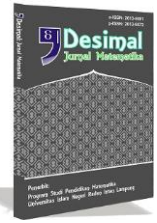




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Mathematical literacy analysis of climbers-type students in high school students

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ABSTRACT

Mathematics literacy is the ability of students to formulate, use and interpret mathematics in various contexts and hone reasoning. This helps the person to recognize the role of mathematics in life and to make judgments and decisions in a real and systematic way. This research aims to describe the Mathematics Literacy Ability of Climbers Type Students in High School Students. This school is one of the schools that applies PISA (Lesson from PISA) questions so that students at that school are familiar with such questions. This research is a descriptive research with a qualitative approach designed to determine the mathematics literacy ability of Climbers Type students based on their mathematics ability. Based on the results of the research, both subjects have the same mathematical literacy skills at levels 1 to 3, namely at level 1 both male and female subjects (a) Answer according to the relevant context and all relevant information, (b) Identify information and perform common ways based on clear instructions, (c) Shows an action according to the given stimulation. At level 2 both subjects were able (a) Interpret, (b) Choose relevant information, (c) Working on basic algorithms, using formulas, executing procedures or agreements, (d) Give proper reasons. At level 3 both subjects were able, (a) Carry out procedures clearly, (b) Solve the problem, (c) Interpret and use representations based on different sources of information, (d) Communicate the result of their interpretations and reasons. The difference in the ability of the two subjects lies in the steps in solving the problem. Female subjects answered in their own way and the settlement procedure used was incomplete while male subjects solved the problem in more detail according to the procedure.

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INTRODUCTION

Mathematics is one of the sciences that can develop students' critical and creative thinking skills. Creative thinking skills are needed to produce competitive

Human Resources (HR) in the Industrial Revolution Era 4.0. Many problems in everyday life can be solved using mathematics (Permatasari et al., 2015). Senthamaria et al. (2016), suggest that

problem-solving is the heart of mathematics. Dinni & Isnarto (2018) reveals that mathematics is a science that can be used by students to solve problems in everyday life, but to solve existing problems students must know the correlation between the problem and mathematics itself. This is supported by the existence of basic skills in mathematics that must be mastered by students, namely problem solving abilities (Mardika & Insani, 2017). Problem-solving ability is one of the important skills that must be mastered in learning mathematics (Kurniawati et al., 2017) and students' mathematics problem-solving abilities are very important to develop. Fauziah & Sukasno (2015) stated that problem-solving ability is one of doing math (mathematics skills) which can be classified as higher-order thinking skills. Problem-solving ability is a person's basic ability to identify and solve problems which include critical, logical, and systematic thinking (Susanti et al., 2017). According to the National Council of Teachers of Mathematics (NCTM) (2000, cited in Abidin et al., 2017) determine 5 mathematics abilities in learning mathematics. These five abilities must be mastered by students after learning mathematics, namely mathematics reasoning, mathematics representation, mathematics connections, mathematics communication, and mathematics problem-solving. These five abilities are very important to be mastered because they are related to the need to solve problems faced in everyday life. To support the development of the five mathematics abilities, mathematics literacy is needed. Therefore, mathematics literacy can make it easier for someone to understand the usefulness of mathematics.

Mathematics literacy is the ability of students to formulate, use and interpret mathematics in various contexts. Mathematics reasoning includes the use of

Mathematics concepts, procedures, facts, and tools to describe, explain and predict phenomena. This helps a person to recognize the role of mathematics in life and to make judgments and decisions in a real and systematic way (Syawahid & Putrawangsa, 2017).

Students' Mathematics literacy is measured by participating in a program that specifically examines Mathematics literacy, one of which is PISA. PISA has conducted surveys since 2000 and is held every three years (OECD, 2012). Indonesia participates in every survey conducted by PISA. The results of PISA research in 2018, Indonesian students' math scores were ranked 72 out of 78 countries with an average score of 379. In 2018, PISA assessment, data obtained that about 28% of students in Indonesia reached level 2. The results of the 2018 PISA assessment showed that less than 50% of students in Indonesia were only capable at level 2. This is a reference that Indonesia has low Mathematics literacy (OECD, 2019).

