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Students' Mathematical Literacy Based On Visual Learning Style At Junior High School

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Abstrak

Literasi matematika merupakan kemampuan yang harus dimiliki siswa dalam menghadapi tantangan abad 21. Terkait dengan hal tersebut, siswa memiliki gaya belajar yang mempengaruhi cara siswa menyerap dan mengolah informasi, yaitu: Visual, auditori, kinestetik. Penelitian ini berfokus untuk mendeskripsikan literasi matematika siswa SMP pada setiap indikator yang diklasifikasikan dari gaya belajar visual. Jenis penelitian ini adalah penelitian kualitatif deskriptif. Langkah-langkah dalam penelitian ini adalah menyusun lembar angket gaya belajar dan tes literasi matematika; meminta siswa untuk mengisi angket dan tes kemampuan; menganalisis hasil angket gaya belajar dan jawaban siswa pada tes literasi matematika. Subjek penelitian terdiri dari 49 siswa kelas VIII SMP, kemudian subjek dikurangi menjadi 6 siswa. Hasil penelitian menunjukkan bahwa: 1) Siswa dengan gaya belajar visual memiliki literasi matematika berada pada rentang level 1 sampai level 2; 2) Siswa visual memiliki ciri-ciri menjawab singkat dan sulit memilih kata. Hasil penelitian ini dapat digunakan sebagai bahan pertimbangan dalam menentukan perlakuan dalam proses belajar mengajar di kelas untuk meningkatkan literasi matematika siswa.

Kata kunci: literasi matematika, gaya belajar visual

Abstract

Mathematical literacy is the ability that students must have in facing 21st-century challenges. Related to this, students have learning styles that influence the way students absorb and process information, namely: Visual, auditory, kinesthetic. This research focuses on describing the mathematical literacy of junior high school students in each indicator classified from the visual learning style. This type of research is descriptive qualitative research. The steps in this study were to compile the learning style questionnaire sheet and mathematical literacy tests; ask students to fill out questionnaires and ability tests; analyze the results of the learning style questionnaire and student answers on mathematical literacy tests. The subject of the study consisted of 49 class VIII junior high school students, and then the subject was reduced to 6 students. The findings show that: 1) Students with visual learning styles have mathematical literacy are in the range of levels 1 to level 2; 2) Visual students have characteristics of answering briefly and difficult to choose words. The results of this study can be used as consideration in determining treatment in the teaching and learning process in class to increase student mathematical literacy.

Keywords*: mathematical literacy, learning style, visual*

INTRODUCTION

The world is entering the Industrial Revolution 4.0, marked by the rapid development of digital technology and internet technology. The main vision of the Industrial Revolution 4.0 is the emergence of "smart factories," which will be connected to the production facilities of Cyber-physical systems called CPS (Lee et al., 2015). Internet of Services (IoS) and Internet of People (IoP) using the Internet of Things (IoT) will create connections: machines, machines, or humans, and at the same time, will obtain large amounts of data. These developments have had a significant effect on the world of education (Benešová & Tupa, 2017). The world of education must prepare students to face competitive changes in the 21st century. The challenges of the Industrial Revolution 4.0 must be responded to quickly and precisely to increase the Indonesian nation's competitiveness in global competition.

Therefore, the Indonesian education world requires human resources that are reliable, critical, creative, communicative, systematic, logical, and able to work together effectively. Therefore, mastering content knowledge alone is not enough to face this century (OECD, 2013; Partnership for 21st Century Skills, 2002). Skills that include critical thinking, creativity, innovation, communication, collaboration, cross-cultural and information literacy (Wijaya, 2016), problem-solving, teamwork,

decision making, media, and technology are also needed (Partnership for 21st Century Skills, 2002; Stacey, 2011).

(van Laar et al., 2017) mentioned that to face the challenges of the 21st century, there are seven core abilities that must be mastered by students, namely technical skills, information management, communication, collaboration, creativity, critical thinking, and problem-solving. These mathematical understandings are very important in realizing human resources that compete in the international world because mathematical knowledge plays an important role in solving complex problems. Therefore, individuals need to agree to use mathematics in various problem situations. This ability is called mathematical literacy.

Mathematical literacy has become an issue that has attracted the attention of researchers and educational practitioners (Kohar & Zulkardi, 2014). Mathematical literacy is the ability to understand how mathematics functions in the real world and use that understanding to make decisions in dealing with problems in everyday life (Malasari et al., 2017; Murdiyani, 2018; Nusantara et al., 2021) . This ability is the primary goal of mathematics education throughout the country (Murdiyani, 2018). In addition, five basic skills that students in learning mathematics must possess are competencies in mathematical literacy. It means that the curriculum in Indonesia refers to aspects of mathematical literacy (Oktiningrum et al., 2016) and shows that mathematical literacy is a complex ability needed by students (Malasari et al., 2017).

