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Thinking Profile Of Junior High School Students In Understanding The Concept Of Quadrangles With Linguistic Intelligence, Logical-Mathematical Intelligence, And Visual-Spatial Intelligence

Abstract

This study aims to describe the thinking profile of junior high school students who understand the concept of quadrilaterals with linguistic, logical, mathematical, and visual-spatial intelligence. This research is a descriptive study with a qualitative approach. The research subjects are three seventh-grade students of MTs Misykat Al-Anwar Kwaron, Diwek, Jombang, East Java. The research began by determining the research subjects using the MIR (Multiple et al.) instrument. Relatively similar mathematical abilities and the same gender were also considerations for researchers when choosing subjects. Based on the interview guidelines, the researcher interviewed each subject. Data validity checking used time triangulation. Based on the results of the research that has been conducted, it was found that, (i) students with linguistic intelligence when associating information in grouping quadrilaterals based on alphabetical order, and when associating or connecting information in mentioning the properties of the flat shapes, the students pay attention to the sides first even though what is mentioned is different, such as having four sides, opposite sides are the same length, opposite sides are parallel, and when mentioning the definition of the flat shapes, the students use the genetic definition, (ii) students with logical-mathematical intelligence when associating information in grouping quadrilaterals based on simple images according to them, namely starting from rectangles, squares, then the next one is random, and when associating information in mentioning the properties of quadrilaterals, the students consistently start by paying attention to the number of sides, and continue with the following property, when associating information in mentioning the definition, the students mention the properties mentioned before by starting with the word "quadrangle", (iii) students with visual-spatial intelligence when associating information in grouping quadrilaterals based on their sense of sight are focused on shapes that are easy according to them, namely starting with rectangles, squares and so on, when associating information in mentioning the properties of quadrilaterals, the students use teaching aids and mentioning the number of symmetries of the

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quadrilateral, then randomly mentioning its properties, when relating information in mentioning the definition of the quadrilateral, the student uses the properties that have been mentioned previously, but the subject has difficulty in choosing which property is suitable to represent the definition of the quadrilateral.

Keywords: Thinking profile analysis, Understanding quadrilateral concepts, Multiple intelligence types (linguistic, logical-mathematical, visual-spatial), Junior high school students.

Introduction

Education contributes significantly to the nation's progress because an intelligent nation will provide a thoughtful and characterful life in developing its potential. Law of the Republic of Indonesia No. 20 of 2003 concerning the National Education System Chapter I Article 1 states, "Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential".

Education is not static but dynamic, so it always demands continuous improvement. Its role is significant in creating an intelligent, peaceful, open, democratic life and forming superior human beings. One of them is mathematics education in schools. Mathematics is a universal science that underlies the development of modern technology, has a role in various disciplines, and advances human thinking.

One of the essential potentials possessed by students is thinking. This potential must be developed appropriately and gradually, increasing its benefits to face their future (Soedjadi, 2007). As a tool, mathematics has a role in developing and training students' thinking skills in solving problems, especially problems in everyday life. This is explicitly stated in the Competency-Based Curriculum (2006) regarding mathematics learning objectives.

Soedjadi (2000:45) states that the goals of mathematics education for the future must pay attention to (1) Formal goals, namely the goals of mathematics education that focus more on organizing reason and forming the child's personality and (2) Material goals, namely educational goals that focus on the application and skills of mathematics. To achieve these goals, seriousness is needed from education practitioners, especially teachers and students themselves, so that mathematics can be understood well and can be applied in everyday life.

According to Nickerson (in Mtwakapenda, 2004), in teaching and learning mathematics, understanding concepts is a fundamental aspect that is the main focus and becomes one of the goals of the process. According to Sutawidjaja (2013), understanding concepts is very important to see why some students succeed while others fail in mathematics. Many students need help digesting information from teachers due to the incompatibility of the teacher's teaching style with the student's learning style. On the other hand, if the teacher's teaching and learning style is to the student's learning style, all lessons will feel very easy and enjoyable. If the teacher succeeds in entering the student's world by adjusting the student's learning style, then the student will be willing to give his teaching rights to the teacher.