Some Indonesian researchers also found low literacy skills of students in various regions of Indonesia, such as research conducted by Setyawati & Nursyahida (2017) The results obtained with the category of Mathematics knowledgeability only reached level 1. These results are also influenced by several factors, including; 1) the selected material 2) the learning provided by the teacher 3) the classroom environment 4) the support of the family environment 5) readiness in carrying out the test and 6) the abilities of each student himself seeing the problems and facts that had been described, the researcher tried to analyze the mathematical literacy skills of climber type students or students who have a high Adversity Quotient. Stoltz (2005) states that the Adversity Quotient has three levels, namely

1. *Quitters* or people who quit, meaning people who back off, stop in the face of adversity. Quitters reject all forms of

challenges in life. They choose to run from challenges and ignore their potential. These quitters are people who have a low AQ.

2. *Campers* or people who are willing to take on a challenge to a certain degree and then quit because they are quite satisfied with what they have achieved or because they are tired of dealing with hostile situations. Campers are easily satisfied with what has been achieved and ignore all possibilities that can still happen. They give up opportunities for advancement that can be achieved if the energy and resources they have been directed to the maximum. These campers are people who have a moderate AQ.
3. *Climbers* or the climber, it means people who in their lives are constantly trying to make improvements. Climbers welcome the challenges in life and always think about the possibilities to get through the difficulties in life. Climbers are very persistent and tenacious in the face of adversity. When they hit a dead-end, they will immediately find another way. When feeling tired in trying to come, they will continue to introspect and persist. Climbers go through adversity with true courage and discipline. These climbers are people who have a high AQ. In accordance with research conducted by Wicaksono et al. (2021) that AQ in the climber category can solve problems to the stage of re-checking the answers that have been obtained and there are differences between male and female students, namely in the Polya step at the stage of re-checking the answers. The difference is that this research focuses more on ARIAS learning with a scaffolding strategy. This is also in line with research conducted by Wahyuningsih (2019) which states that climbers type students in solving the problem are able to write down

information that is known and asked correctly. At the planning stage of problem-solving, climber students can write down supporting data to be used in problem-solving, such as writing formulas to the final plan. In the process of implementing problem-solving planning, climber students are able to carry out problem-solving plans well. Climber students experienced significant difficulties and were able to solve them according to what they had planned. Climber students also write down the units for each calculation and the results of the calculation are also correct. At the re-checking stage, climber students re-checked independently and more thoroughly. The difference in this research is that it focuses more on mathematical problem-solving abilities in terms of adversity quotient in the guided discovery learning model with a metacognitive approach assisted by Schoology.

In this research, the variable is the Adversity Quotient type Climbers or individuals who have I. Researchers chose Climbers because the PISA questions are international questions that can only be solved by students who find difficulties and challenges and never give up and have many ways to find the answers. The purpose of this research is to make students familiar and able to work on PISA questions.

METHOD

The type of research used was descriptive qualitative research. This researcher adapted the Adversity Response Profile (ARP) developed by Stoltz (2005) by adjusting the condition of high school students to determine the research subject. Determination of research subjects based on the results of the ARP (*Adversity Respond Profile*). Subjects in this research selected climbers-type students. The location of

this research was SMA Negeri 1 Takalar, the school was one of the leading schools in Takalar Regency, South Sulawesi.

