data collection techniques are needed, so that the research process can run smoothly.

Research data is the main source in concluding a research result. Data were collected

with reference to the research objectives that have been formulated previously. In this study, processed using data reduction steps, data presentation, data verification.

The technique of checking the validity of the data is to use something other than outside the data as a comparison against the data. This will be achieved by comparing data from interviews or what is said in public with what is said in private, in addition to comparing the results of interviews with related documents.

Result and Discussion

The focus of this research is to think critically in solving spatial problems on the personality of introverted and extroverted students of class V at SD Hartaco Indah on the material of building space. to know and measure introverted critical thinking focused on critical thinking indicators in solving problems seen from the results of the final test and observation of student activities in learning activities.

The first indicator of critical thinking in solving problems of introverted students is solving problems related to cubes, on the material that has been previously given by the researcher, then continued by giving questions related to the material. Judging from the work of introverted students that they have been able to answer well and also provide the right explanation. Apart from the results of interviews conducted by researchers on introverted students who explained that they understood enough even though the material had to be repeated several times to better understand it, the results of this study were reinforced by the results of previous studies. Rindu Rudianti, (Rindu Rudianti, Aripin Aripin, 2021), introverted subjects, tend to be calm. , research, carefully, and rethink solutions before drawing conclusions. Introverted students are able to develop arguments by developing existing information and providing statements that lead to the steps taken in solving problems, even though they cannot write them down correctly.

The second indicator is solving the problem of building a space by comparing the volume of the block and the volume of the cube. On the material that has been given at the next meeting. Researchers provide material repeatedly to further strengthen students' critical thinking on the material. After that the teacher

gives some questions and students are given the opportunity to answer them. From the results of student work, it has been shown that introverted students understand the material as evidenced by the right answers and explanations for each answer. Furthermore, with the results of interviews which provide a statement that their level of understanding in solving spatial problems is sufficient.

The indicator of solving the problem of ordinary space building into spatial form, the researcher gives the concept repeatedly to provide understanding to students, especially introverts. After being given the material, the researcher gave questions to measure the students' critical thinking level. The results of student work on these questions have given success, namely introverted students are able to answer properly and accurately and are able to provide explanations for each question. Apart from that, the researcher also conducted interviews with introverted students, and they were able to provide answers in their own language, but from the answers, it was already illustrated that introverted students had enough critical thinking to solve the problem of constructing space. what researchers have done. Problem solving critically thinking by introverted students according to (Sri Wijilestari, 2016). The critical thinking process of introverted students from the upper group in solving mathematical problems on the set of four questions given shows that the subject goes through the stages of clarification, assessment, inference as well as strategies and tactics .

This section presents the research results. Research results can be supplemented with tables, graphs (pictures), and/or charts. The discussion section describes the results of data processing, interprets findings logically, relates to relevant reference sources.

The student's personality type has the meaning of a cultural concept that distinguishes introverted and extroverted students based on their eligibility and the existence of rules that regulate the relationship between the two. Introverted students are considered strong, rational, thinkers and closed and quiet individuals who are careful in doing assignments, while extroverted students are known to be sociable, cheerful, like group work and get bored easily, in doing assignments they tend to be in a hurry so that the results of their work are less precise. Therefore, the personality types of students are not the same in competence.

Introverted and extroverted students have their respective advantages in their mathematical abilities, specifically showing that introverted students' mathematical communication skills are higher than extroverted students. In the classroom, introverted children are usually more obedient, more silent, and patient in waiting their turn (Muhaimin, 2018). On the other hand, extroverts are louder and require more attention.

Teachers are more likely to reprimand and scold extroverted children, or punish them. In the classroom, teachers spend more time paying attention and interacting with extroverted children, while introverted children are left to work alone. Most teachers subconsciously and unintentionally benefit extroverted students more by spending more time with them. Compared to introverts, extroverts receive more instruction and receive more help when they have difficulty answering questions. Often teachers give introverts longer time to answer questions, give more clues to get the answer right, and give the opportunity to answer again until the answer is correct.

The focus of this research is to think critically in solving spatial problems on the personality of introverted and extroverted students of class V SD Hartaco Indah on the material of spatial structure. to know and measure introverted critical thinking focused on critical thinking indicators in solving problems seen from the results of the final test and observation of student activities in learning activities. students with introverted personalities in working on problems solving problems related to building space can meet indicators, are able to understand a problem by writing down information contained in a problem, identify the connection of a statement, question, and concept of a problem, able to solve a problem with appropriate, able to make a conclusion from a problem, this is evidenced by introverted students in solving spatial problems that can understand and work critically and are able to answer correctly according to the indicators to be achieved.

Based on the results of the work of extroverted students, namely solving the problem of building space, students gave answers that were not correct, along with explanations for each question. Extroverted students can answer well, all because extroverted students get bored easily and tend not to like learning to build spaces (Suhendra, 2017). students with extroverted personality types in

working on mathematical problem solving problems have not fully met the indicators, are able to understand a problem by writing down the information contained in a problem, identify the link between a statement, a question, and the concept of a problem, able to solve a problem incorrectly, the ability to make a conclusion from a problem is not right, so that in problem solving less able to think critically in solving problems because it has not met the indicators to be achieved.

Differences in critical thinking in solving spatial problems for introverted and extroverted students. Based on the results of observations and interviews conducted, the researcher was able to explain that the enthusiasm for learning between introverted and extroverted students was to have a very high curiosity. It is proven by answering every question given at the time of the interview, even though introverted or extroverted students look very nervous when asked questions, but they are able to answer well.

The results of the interview showed that both introverted and extroverted students had high ability to think critically in solving spatial problems. By giving answers that are a little slow, but for class V students, in providing answers or responses it is very good to be used as research material.

Apart from the results of interviews that have provided answers, student learning outcomes have also provided explanations for their level of understanding. The work of introverted students is very good who have given the right answers and brief explanations of the answers. The results of the work have become evidence of a high level of understanding with the material or concept that has been given.

Likewise with extroverted students who also provide good and appropriate work results. From the results of this work, it has been explained that extroverted students also have a high level of understanding of the concept of building space. From each indicator that has been given, none of them gave a wrong answer, it indicates that extroverted students also have a high ability.

Apart from the work of extroverted students, the results of interviews conducted by researchers on extroverted students can also be used as benchmarks to measure the level of student success. From the results of interviews where students are able to answer well even in everyday language, or students look very

nervous or just confused for a moment to find ways to express what they know. As a researcher, I am quite happy with the students' work which is quite good. This means that the material that has been given is quite well received by students, both introverts and extroverts.

Conclusion

Critical thinking for students with introverted personalities in the fifth grade of SD Tamalate Makassar is to use indicators related to solving spatial problems and comparing spatial shapes. Introverted students are able to answer questions properly and accurately and are also able to provide explanations related to the question. So introverted students are already thinking critically. Introverted students are able to give good answers even with slightly different explanations but have the same meaning. Judging from the work on good introverted students. And also an explanation of each question given. And the results of interviews are in line with the results of answers to questions that have been done by students.

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