Likewise, in the PISA international survey study, mathematical literacy has also become a significant issue in the study. This survey is conducted every three years to test the mathematical literacy of school children aged 15 years which is carried out by the Organization for Economic Co-operation and Development (OECD). Mathematical literacy assessment is carried out on three aspects, namely: 1) a mathematical process that describes what is done to connect the context of the problem with mathematics, the context of the problem with problem-solving, and with the abilities that underlie these processes; 2) mathematical content that is targeted to be used in assessment items, basically mathematical content is the material to be measured; 3) the context in which the assessment items are located (Wilkens, 2011).

From 2003-2009, 80% of Indonesian students could only reach below the level 2 threshold of the six levels of questions tested (Kemendikbud, 2012). In 2009, almost all Indonesian students reached level 3, while only 0.1% of Indonesian students reached levels 5 and 6 (Stacey, 2010). In 2012, which placed Indonesian students in rank 64 out of 65 countries with a relatively low level of achievement, almost all Indonesian students (98.5%) in this survey were only able to reach level 3 (NCES, 2013). In that year, Indonesia only achieved a score of 375 with an average score of 494 (OECD, 2014).

PISA 2015 showed that Indonesia was in position 63 of the 69 countries that took the test with a score of 386, and this score is still far from the average of 490 (OECD, 2016). Indonesia is still in the lowest position even though Indonesia experienced an increase in achievement from the previous year (Kemendikbud, 2016).

In addition, the average achievement of mathematical literacy achieved by Indonesian students in 2015 was only 386 points. To meet the accomplishment of mathematical literacy at level 1, the score obtained must lie in the range of 258-420 topics. Indonesian students' mathematical literacy achievement at the international level is below level 2. This follows Sari's research (2015) which revealed that students could only solve problems below level 2. Then, for 2018 achievement, the average literacy score of Indonesian students only reached 379 mathematics (OECD, 2019), which means a decrease of 7 points compared to the previous year.

Indonesia's participation in PISA does not end only in average scores, ranking positions, and increases or decreases. However, it becomes feedback for reflection and improvement of the quality of education (Kemendikbud, 2018). The level of mathematical literacy is still low, and the root point of the problem that causes students to still make mistakes in solving mathematical literacy problems must be addressed immediately. This is an important issue that must be investigated in mathematics education and requires attention. It is necessary to know in-depth what conditions cause low mathematical literacy and errors experienced by students in solving mathematical literacy problems.

The increase or decrease in the achievement of Indonesian students in PISA is indirectly one of the consequences of student activities during the learning process in class. Students have their learning methods in the learning process known as learning styles. As (Ojose, 2011) said, schools have failed to produce good mathematical literacy students. (DePorter & Hernecki, 2018) state that learning styles are the key to developing performance at work, school, and interpersonal situations.

Learning style is a person's modality that has been built since humans were born (Hasrul, 2009). When teachers can recognize student learning styles, it will be easy to direct students in the learning process. Teachers and knowledge of student learning styles are also very useful for students in mastering a lesson (Bhat, 2014). As (Moussa, 2014) says, understanding the characteristics of students in each dimension will improve teaching and learning as a whole. Learning style is one of the individual differences that play an important role in learning (El Haddioui & Khalidi, 2012). Everyone has their learning style that determines how they interact with their learning environment.

According to (DePorter & Hernecki, 2018), a learning style is a combination of how a person absorbs and then organizes and processes information. Learning styles are divided into three types, namely visual, auditory, and kinesthetic. These three things are essential to know. The advantage of knowing and understanding individual learning styles is that it can help educators develop instructions to explore the potential of human resources, in this case, the potential possessed by students (Aisami, 2015; Johnson, 2008). In addition, the match between student learning styles and the way teachers teach can help motivate

students' learning processes (Pourhosein Gilakjani, 2012).

According to (Ozgen, 2013), students' mathematical literacy with their learning style should be identified thoroughly in relational and descriptive studies. (Ozgen, 2013) also suggested that further research could explore the effects of learning techniques on mathematical literacy, their relationship, and this co-effect on academic success.

Further studies are being carried out on mathematical literacy ability in terms of students' learning styles based on previous research findings. This research also conducted to define mathematical literacy skills in terms of the learning method based on mathematical literacy competence. Still, it was limited to the part of the mathematical literacy material used, namely the content of space and form.