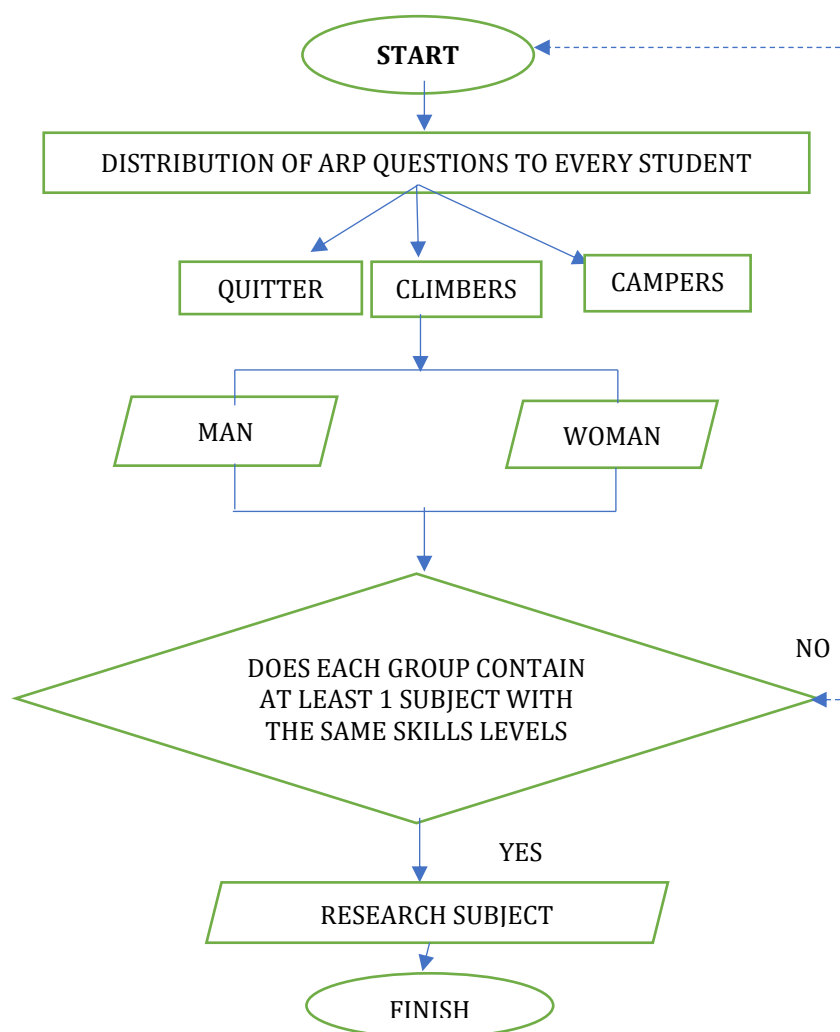


Figure 1. Subject Determination Flowchart

The instruments used in this research are: (1) ARP Questionnaire, (Stoltz, 2005) ARP (*Adversity Respond Profile*) is a tool to measure a person's AQ (Adversity Quotient). The ARP questionnaire was adopted from Stoltz (2005) which had been translated but after going through validation, the ARP questionnaire was considered too difficult for students to understand, so the authors revised the questionnaire again but still guided it by standard ARP questionnaire. (2) Interview guidelines are used to find out more in-depth things from respondents. (3) Mathematical literacy

test, the test used is a collection of PISA (*Programme for International Student Assessment*) questions that have been translated and adapted to the context. The PISA questions used are PISA questions in 2012 starting from level 1, level 2, and level 3.

The following is the PISA test instruments used in the research:

1. Chris just got a car license and wants to buy a car, here is a detailed list of the cars he saw on the nearest dialer:

Table 1. Car Details List

Model	Nissa March	HondaFreed	Toyota AvanzaVeloz	NissanSerena
Old	2011	2012	2013	2014
Price (In rupiah)	91 million	182 million	159 million	270 million
Kilometers	44000	50000	50000	22000
Capacity Machine	1200 cc	1500 cc	1500 cc	2000 cc

Chris wanted a car that met all these requirements: (a) The distance covered is not higher than 50000 kilometers, (b) Made in 2012 or a year later, (c) The advertised price is not higher than 162 million. Cars that meet Chris's requirements are...

2. Mount Fuji is a famous active volcano in Japan.



Figure 2. Fuji Mountain

The small road called Gotemba that goes to the top of Mount Fuji has a length of about 9 km, a climber must return by 8:00 p.m., from an 18 km climb Hiker Toshi estimates that he can climb the mountain at an average speed of 1.5 km per hour, and twice as fast when descending. This speed includes meal times and breaks. Using Toshi's estimated speed, at what time should he start the ascent at the latest so he can return by 20:00 p.m.?