Teachers often need to remember that even though students are in the same place (in one class), studying the same learning material to achieve the same goals, there are differences in students' learning abilities. Each individual has different potential abilities (such as talent and intelligence). Therefore, Teachers must pay attention to the differences in each student's ability and intelligence level.

According to Ruseffendi (1991), in the mathematics learning process, ten factors influence the

success of children in learning, namely children's intelligence, children's talent, willingness to learn, children's interests, material presentation models, teacher personality and attitude, learning atmosphere, teacher competence, and external conditions, namely society. Teachers in the learning process should consider these ten factors. One of the main factors in achieving children's success in learning is children's intelligence. This is the basis for teachers to pay attention to students' intelligence.

According to Freits (in Yaumi, 2012), intelligence includes the ability to adapt to new environments or changes in the current environment, the ability to evaluate and assess, the ability to understand complex ideas, the ability to think productively, the ability to learn quickly, learn from experience and even the ability to understand relationships.

Each student has many types of intelligence. According to Gardner (2011), humans have multiple intelligences: 1. Verbal-linguistic intelligence, 2. Logical-mathematical intelligence, 3. Spatial-visual intelligence, 4. Bodily-kinesthetic intelligence, 5. Musical intelligence, 6. Interpersonal intelligence, 7. Intrapersonal, 8. Naturalist intelligence.

According to Barrington (2004): "Teaching and learning that is informed by MI is an inclusive pedagogy because it takes a very wide view of intelligence and works towards Teaching and students assessing using more than just two of the intelligences. This allows students to use their own strengths and not be marginalized by having to focus on traditional ways of learning ".

According to Xie (2009): " Teachers involved in multiple intelligences teaching should pay equal attention to students displaying gifts in different intelligences and allow them a variety of ways to express themselves." Teachers involved in teaching students with multiple intelligences should pay equal attention to all students with different intelligences and allow students to express themselves in various ways.

From the description above, by understanding students with multiple intelligences, teachers can recognize the characteristics of these students so that a strategy can be designed for effective classroom teaching according to the material to be delivered. This statement is supported by the opinion of Garagae (2012), stating that: " To the teacher, students' understanding of mathematics is a sign of achievement-having met the goal of teaching". This means that teachers need to assess the understanding of the material studied to determine the achievement of learning objectives. The achievement of this goal will determine the success of students in learning.

Geometry is the material used for research because, according to Walle (2006), 1) geometry helps humans have complete aspirations about their world, 2) exploration of geometry can help develop problem-solving skills, 3) geometry plays a significant role in the field of mathematics, 4) people in everyday life widely use geometry, 5) geometry is full of puzzles and fun.

The reality in the field and the study results show that geometry is one of the areas of mathematics that students consider difficult. According to Yeni (2011), geometry is not easy, and many students need help understanding geometric concepts, reasoning, and problem-solving skills. This is supported by Soedjadi (2000:93), who reported a misconception of the definition of angles by students in his research findings. Students argue that angles must have horizontal legs, and misconceptions also occur regarding parallel lines. Students argue that there are no parallel lines or sides in a trapezoid. The reason is that two parallel lines must be the same length. This condition shows that some students still need to be corrected in providing a definition or understanding of a quadrilateral plane figure. A quadrilateral plane figure is one of the prerequisite materials in studying the material of spatial figures in higher classes. By mastering and understanding quadrilateral plane figures, students will find it easier to master and understand spatial figures.

Walle (2006) said, "Not all students think about geometric ideas in the same way, but students can grow and develop their ability to think and consider in the context of geometry." The number of connections between new and existing ideas will vary for each student. Students will use different ideas to give meaning to the same new idea. Thus, each individual's ability to receive and manage information must be different. This is influenced by various things, one of which is intelligence.