METHOD

This research used a descriptive research method with a qualitative approach. The taking of participants in this study was based on grade level who had studied Pythagorean material, tangents to circles, cubes, and blocks, as well as pyramids and prisms. At the same time, this research aims to analyze the mathematical literacy of junior high school students in terms of visual learning styles. The research subjects were 49 students of class VIII SMP in Bandung city, and then it was reduced to 6 students. The instruments in this study used: 1) Questionnaire, 2) Written Test, 3) Interview, 4) Documentation Study.

This study collected data using learning style questionnaires, mathematical literacy tests, interviews, and documentation studies. Data analysis strategies include data analysis of learning style questionnaires, data analysis of mathematical literacy skills exams, and interview results. Data from the learning style questionnaire were analyzed by adding up the scores for each element. The highest score for each field indicates the student's learning method. The findings of students' mathematical literacy skills were assessed descriptively depending on their learning style. Interview data were examined qualitatively. The qualitative data analysis method is divided into three stages: data reduction, data presentation, and conclusions or verification.

RESULTS AND DISCUSSION

Learning Style

Learning style was determined by the questionnaire that was filled out by 49 junior high school students in the city of Bandung. The questionnaire was used to classify students' learning styles. Questionnaires were distributed to all students who attended. Before filling out the questionnaire, the researcher gave directions regarding filling out the questionnaire.

The data were analyzed according to the learning style questionnaire assessment guidelines. The following is the data on the results of the learning style questionnaire in Table 1.

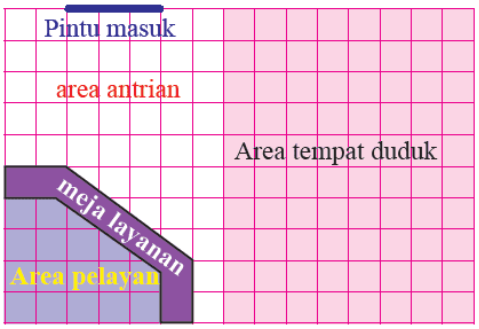
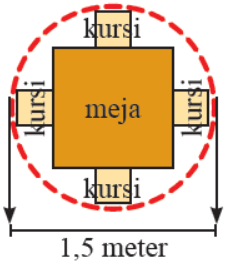
Tabel 1. Result of the student learning style questionnaire for SMP in Bandung

Learning Style	Total
Visual	5
Auditory	25
Kinesthetic	6
Auditory Visual	8
Kinesthetic Visual	3
Kinesthetic Auditory	1
Visual Auditory Kinesthetic	1

Students' Mathematical Literacy on Indicators of Applying Concepts, Facts, Procedures, and Mathematical Reasoning in Visual Learning Styles

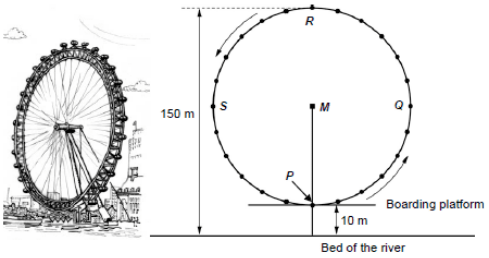
Mathematical literacy tests on indicators of applying concepts, facts, procedures, and mathematical reasoning were tested on students with a visual learning style. The time allotted for each test question is 15 minutes. Questions on applying indicators, concepts, facts, procedures, and mathematical reasoning can be seen in Table 2.

Tabel 2. Questions of Mathematical Literacy Applying Indicators, Concepts, Facts, Procedures, and Mathematical Reasoning

No	Question
1	Pak Dadang owns a restaurant in Bandung. The following is the floor plan of Mr. Dadang's restaurant.  Note: Each rectangle in the figure represents a size of 0.5 meters × 0.5 meters. Mr. Dadang wants to arrange an arrangement with 1 table and 4 chairs as in the following picture in the dining area.  Four shoppers had enough space when they sat down. Each order is represented by a dotted circle, as in the image above. Each order must be placed with the following conditions. Each arrangement must be placed at least 0.5

meters from the wall.
Each arrangement must be located at least 0.5 meters from the other arrangements.
What is the maximum number of arrangements that can be made by Mr. Dadang in the dining area? Explain!

2 A giant Ferris wheel is located by the river. Take a look at the pictures and diagrams below.



The wheel has an outer diameter of 140 meters, and the highest point is 150 meters above the riverbed and rotates in the direction indicated by the arrow. The letter M in the diagram represents the center point of the wheel. How many meters (m) is the height of point M above the river level?

The mathematical literacy test that is tested on all students who have a tendency to visual learning styles on indicators of applying concepts, facts, procedures, and mathematical reasoning consists of 2 questions. Students who tend to visual learning styles in class VIII B can answer question number 1 correctly, but students do not provide written explanations. The student's answer to question number 1 can be seen in Figure 1.