3. What is the approximate length of the rope to pull the ship at an angle of 45° and be at a vertical height of 150m, as shown in the figure below?

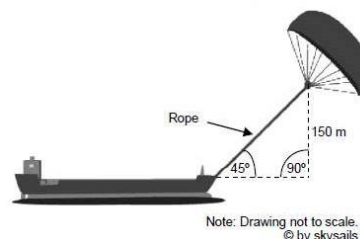


Figure 3. The Ship

Table 2. Categorization of AQ based on ARP

Score	Category/Type
>59	Quitters
60-94	Quitters-Campers
95-134	Campers
134-165	Campers-Climbers
166-200	Climbers

Source: (Stoltz, 2005)

In this research, the technique used in data collection was to give an ARP test to get climbers-type subjects, then to give a literacy test using revised PISA questions, after which interviews were conducted to explore students' understanding of the questions given. The validity of the data used in this research is time triangulation.

RESULTS AND DISCUSSION

This research was conducted at SMA Negeri 1 Takalar. The activity of taking the Adversity Response Profile (ARP) questionnaire was carried out in class X MIA SMA Negeri 1 Takalar on Monday, September 13, 2021, and was attended by 30 students. The choice of this subject referred to the results of the highest score on the ARP questionnaire and then was strengthened by the results of the interviews of the selected subjects. In addition, the subjects were able to

communicate well when expressing their opinion/ideas orally or in writing and the subject was willing to participate in the entire data collection process in this research. The selected research subjects were presented in Table 3.

Table 3. Selected Research Subjects

No	Student's name	Score	Type AQ
1.	Fatahillah Nur Fadhilah	166	Climbers
2.	Nurul Inayah Putri Ashari	169	Climbers

To facilitate the activities of analyzing the data, each excerpt of the interview dialogue, whether it was a question from the researcher or the subject's answer in the interview transcript, it was given a certain code. The excerpt code of the subject's answer consisted of 6 (six) digits starting with the letters "SL" and "SP" which stated that the male subject was "SL" and the female subject was "SP". Then followed by a 4

(four) digit number. The fourth digit stated the order of the questions, and the last 3 (three) digits stated the order in which the answers were quoted for each question. For example, the answer passage "SL1-002" stated the second-order answer on task 1 by a male subject. While the interviewer code on the transcript was coded with P and only consisted of 5 (five) digits. Which began with the letter "P", then the 4th (fourth) digit represented the order of the assignment and the last 3 (three) digits represented the sequence of questions in each question. For example, the excerpt of the question "P1-003" stated the 3rd order question on task 1 by the interviewer.

Data Exposure and Validation

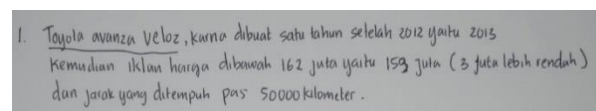


Figure 4. Answers to SP Test Results Number 1

Table 4. SP Interview Excerpts on Answer Number 1 of Level 1

Code	Researcher questions and subject answers
P1-001	Nurul, do you understand the meaning of question number 1?
SP1-001	Subject nodded and said "Understood Sist"
P1-002	The answer for number one?
SP1-002	Toyota Avanza Veloz
P1-003	Then what was the reason, why the answer was Toyota Avanza Veloz?
SP1-003	Because it met the requirements in the question
P1-004	So where did you get the information from?
SP1-004	Table in the question

In Figure 4, the female climber-type subject answered the question correctly, namely the Toyota Avanza Veloz, because it was made one year after 2012, namely 2013, then the advertisement was priced below 162 million, which is 159 million (3 million lower) and the distance traveled was 50000 kilometers. While in Table 2 the subject answered the question correctly, namely the Toyota Avanza Veloz (SP1-002) because it met the requirements in the question (SP1-003).