The intelligence studied here only focuses on 1. Verbal-linguistic, linguistic intelligence, is

skilled in communicating and expressing one's thoughts, desires, and opinions. A student is said to have yet to succeed in learning geometry before he can communicate geometric ideas, both in writing and orally and his opinions coherently and systematically; 2. Logical-mathematical intelligence: This intelligence can think abstractly and can connect between geometric concepts; 3. Spatial-visual intelligence, intelligence can understand more deeply the relationship between objects and space, so students who have these three intelligences have the potential to be successful in learning geometry.

Looking at the background above, the researcher is interested in researching the Thinking Profile of Junior High School Students in Understanding the Concept of Quadrilaterals with Linguistic Intelligence, Logical-Mathematical Intelligence, and Visual-Spatial Intelligence.

B.Formulation of the problem

Based on the background, the formulation of the problem in this study is:

1.What is the thinking profile of junior high school students with linguistic/verbal intelligence in understanding the concept of quadrilaterals?

2.What is the thinking profile of junior high school students with logical-mathematical intelligence in understanding the concept of quadrilaterals?

3.What is the thinking profile of junior high school students with visual-spatial intelligence in understanding the concept of quadrilaterals?

C.Term Limitation

To avoid different interpretations, the researcher provides the following terminology definitions:

1.A profile is a view or description of something expressed through a picture or a word description.

2.Thinking is a mental activity involving the work of the brain, feelings, and human will, as well as struggling mentally to understand something experienced or find a way out of the problem.

3.The process of understanding can be linked to the act of understanding accompanied by reasoning.

4.A concept is an abstract idea/concept that is used to classify whether an object is an exmple or not an example.

5.A quadrilateral is a flat shape that is bounded by four line segments. The quadrilaterals discussed are parallelograms, rectangles, squares, kites, rhombuses, and trapezoids.

6.The thinking profile of students in understanding the concept of quadrilaterals is a natural description (facts that are done) of students' mental activities in classifying whether a quadrilateral object is an example. Mental activities include a) grouping quadrilaterals, b) mentioning the properties of quadrilaterals, and c) making definitions of quadrilaterals.

7.Linguistic/verbal intelligence is the ability to express what is in the mind and understand others orally and in writing. People learn by listening, reading, writing, discussing, understanding, summarizing, interpreting, explaining, and remembering what has been read.

8.Logical-mathematical intelligence is using numbers, thinking logically to analyse cases or problems and perform systematic calculations. Children who have logical-mathematical intelligence like playing with numbers and counting, are very orderly in handwriting, have the ability to think abstractly, are directed in carrying out activities based on rules, like to collect and classify things, think with clear, abstract concepts, without words, and images.

9.Visual-spatial intelligence is the intelligence to think about shapes and images and accurately understand the world of images and space. Children with visual-spatial intelligence can capture and understand something with the five senses; visual spatial is related to the ability of the eye, especially colour and space, transforming, namely changing the shape of what is captured by the eye into another form, for example seeing, observing, recording, interpreting in the mind and then pouring the recording and interpretation into the form of a painting, sketch.

Literature Review

Thinking includes many mental activities. Some think while daydreaming while waiting for a lecture, writing an article, reading a book, worrying about their child at home, and many other activities. The work of the brain influences all of these activities. However, as a human being, a person's activities do not only involve the body organ called the brain; thinking also involves the entire human person and also involves feelings and will. Thinking about something also means directing someone to a particular object, presenting it in the mind, and having an idea or insight about a particular object. Sobur (2011) explains that thinking is a mental activity that involves the work of the brain, feelings, and will of humans, as well as struggling mentally to understand something that is experienced or find a way out of the problems faced.

According to Sierpinska (1994), "The process of understanding can be regarded as lattices of acts of understanding linked by reasoning. If A and B are acts of understanding, we may admit that A≤B (A precedes B) if there has been a reasoning R". The point is that the process of understanding can be linked to the act of understanding accompanied by reasoning. If A and B are acts of understanding, then we may be able to state that A occurs before B if there is a reasoning R.