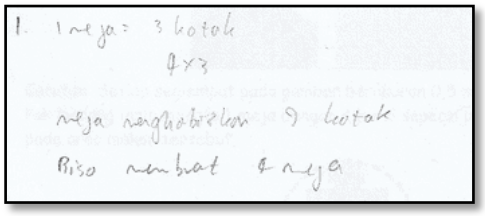


Figure 1. Student Answer VIII B Visual Learning Style Question 1

In writing, it appears that students have difficulty in explaining what they understand in their own language. The student did not apply the concept mathematically in solving the problem. The processing steps are also not systematic and there are steps missing in working on the problem. To find out more about students' mathematical literacy, the researchers conducted interviews, as illustrated in the following discourse snippet.

Q	:	Do you understand the problem presented?
S1	:	No, Ma'am
Q	:	Where is the difficulty?
S1	:	*I don't really know.*
Q	:	So, how do you do that?
S1	:	1 table is 1.5 meters, 1 box fan is 0.5 meters. So the sides have 3 squares, ma'am. Continue 1 table to spend 9 squares. So it only fits 4, ma'am

Likewise, students who have a visual learning style in class VIII D. Students give correct answers but these students do not write down the steps of working with mathematical concepts. Students also do not use mathematical procedures and facts given in the questions. Students work by making dots on the picture of the problem. To see the results of the student's work, see Figure 2.

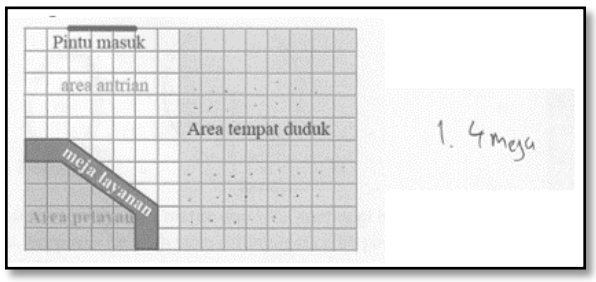


Figure 2. Student Answer VIII D Visual Learning Style Question 1

Researchers conducted interviews to dig deeper information about the students' mathematical literacy. The following is a snippet of interviews with students with visual learning styles in class VIII D (S2).

Q	:	Do you understand the problem presented?
S2	:	*Not really, ma'am.*
Q	:	Where is the difficulty?
S2	:	Confused about the size, ma'am.
Q	:	Where did you get answer 4 form?
S2	:	The size is 1.5 meters, ma'am. That means there are 3 boxes here (pointing to the box in the seating area). I continued to draw and only 4.
Q	:	Do you think your answer is correct?
S2	:	Not yet, ma'am, because from this problem.
Q	:	What is the conclusion of the problem?
S2	:	Hmmm (confused)
Q	:	How many table settings can be made?
S2	:	4, Ma'am.

This interview snippet shows that students already understand and are able to solve the problem but have difficulty in choosing diction to conclude the solution. In other words, the condition of visual students is in accordance with the characteristics of the tendency of visual learning styles, namely often answering questions with short answers and forgetting to convey verbal messages to others (DePorter & Hernecki, 2018).

Then, another mathematical literacy test was given to measure the indicators of applying concepts, facts, procedures, and mathematical reasoning. In question number 2, students have begun to recognize non-routine mathematical literacy questions to work on questions faster than before. The following is the work on question number 2 by students of class VIII B and class VIII D who tend to learn visually (see Figure 3 and Figure 4).

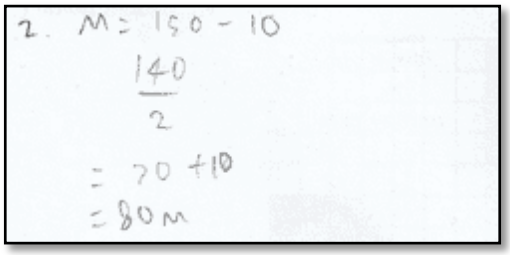


Figure 3. Student Answer VIII B Visual Learning Style Question 2

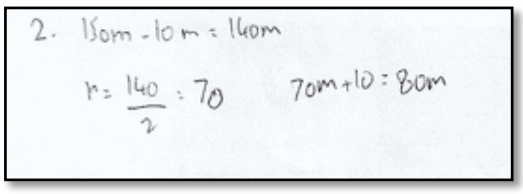


Figure 4. Student Answer VIII D Visual Learning Style Question 2

From the two pictures above, it can be seen that the visual tests performed by visual students tend to be the same. In this work, they can apply concepts, facts, and procedures problems to solve problems, but they have not been able to conclude mathematically. To confirm their answers, the researchers conducted interviews as shown below.