Based on the comparison of the answers to the test results and interview transcripts on question number 1 in the level 1 category, although there was a slight difference, there is no substantial difference. So, it can be concluded that there was consistency in the subject's answers so that the answers to the level 1 test results were considered valid. Furthermore, the valid data would be analyzed.

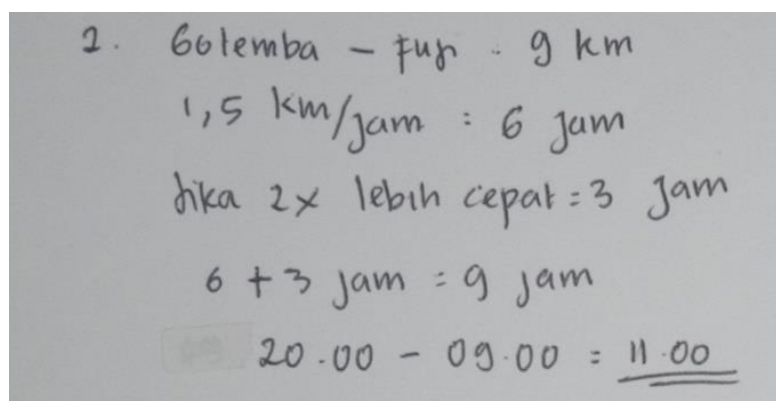


Figure 5. SP Result Test Answer Number 2

Table 5. SP Interview Excerpts on Answer Number 2 of Level 2

Code	Researcher Questions and Subject Answers
P2-001	Do you understand the meaning of question number 2?
SP2-001	Subject nodded and said "Understood"
P2-002	Can you explain the steps in solving problem number 2?
SP2-002	The subject quickly read the questions and explained fluently "The distance from Gotemba to Fuji is 9 km, then a hiker named Toshi estimated that he could climb the mountain at an average speed of 1.5 km/hour, meaning to reach 9 km took 6 hours, then he said he would reach twice as fast as when descended. Means 2x faster than 6 hours means 3 hours (meaning equal to 3 hours).
P2-003	I mean 2x faster than 6 hours why the result was 3 hours?
SP2-003	The subject was silent for a moment and reread the question and then continued to explain smoothly "eeeeee, twice as fast, the time is 2x faster if it goes down, it means that if it is 2x faster than 6 hours, it means that it is getting less, the time it takes to go down means 3 hours. Continue, so to go up and down to the top of the mountain takes 9 hours. Because climbers must return at 20.00 or 8 pm, climbers must start climbing at 11 noon at the latest at 11.
P2-004	Yes. So, this was the answer for number 2. Are you sure at 11 o'clock?
SP2-004	Firmly and confidently the subject said "Sure"

Based on Figure 5, the female subject of the climber type answered question number 2 correctly at 11.00. procedure: Gotemba - Fuji = 9 km, 1.5 km/hour = 6 hours, If 2x faster = 3 hours, 6 + 3 hours = 9 hours, 20.00 - 09.00 = 11.00. While in table 3 above the subject also answered question number 2 correctly, which was no later than 11 noon (SP2-003), the subject quickly read the question and explains smoothly "The distance from Gotemba to fuji is 9 km, then a pedestrian named Toshi estimated that he could climb the mountain at an average speed of 1.5 km/h, meaning that it would take him 6 hours to reach 9 km, then he said he would reach twice as fast when descending. Means 2x faster than 6 hours means 3 hours (means equal to 3 hours)

(SP2-002), The subject thought for a moment and re-read the question and then continued to explain smoothly "eeeeee, twice as fast, the time is 2x faster if it goes down, it means that 2x faster than 6 hours means less time it takes to go down means 3 hours. So, to go up and down to the top of the mountain takes 9 hours. Because climbers must return at 20.00 or 8 pm, climbers must start climbing at 11 noon at the latest at 11 (SP2-003).

Based on the comparison of the answers to the test results and interview transcripts on question number 2 for the level 2 category, although there was a difference in terms of explanation, the interview was clearer, but substantially there was no difference. It can be

concluded that there was consistency in the subject's answers so that the answers to the level 2 test results were considered

valid. Furthermore, the valid data was analyzed.