Suppose A and B are activities of understanding. X and Z are objects to be studied, while R is reasoning. The process of understanding begins by identifying object X as the object to be studied. Several questions may arise, such as: what is X? Or what is the use of X? and many others. Suppose A is an act of understanding based on some answers or guesses for a question. Then, find out if the guess is valid. Validation is based on reasoning R. For example, if the question is: what is X? And guessing X is Z, then R is reasoning that proves X is Z or verifies whether X is Z. In this case, the result of reasoning R is the act of understanding B based on the thought X is Z, or X is not Z or other thoughts. They were so, guessing A leads to understanding B, which first existed based on some R.

Quadrilaterals are geometric plane shapes taught in junior high school grade VII and will be a prerequisite for studying spatial shapes in higher classes. The quadrilaterals that researchers will discuss include parallelograms, rectangles, squares, kites, rhombuses, and trapezoids.

Siswono and Lastiningsih (2007) defined a quadrilateral as a flat shape with four sides. Jacobs (1974) stated that a quadrilateral is the union of four line segments that join four coplanar nodes, none of which are collinear; each segment intersects exactly two others, one at the endpoint. "Based on the opinions of experts, this study defines a quadrilateral as a flat shape limited by four line segments.

Intelligence is a term that is difficult to define, causing different understandings among scientists. According to Bainbridge (in Yaumi, 2012), intelligence is the general mental ability to learn and apply knowledge in environmental manipulation and the ability to think abstractly. According to Yaumi (2012), intelligence is the ability to adapt to new environments or changes in the environment, the capacity for knowledge and the ability to acquire it, the capacity to reason and think abstractly, the ability to understand relationships, evaluate and assess, and the capacity to produce productive and original thoughts.

The thinking profile of students in understanding the concept of quadrilaterals with linguistic/verbal intelligence, logical-mathematical intelligence, visual-spatial intelligence is a natural description (facts that are done) of students' mental activities in classifying whether a quadrilateral object is an example or not an example with different student characteristics, including linguistic intelligence, namely being able to express thoughts both in writing and orally coherently and systematically, logical-mathematical intelligence can analyze problems logically, understand and analyze number patterns. In contrast, visual-spatial intelligence can understand more deeply the relationship between objects and space in linking or connecting information about quadrilaterals with existing schemes. Mental activities include a) grouping quadrilaterals, b) mentioning the properties of quadrilaterals, and c) making definitions of quadrilaterals.

2. Materials and Methods

A.Types of research

This study aims to describe the thinking profile of junior high school students who understand the concept of quadrilaterals with linguistic/verbal intelligence, logical-mathematical intelligence, and visual-spatial intelligence. It is a descriptive study using a qualitative approach because the research setting is natural, and the main instrument is the researcher himself.

To obtain the data needed in this study, data collection was carried out in the form of interviews by filling out the MIR test to find out what intelligence the students have and providing an understanding test related to the concept of quadrilaterals. The data obtained from the test results and interview data were then analyzed and concluded. From these conclusions, a descriptive will be obtained about how the thinking profile of junior high school students is in understanding the concept of quadrilaterals with linguistic/verbal intelligence, logical-mathematical intelligence, and visual-spatial intelligence.

B. Subject Study

The prospective subjects of this research are grade VII students because, in addition to the flat geometry material taught in that class, these students already have good mental readiness, can think logically, and their logic is starting to develop compared to grades 4, 5, and 6 of elementary school, while grade IX is approaching the exam.

Along with the topic of this research, the process of understanding the concept of quadrilaterals in students with linguistic/verbal intelligence, logical-mathematical intelligence, and visual-spatial intelligence will be studied, so the subjects studied are students with linguistic/verbal intelligence, logical-mathematical intelligence, visual-spatial intelligence.

The instrument used in grouping research subjects is based on the Multiple Intelligences Research (MIR) test results. The test was given to students in one room, and the results were analyzed by researchers to obtain the intended research subjects.