Q	:	Do you understand the problem presented?
S1	:	Understood, ma'am.
Q	:	Please explain!
S1	:	I subtracted 150 by 10 to find the diameter. Then the radius is 70. So, the height of the point M is 70+10=80, ma'am.

Then the visual students in class VIII D were confirmed about several things. The following is an excerpt from his interview.

Q	:	Do you understand the problem presented?
S2	:	Yes
Q	:	Please explain!
S2	:	From here to here 150 (pointing the surface of the river to point R), from here to 140 the diameter, divided by 2 for the radius, 70, plus 10.
Q	:	Oh, I see. So, what's the conclusion?
S2	:	Hmm.
Q	:	So, how high is point M above the river's surface?
S2	:	80.
Q	:	Why not write the conclusion? Are you confused about how to write it?
S2	:	Yes, Ma'am.

Every time they answer questions, students tend to be unfamiliar with making conclusions. This follows the characteristics of the visual learning style tendency, namely often answering questions with short answers and forgetting to convey verbal messages to others, and often knowing what to say, but not being good at choosing words (DePorter & Hernecki, 2018).

Based on the description above, the results of the mathematical literacy test of students who tend towards visual learning styles on indicators of applying concepts, facts, procedures, and mathematical reasoning are students who can answer questions that have a general context and are known as straightforward questions. They can identify and complete routine procedures, but they have not mastered reasoning competence because they cannot conclude a problem. In other words, students have mathematical literacy skills at level 1.

This is supported by previous research, which states that students with visual learning styles can formulate problems by identifying variables in the questions, explaining the meaning of the symbols used, determining and implementing the problem-solving strategies, using operations and symbols in mathematics, and providing conclusions on the situation (Nasifah, 2018).

However, the results of the students' mathematical literacy test in this study were different from the results of research conducted by (Nariyati, 2010), which stated that the literacy skills of students with visual learning styles were able to solve mathematical literacy problems at various levels, namely levels 1, 2, 3, 4, 5, and 6. More students answered by reaching level 5, namely finding and relating the mathematical ideas presented, formulating problems, creating mathematical models, conducting analysis to solve problems, performing a series of calculations, and communicating their opinions in writing.

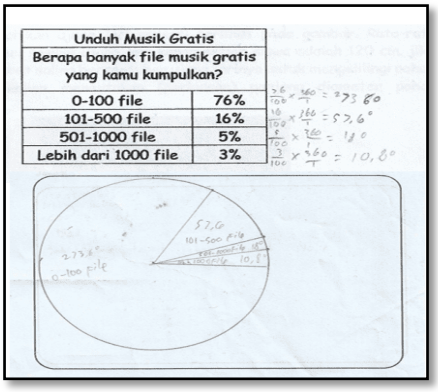
Students' Mathematical Literacy on Indicators of Formulating Mathematical Situations in terms of Visual Learning Style

Mathematical literacy tests on indicators for formulating mathematical situations tested students with visual learning styles. Students are given 15 minutes to answer 1 question. Literacy questions on indicators for formulating mathematical situations can be seen in Table 3.

Tabel 3. Questions of Mathematical Literacy Indicator Formulating Mathematical Situations

<table>
<tr><th>No</th><th>Question</th></tr>
<tr><td>3</td><td>Look at the following table. A survey was conducted online to obtain information about the number of music files owned and obtained through free downloads.
<table>
<tr><th colspan="2">Free Music Download</th></tr>
<tr><td colspan="2">How many free music files did you collect?</td></tr>
<tr><td>0-100 file</td><td>76%</td></tr>
<tr><td>101-500 file</td><td>16%</td></tr>
<tr><td>501-1000 file</td><td>5%</td></tr>
<tr><td>More than 1000 file</td><td>3%</td></tr>
</table>
If you make a pie chart from that information,
Determine each measure of the central angle of each of these categories.
Sketch the bows that fit each category.
Make a pie chart of the data.</td></tr>
<tr><td>4</td><td>Once upon a time, a class VIII junior high school student was very excited to hold a study tour to the Pasuruan Botanical Gardens. The teacher assigns students to estimate the diameter of a large enough tree. Kean, Adzano, Teguh, Deni, and Aljabar took the initiative to calculate the tree's diameter by measuring the circumference of the tree. They intertwine their fingertips, as shown in the picture. The average length from the left to the right fingertip of each student is 120 cm.
If exactly five children touch each other's fingertips to circle the tree, can you determine the (estimated) diameter of the tree?</td></tr>
</table>

The mathematical literacy test that is tested on students who tend to visual learning styles on the indicators of formulating a mathematical situation consists of 2 questions. The mathematical literacy of students tested on question number 3 was excellent and satisfying because most of them did the questions correctly. It's just that in some parts, there are answers that are not quite right. The responses of students in class VIIIB who tend towards visual learning styles in question number three can be seen in Figure 5.