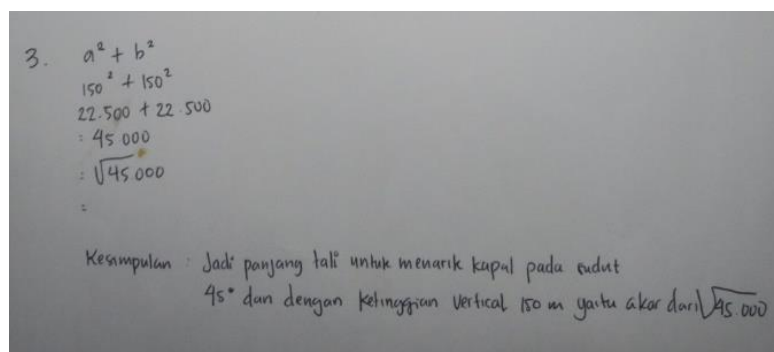


Figure 6. SP Result Answer Number 3

Table 6. SP Interview Excerpts on Answer Number 3 of Level 3

Code	Researcher Questions and Subject Answers
P3-001	Do you understand the question from Pisa problem number 3?
SP3-001	Understand
P3-002	Are you sure about the answer?
SP3-002	Yes (the subject is a little hesitant to answer)
P3-003	Why are you doubting? Are you sure or not?
SP3-003	The subject laughed for a moment then said "Sure, but because it did not, the final result was not obtained"
P3-004	Ummm, trying to explain how the steps were carried out, how come the results were like that?
SP3-004	The subject thought and then read the question and the answer "Use the Pythagorean formula, Sis, you used the Pythagorean formula anyway, Sis, keep raising it to the power of 2, +, because here it is 150 meters (vertical length), the automatic elbow here is also 150 meters (horizontal length). Means + i.e., $22500+22500 = 45000$, then we look for the root but I don't get $a^2+b^2=150^2+150^2=\sqrt{45000}$ "
P3-005	Why did you assume the length on the other side is 150 meters if here the angle and length are 150 meters below? 90°
SP3-005	Ummmm, because you continue here, it also means that here it also means that it is the same as going up, and this is also the same at the bottom (meaning the length at the bottom and the length at the top). $90^\circ 45^\circ 45^\circ$
P3-006	So, the conclusion?
SP3-006	So, the length of the rope to pull the ship at an angle and a vertical height of 150 meters is $45^\circ\sqrt{45000}$

Based on Figure 6, the female subject of the climber-type answered by using the Pythagorean formula. $a^2 + b^2 = 150^2 + 150^2 = 22500 + 22500 = 45000 = \sqrt{45000}$. While in Table 6 the subject answered (SP3-006), the subject thought and then read the question and the answer "Use the Pythagorean formula, sis, use the Pythagorean formula anyway, Sis, continue to be raised to the power of 2, +, because here it is 150 meters (vertical

length), right-angled. The automatic elbow here is also 150 meters (horizontal length). It means + i.e., $22500+22500 = 45000$, then we look for the root but I cannot find it" (SP3-004).

Based on the comparison of the answers to the test results and interview transcripts on question number 3 in the level 3 category, although there was a difference in terms of explanation, the

interview is clearer, but substantially there was no difference. It can be concluded that there was consistency in the subject's answers so that the answers to the level 3 test results were considered valid. Furthermore, the valid data was analyzed.

In this section, the data for the female climber-type subject was analyzed in question number 1 which was level 1. Data analysis was carried out in the following order: (1) data classification, (2) data reduction, (3) data presentation, (4) data interpretation, (5) drawing conclusions. Classification of data is carried out according to the category of mathematical literacy ability. Data that is not used will be reduced and otherwise, the data used to answer the research problem formulation that will be presented is then interpreted. While the results of the interpretation will be used to draw a conclusion. The following is the process of data analysis carried out according to mathematical literacy skills based on level 1.