The criteria for selecting subjects are based on (1) students who have relatively the same or equivalent mathematical abilities, and researchers pay attention to the results of the mathematics subject exam in the previous semester with the criteria of differences in scores between students being in the range of 0-5 on a scale of 0 to 100. (2) students of the same gender as a control variable.

After obtaining the research subjects, the researcher will code the subjects into Table 3.1.

Table 3.1 Research subject code

No Subject	Subject Code	Information
S-1	LI	Linguistic Intelligence
S-2	LM	Logical-mathematical intelligence
S-3	VS	Visual-spatial intelligence

C.Research Instruments

a. Main Instruments

The researcher becomes the main instrument because he is the primary data collector. This means that the researcher, in addition to acting as a research manager, is the only instrument in collecting data through in-depth interviews that anyone else cannot replace. So, the researcher plays the planner, collector, analyzer, and interpreter and finally becomes a reporter for the results study.

b. Supporting Instruments

1. Research Multiple Intelligences Test

This MIR test was conducted to determine the research subjects. The TMIR sheet used in this study has been used by several schools in Indonesia, one of which is in MT schools. Misykat Al-Anwar, compiled by an educational consulting and research institute, is an expert in multiple intelligences.

2. Quadrilateral Concept Understanding Test Questions (TMKS)

This question consists of questions in the form of pictures and questions conducted through interviews consisting of 3 core questions. The core questions include indicators of understanding the concept of a quadrilateral. Questions made in pictures and oral questions (interviews) have goals and predictions of answers seen from intelligence and material. There are two test questions for understanding the concept of a quadrilateral given to research subjects, namely TMKS-1 and TMKS-2 with quadrilateral material. TMKS-1 is intended to reveal the process of understanding the concept of a quadrilateral of the three research subjects, and TMKS-2 is intended to validate or convince researchers of the process of understanding the concept of a quadrilateral of the three subjects. Before the questions are given to the subjects, they will be validated by validators (competent experts or practitioners), who will conduct a readability test on students who are not research subjects. The purpose of validation and readability testing is to assess whether the material, construction, and language used in the instrument are suitable for use in research.

D. Data Collection Procedure

Data collection begins with selecting research subjects by administering an MIR test. This is followed by a comprehension test consisting of picture questions and descriptive questions about the concept of quadrilaterals, and then an interview.

1. Giving a Test to Understand the Concept of Quadrilaterals (TMKS)

After the research subject is selected, students work on a test using descriptive and picture questions to determine the process of understanding the concept of quadrilaterals.

2. Interview

Subjects were interviewed individually so that researchers could explore students' thinking profiles in understanding the concept of quadrilaterals of students with linguistic/verbal intelligence, logical-mathematical intelligence, and visual-spatial intelligence.

To be well documented, the data collection was recorded audio to be played back to avoid the author's forgetfulness. The way they solve the problem is explored based on the process indicators of understanding the concept of a quadrilateral.

Researchers, as the main instrument, conduct interviews to obtain the information needed in data collection to obtain valid data. Triangulation techniques are used to check the validity of qualitative data.

There are several types of triangulation, including source triangulation, data collection technique triangulation, and time triangulation. The triangulation used in this study is time triangulation. Time triangulation is checking the consistency or credibility of research data based on different times. Time triangulation is done by comparing interview data based on TMKS 1 with data based on TMKS 2. The data is ready to be analyzed if it shows the same tendency. However, if it is different or the data tendency is inconsistent, it is necessary to conduct interviews based on TMKS I, I≥ 3 until the researcher obtains consistent data.

e. Research Procedures

The research procedure is to obtain an overview of the thinking profile of junior high school students in understanding the concept of quadrilaterals with different multiplicities.

1. Making proposals and drafting instruments
2. I am preparing the MIR test and designing the instruments used in this study, namely, a test to understand the concept of quadrilaterals and interview guidelines.
3. Instrument validation will be conducted by several validators who are experts in instruments in mathematics education.
4. Conducting MIR tests on several students who are research samples

5. Determining research subjects based on MIR test results and meeting the previously mentioned criteria.
6. Conducting data collection activities namely tests on understanding the concept of quadrilaterals and interviews.
7. Analyzing interview results
8. To compile a description of junior high school students' thinking profiles in understanding the concept of quadrilaterals with linguistic intelligence, mathematical-logical intelligence, and visual-spatial intelligence.