Unduh Musik Gratis Berapa banyak file musik gratis yang kamu kumpulkan?	
0-100 file	76%
101-500 file	16%
501-1000 file	5%
Lebih dari 1000 file	3%

Figure 5. Student Answer VIII B Visual Learning Style Question 3

Figure 5 shows that the students correctly formulated the problem mathematically, but it was incorrect. In the picture, students can translate real-world problems into the mathematical domain, but they are not yet precise in representing them in images. The arcs in the 501-1000 file category appear smaller than those in the more than 1000 file categories. The percentage of category 501-1000 files is greater than that of categories of more than 1000 files.

Likewise, students tend towards visual learning styles in class VIII D. These students have not been able to formulate problems in the form of pictures correctly because the images made by students do not represent the size of the angle. In addition, students are still not able to communicate well. Students can do calculations well, but students cannot share the results of their interpretation with their reasons. Figure 6 below is the answer of class VIII D students who tend towards visual learning styles.

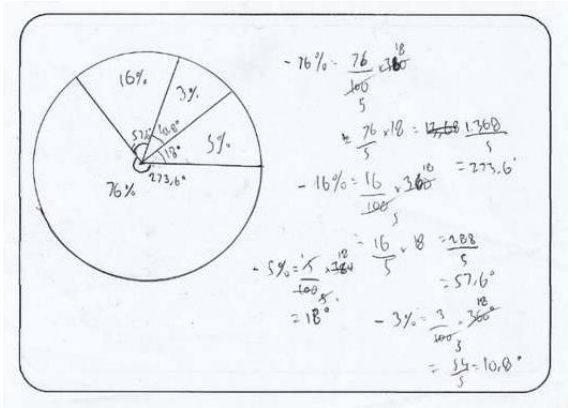


Figure 6. Student Answers VIII D Visual Learning Style Question 3

Then, the mathematical literacy test was carried out again. This also gave questions to both classes and question code number 4. The results of the visual student test in class VIII B were entirely satisfactory. Student answers follow the wishes of the researcher. The following are students' answers with visual learning styles in class VIII B (see Figure 7).

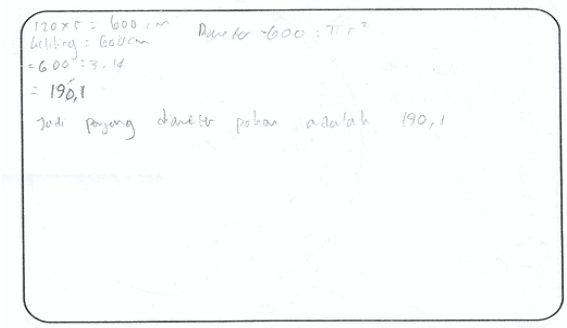


Figure 7. Student Answer VIII B Visual Learning Style Question 4

After being given this question, in general, students with visual learning styles tend to get used to dealing with non-routine mathematical literacy questions. Students can work effectively and can analyze the information provided in the questions. Students are also able to do calculations correctly. However, students still have difficulty communicating what they know and are less precise in formulating mathematical situations.

Unlike students who tend towards visual learning styles in class VIII B, students in class VIII D also tend to get used to facing questions with indicators of competence in formulating this mathematical situation. Students can understand and sort out what information is needed to solve real-world problems, and students can formulate mathematical situations. Students can communicate in mathematical expressions, but there are still errors in moving segments in multiplication. This error is called transformation (Jha, 2012; Singh et al., 2010; White, 2010). The following is the student's answer; see Figure 8.

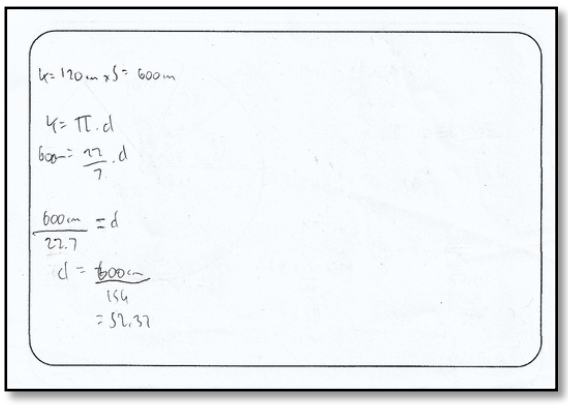


Figure 8. Student Answers VIII D Visual Learning Style Question 4

In addition, visual student errors, in general, are encoding type errors. This can be seen from the students who cannot write the final answer according to the conclusion.

Based on the description above, visual students on indicators formulating mathematical situations already recognize situations in contexts that require direct inference. They can capture relevant information from the questions. They can also work on basic algorithms, use formulas, and carry out simple procedures or conventions. However, they have not been able to communicate the results of their work in their language and provide written reasons.

Students' Mathematical Literacy on Indicators of Interpreting, Applying and Evaluating Mathematical Results in terms of Visual Learning Styles

Mathematical literacy on indicators of interpreting, applying, and evaluating mathematical results is tested on students with visual learning styles through 2 questions given one by one. The time allotted for each test question is 15 minutes. Literacy questions on indicators of interpreting, applying, and evaluating mathematical results can be seen in Table 4.

Tabel 4. Questions of Mathematical Literacy Indicators of Interpreting, Applying and Evaluating Mathematical Results

No	Question
5	It is known that the center distance of the gear axis on Pak Indra's bicycle is 70 cm. Pak Indra wants to attach a 170 cm long chain to a gear with a diameter of 15 cm for the rear gear and 10 cm for the front gear. Will the chain installed by Mr. Indra match the gear? Explain!
6	A pizza shop provides two types of pizza with different sizes but has the same taste and thickness. A pizza with a diameter of 30cm is sold for Rp. 30,000-, and a large one with a diameter of 40 cm is sold at Rp. 40,000-. Is selling a pizza with a diameter of 40 cm more profitable than a pizza with a diameter of 30 cm? Explain!

The mathematical literacy test on students who tend towards visual learning styles on indicators of interpreting, applying, and evaluating mathematical results consists of 2 questions, as shown in Table 4. The answers of visual students in class VIII B can be seen in Figure 9.

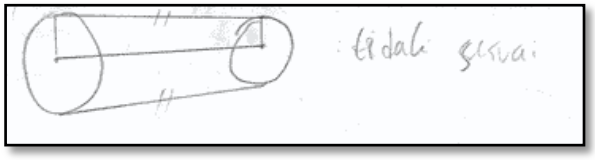


Figure 9. Student Answers VIII B Visual Learning Style Question 5

Based on Figure 9, it can be seen that students only gave the final result but did not give a general basis or explanation at all. Therefore, the researchers conducted interviews with these students. The following is a snippet of the interview.

Q	:	Do you understand the problem presented?
S1	:	No, Ma'am
Q	:	What difficulties?
S1	:	*I don't know how, ma'am.*
Q	:	Try to explain what you know!
S1	:	(Silent)

Based on student answers and interviews, students did not understand what was asked in the questions. The student's error is a reading type error. This can be seen from students not being able to read or recognize the words in the questions, and students are also unable to interpret the meaning of each word in the questions (Jha, 2012; Singh et al., 2010; White, 2010).

At different times and places, students with visual learning style tendencies in class VIII D are better able to work on questions even though the answers are still not correct. The responses of visual students in class VIII D can be seen in Figure 10.

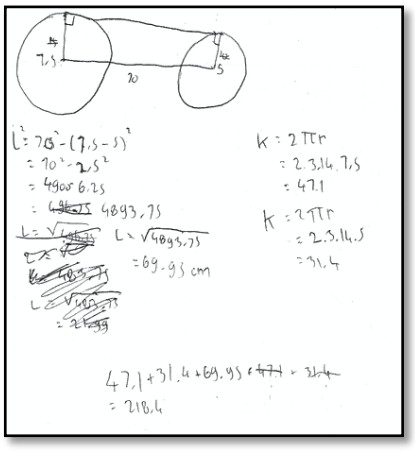


Figure 10. Student Answers VIII D Visual Learning Style Question 5

In Figure 10, students take several steps to solve the problems presented. First, students apply the Pythagorean formula to find major lines. Then, students find circles and small circles. Then students add up the results of the three.

To understand the answers written by students, the researcher interviewed visual class

VIII D students. The following is a snippet of the interview.

Q	:	Do you understand the problem presented?
S2	:	Understood, ma'am.
Q	:	What's the problem? Explain!
S2	:	Suitable or not (with supplied chain)
Q	:	Are there any difficulties?
S2	:	*No really*
Q	:	How do you solve the problem?
S2	:	Find this length first (the tangent to the outer circle), this (large circle), this (small circle).
Q	:	What the formula that you use?
S2	:	This is Pythagoras.
Q	:	So, how?
S2	:	The results are all added up.
Q	:	Is your reasoning correct?
S2	:	That's almost correct, ma'am.