3. Results

Logical-Mathematical Thinking Profile of Students in Understanding the Concept of Quadrilaterals

This study aims to describe the process of understanding the concept of a quadrilateral in logical-mathematical subjects. To obtain the data, the researcher conducted data collection, namely the provision of TMKS I-based interview questions on Saturday, June 13, 2015, from 09.20 to 10.20, and TMKS II-based interview questions on Saturday, June 20, 2015, from 09.00 to 09.50 WIB. The following presents the research data on logical-mathematical subjects.

Exposure, Validation, and Data Analysis of Subjects with Logical-Mathematical Intelligence in Grouping Quadrilateral Plane Shapes.

Interview Data Presentation Based on TMKS I Grouping Quadrilateral Plane Activity

The following is an excerpt from an interview based on TMKS I, logical-mathematical subject:

P: Ow, that means some descendants are good at counting. He. OK, sir, let us get straight to it. There are lots of pictures in the box. Try to group the pictures according to their shape. How many shapes are there?

LM106: There are 6: rectangle, square, trapezoid, parallelogram, rhombus, and kite.

Q: Why did you group the first one as a rectangle?

LM107: what... um... easy to learn.

Subjects with logical-mathematical intelligence group flat shapes based on images that are easy to understand or simple, moving up to images with more complex shapes (LM107), namely starting from rectangles, squares, trapezoids, parallelograms, rhombuses, and kites (LM106).

Interview Data Presentation Based on TMKS II Grouping Activities for Quadrilateral Flat Shapes

The following is an excerpt from an interview based on TMKS II logical-mathematical subjects:

P: OK, let's get straight to it. Look at this picture and group the pictures according to their shape. What are they, sir?

LM205: rectangle, square, trapezoid, parallelogram, rhombus, and kite.

Q: Why did you group the first one as a rectangle?

LM206: easy to learn

Subjects with logical-mathematical intelligence group flat shapes based on easy-to-understand images (LM206) towards images with more complex shapes, starting from rectangles, squares, trapezoids, parallelograms, rhombuses, and kites (LM205).

Validation of Interview Data Based on TMKS I and TMKS II Logical-Mathematical Subjects in Grouping Quadrilateral Plane Shapes

Triangulation was carried out to test the validity of the logical-mathematical subject interview data in grouping rectangular flat shapes based on their shape, namely, finding the suitability of the interview data based on TMKS I and TMKS II. The triangulation in question is presented in Table 4.10

Table 4.10 Validation of Interview Data Based on TMKS I and TMKS II Logical-Mathematical Subjects in Grouping Quadrilateral Plane Shapes

TMKS-based interview 1	**TMKS II-based interview**
Subjects with logical-mathematical intelligence group flat shapes based on images that are easy to understand or simple, moving up to images with more complex shapes (LM107), namely starting from rectangles, squares, trapezoids, parallelograms, rhombuses, and kites (LM106).	Subjects with logical-mathematical intelligence group flat shapes based on easy-to-understand images (LM206) towards images with more complex shapes, starting from rectangles, squares, trapezoids, parallelograms, rhombuses, and kites (LM205).

Based on triangulation in table 4.10, it is revealed that the logical-mathematical subjects in grouping quadrilateral plane shapes based on images that are easy to understand according to the subject towards images with more complex shapes, namely starting from rectangles, squares, trapezoids, parallelograms, rhombuses, and kites. There is consistency between logical-mathematical subjects when answering interviews based on TMKS I and TMKS II in grouping quadrilateral plane shapes based on their shape. Therefore, the data obtained is valid.

4) Logical-Mathematical Subject Data Analysis in Grouping Quadrilateral Plane Buildings Based on Their Shape

Logical-mathematical subjects group images according to their shape, namely based on images that are easy to understand or images that are simple for the subject towards more complex images. The mention is consistent, starting from rectangles, squares, trapezoids, parallelograms, rhombuses, and kites. This is due to the characteristics of the logical-mathematical intelligence type, namely, working orderly and solving problems efficiently (Yaumi, 2012).

b. Exposure, Validation, and Data Analysis of Subjects with Logical-Mathematical Intelligence in the Activity of Mentioning the Properties of Quadrilateral Plane Shapes

1) Interview Data Presentation Based on TMKS I Activity Mentioning the Properties of Quadrilaterals

The following is an excerpt from an interview based on TMKS I, logical-mathematical subject:

 Parallelogram Building

P: OK, next, we will discuss parallelograms; what are the properties of parallelograms?

LM126 has four sides, a height, two pairs of parallel sides, and opposite angles that are equal.

P: Your answer is so fluent. He....

LM127: he.....

Q: Are there any other properties?

LM128: Yes.

From the results of the first interview based on the task of stating the properties of a quadrilateral,

the logical-mathematical subject stated that the properties of a parallelogram are that it has four sides, has a height, has two pairs of parallel sides, and the opposite angles are the same size (LM126).

- Rectangle Building

P: OK, let us discuss the rectangle first. Why is this shape called a rectangle?
LM109: yes, because it has the properties of a rectangle
Q: Can you mention its characteristics?
LM110: has four sides, opposite sides are the same length, has two lines of symmetry, and all four angles are the same size.
Q: Are the angles the same size? How many are they, sir?
LM111: ninety degrees.
P: OK, what other traits?
LM115: mm....Yes
From the results of the first interview based on the task of stating the properties of a quadrilateral, the logical-mathematical subject stated that the properties of a rectangle are that it has four sides, the opposite sides are the same length, it has two lines of symmetry, the four angles are the same size. The angles are ninety degrees (LM110).

- Square Shape

P: OK, let us continue. Now, let's discuss squares. What are squares' properties?
LM117: has four sides, all four sides are the same length, has four-fold and rotation symmetries, and has four equal angles.
Q: Already? Or are there other traits?
LM118: Has two diagonals of the same length
Q: What is a diagonal?
LM119: Diagonal is a line drawn from the corner of a line or angle.
Q: OK, what other traits?
LM121: Done
From the results of the first interview based on the task of stating the properties of a quadrilateral, the logical-mathematical subject stated that the properties of a square are that it has four sides, all four sides are the same length, has four lines of symmetry and rotation, has four angles of the same size (LI117), and has two diagonals of the same length (LM118).

- Build a Rhombus

Q: OK, what are the properties of a rhombus?
LM131: It has four sides, four angles, equal opposite angles, two diagonals, and two lines of symmetry.
Q: Done? Is there anything else?
LM132: Done...
From the results of the first interview based on the activity task of mentioning the properties of a rectangular shape, the logical-mathematical subject stated that the properties of a rhombus are that it has four sides, has four angles, opposite angles are equal, has one diagonal and two diagonals, has two lines of symmetry (LM131)

- Build a Kite

P: OK, finally, kites. Can you mention the characteristics of kites?
LM134: has four sides, has two diagonals, opposite angles are equal, and has 1 line of symmetry.
Q: What is the diagonal, sir? What are the sides of the kite?
LM135: the two diagonals are lengths, and the top and bottom sides differ
.
P: Oh, is that so?
LM136: YES (without any expression; his face is very flat)
Q: Are there any other characteristics?
LM137: no

From the results of the first interview based on the task of stating the properties of a

quadrilateral, the logical-mathematical subject stated that the properties of a kite are that it has four sides, the top and bottom sides are different, it has two different diagonals, a pair of opposite angles are the same size, it has one fold symmetry (LM134)

 Construct a Trapezoid

Q : Let's continue discussing trapezoids. What are the properties of trapezoids?

LM123: has four sides, a pair of parallel sides, a height and a base.

Q: it has a height and a base; what does that mean?