After going through the interview, it turned out that the students had not answered the questions correctly. Students do not understand the meaning of the chain in real life. A chain is represented as something made up of two tangents to the outer circle, half the circumference of the large circle and half of the rim of the smaller circle.

The student's error in answering the questions lies in the process skill stage. It supported several previous researches that mentioned in this process showed that a few students do not know the procedure or steps to solve the problem correctly (Jha, 2012; Singh et al., 2010; White, 2010).

Based on the answers and interview results, the researcher analyzed that student provided illustrations through gear images. Students knew the nature of the problems presented, but the arguments were weak and wrong. Students can only answer questions whose context is general and known, and all relevant information is available with straightforward questions.

Then the researcher gave the following question to the visual students in both classes. The results of student answers can be seen in Figure 11.

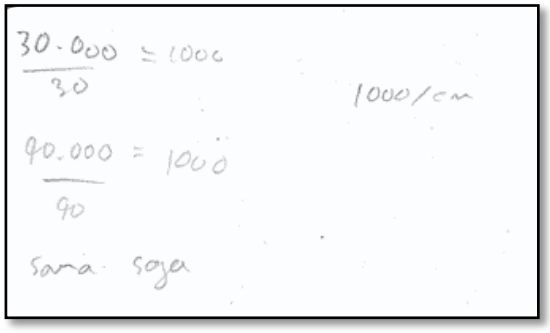


Figure 11. Student Answers VIII B Visual Learning Style Question 6

Based on the students' answers in Figure 11, students worked on the questions using comparisons. Students explain that if pizza is sold for Rp. 30,000/30cm, the price of pizza is Rp. 1,000/cm. Likewise for pizza which is sold at Rp. 40,000/40cm, the students assume that the price of the pizza is also Rp. 1,000/cm.

The researcher analyzed that the students made mistakes in the type of understanding. In similar cases, several researchers identified that students did not understand what information is known, and students do not fully understand what is understood in the questions (Jha, 2012; Singh et al., 2010; White, 2010). This is because students did not realize that the problem is how much pizza is per unit area, not per unit length.

Meanwhile, visual students in class VIII D did not explain their answers mathematically. For this reason, researchers conducted interviews with these students to explore information about their understanding. The responses of visual students in class VIII D can be seen in Figure 12.

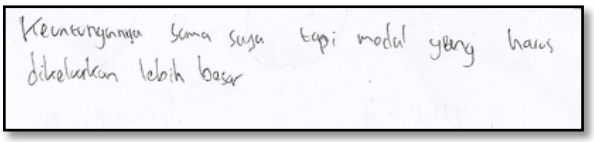


Figure 12. Student Answers VIII D Visual Learning Style Question 6

The results of student answers and interviews showed that visual students in class VIII D were the same as visual students in class VIII B. This student also had the same error, namely, the comprehension type. That is, students are not able to understand what information is known in the question entirely and do not understand what the meaning of what is being asked in the question is. (Jha, 2012; Singh et al., 2010; White, 2010).

Based on the characteristics found in the field, the researcher saw that students could answer questions about the general and known context, and all relevant information was available with straightforward questions. They can identify information and complete routine procedures according to explicit instructions. They can take action according to the given stimulus. The researcher concludes that visual students on the indicators of applying, applying, and finding mathematical results have not mastered this indicator. The students' mistakes in answering questions were errors in the type of reading and comprehension.

CONCLUSION

Based on the analysis of the results of the mathematical literacy test, several conclusions were obtained as follows: 1) The results of the analysis of students' mathematical on indicators of applying, concepts, facts, procedures, and mathematical reasoning, with the tendency of visual learning styles is at level 1. The characteristics of being able to answer questions in the general context, able to identify information & solve routine problem, and have not mastered the competence of reasoning. 2) The results of the analysis of students' mathematical literacy on the indicators of formulating mathematical situations with the tendency of visual learning styles is at level 2 with the characteristics of being able to recognize situations in contexts that require direct inference, able to capture relevant information from questions, able to work on algorithms. Basic skills, use formulas, carry out simple procedures or conventions but have not been able to communicate the results of their work in their language and provide written reasons. 3) The results of the analysis of students' mathematical literacy on the

indicators of interpreting, applying, and evaluating the mathematical results with the tendency of visual learning styles to be at level 1 with the characteristics of being able to answer questions whose contexts are common and known. All relevant information is available with the questions asked. Precise, able to identify information and complete routine procedures according to explicit instructions, able to take action according to the given stimulus, and visual students have not mastered this indicator.

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