LM124: (students draw a trapezoid and show the bottom side as the base, and make a vertical line and name the height) This is the base; this is the height

From the results of the first interview based on the task of stating the properties of a quadrilateral, the logical-mathematical subject noted that the properties of a trapezoid are that it has four sides and there is a pair of parallel sides. It has a height and base (LM123).

Has one line of symmetry (LM226).

 Construct a Trapezoid

Q: OK, now, what is the definition of a trapezoid?

LM217: a quadrilateral that has a pair of parallel sides.

From the results of the second interview based on the task of creating a definition of a quadrilateral, the logical-mathematical subject stated that a trapezoid is a quadrilateral that has a pair of parallel sides (LM217).

4. Discussion

Authors should discuss the results and how they can be interpreted in perspective of previous studies and of the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted. The discussion should explore the significance of the results of the work, not repeat them. Avoid extensive citations and discussion of published literature. It is encouraged to cite publications from Engineering issue

In discussion, it is the most important section of your article. Here you get the chance to sell your data. Make the discussion corresponding to the results, but do not reiterate the results. Often should begin with a brief summary of the main scientific findings (not experimental results). The following components should be covered in discussion: How do your results relate to the original question or objectives outlined in the Introduction section (what)? Do you provide interpretation scientifically for each of your results or findings presented (why)? Are your results consistent with what other investigators have reported (what else)? Or are there any differences?

5. Conclusions

Based on the research results explained in the previous chapter and referring to the research questions, several things can be summarized related to the thinking profile of junior high school students in understanding the concept of quadrilaterals of students with linguistic, logical-mathematical, and visual-spatial intelligence as follows:

1. Linguistic Student Thinking Profile in Understanding the Concept of Quadrilaterals

a. The activity of grouping flat quadrilateral shapes

In grouping rectangular flat shapes, the linguistic subject sorts the images according to their shape, sorting them alphabetically to make checking which shapes still need to be included in the group easier.

b. Activity to mention the properties of quadrilaterals

The order of linguistic subjects when mentioning the properties of a quadrilateral is relatively the same, namely starting with observing the sides. However, the order is inconsistent. Some start with having four sides, all sides being the same length, having a pair of parallel lines, and having opposite sides the same length. Then, randomly, there are those who observe diagonals, corner

points, and line symmetry.

c. Activity: Making a Definition of a Quadrilateral

The linguistic subject uses a genetic definition to define a quadrilateral plane shape. In addition to understanding the image, the linguistic subject communicates the ideas in his mind in sentences.

2. Logical-mathematical thinking profile of students in understanding the concept of quadrilaterals

a. The activity of grouping flat quadrilateral shapes

When grouping images according to their form, the logical-mathematical subject sequence looks at simple or easy-to-learn or understand ones and continues with more complex ones according to the subject.

b. Activities to mention the properties of quadrilaterals

When mentioning the properties of a quadrilateral, the logical-mathematical subject sequence is by observing the sides first, and when mentioning the properties next, it is always consistent.

c. Activities to create an understanding of quadrilaterals

The logical-mathematical subject of understanding a quadrilateral plane figure uses the properties mentioned previously and consistently adds "quadrilateral figure which" at the beginning of the sentence.

3. The process of understanding the concept of quadrilaterals for students with visual-spatial intelligence

a. The activity of grouping flat quadrilateral shapes

The order of visual-spatial subjects when linking or connecting information in grouping images according to their form, namely by looking at images that are simple or easy to learn or understand and continuing with more complex ones according to the subject.

b. Activities to mention the properties of quadrilaterals

When linking or connecting information, the sequence of visual-spatial subjects, ,mentions the properties of equilateral plane shapes by first observing the line symmetry. When mentioning the properties, the subjects use teaching aids provided by the researcher, and when explaining what is meant by the subjects, they clarify with pictures.

c. Activities to create an understanding of quadrilaterals

The visual-spatial subject uses previously mentioned properties to make sense of the quadrilateral plane shape.

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