The subject's answers from the PISA test results and interview excerpts on level 1 category questions were correct and the reasons were correct (Figure 1, SP1-002 and SP1-003) from the data it can be concluded that the female climber type subject is able to answer level 1 questions.

In this section, the data for the female climber-type subject was analyzed in question number 2 which is level 2. Data analysis was carried out in the following sequence: (1) data classification, (2) data reduction, (3) data presentation, (4) data interpretation, (5) drawing conclusions. Classification of data was carried out according to the category of mathematical literacy ability. Data that is not used will be reduced and otherwise, the data used to answer the research problem formulation that will be presented is then interpreted. While the results of the interpretation will be used to draw a conclusion. The following is the process of data analysis

carried out according to mathematical literacy skills based on level 2.

The subject's answer from the test results and interview excerpts on level 2 category questions were exactly at 11.00, but this SP subject has its own procedure in solving question number 2 (Figure 2, SP2-002 and SP2-003) from the data it can be concluded that the female subject of the climber type was able to answer level 2 questions.

In this section, the data for the female climber-type subject was analyzed in question number 3 which is level 3. Data analysis was carried out in the following sequence: (1) data classification, (2) data reduction, (3) data presentation, (4) data interpretation, (5) drawing conclusions. Classification of data is carried out according to the category of mathematical literacy ability. Data that is not used will be reduced and otherwise, the data used to answer the research problem formulation that will be presented is then interpreted. While the results of the interpretation are used to draw a conclusion. The following is the process of data analysis carried out according to mathematical literacy skills based on level 3.

The subject's answer from the test results and interview excerpts on level 3 category questions is to answer with the appropriate and correct procedure, namely using the Pythagorean formula but not completing the answer to the end, only arriving at (Figure 3, SP3-003 and SP3-005) from the data it can be seen. it was concluded that the female subject of the climber type was able to answer level 3 questions. $\sqrt{45000}$

In this section, the data for the climber-type male subject was analyzed in question number 1 which is level 1. Data analysis was carried out in the following order: (1) data classification, (2) data reduction, (3) data presentation, (4) interpretation. data, (5) drawing conclusions. Classification of data is carried out according to the category of

mathematical literacy ability. Data that is not used will be reduced and otherwise the data used to answer the research problem formulation that will be presented is then interpreted. While the results of the interpretation will be used to draw a conclusion. The following is the process of data analysis carried out according to mathematical literacy skills based on level 1.

The subject's answers from the test results and interview excerpts on level 1 category questions are correct and the reasons are explained clearly according to the wishes of Chris's level 1 questions.

In this section, the data for the climber-type male subject was analyzed in question number 2 which is level 2. Data analysis was carried out in the following order: (1) data classification, (2) data reduction, (3) data presentation, (4) interpretation. data, (5) drawing conclusions. Classification of data is carried out according to the category of mathematical literacy ability. Data that is not used will be reduced and otherwise the data used to answer the research problem formulation that will be presented is then interpreted. While the results of the interpretation will be used to draw a conclusion. The following is the process of data analysis carried out according to mathematical literacy skills based on level 2.

The subject's answer from the test results and interview excerpts on question number 2 for the level 2 category is correct at 11.00 by using the appropriate formula in the processing procedure (Figure 5, SL2-003) from the data it can be concluded that the male subject of the climber type is able to answer level questions 2.

In this section, the data for the climber-type male subject was analyzed in question number 3 which is level 3. Data analysis was carried out in the following order: (1) data classification, (2) data reduction, (3) data presentation, (4)

interpretation. data, (5) drawing conclusions. Classification of data is carried out according to the category of mathematical literacy ability. Data that is not used will be reduced and otherwise the data used to answer the research problem formulation that will be presented is then interpreted. While the results of the interpretation will be used to draw a conclusion. The following is the process of data analysis carried out according to mathematical literacy skills based on level 3.

The subject's answer from the test results and interview excerpts on question number 3 category level 3 is correct with the final result of the meter and the appropriate procedure using the Pythagorean formula (Figure 6, SL2-002) from the data it can be concluded that the climber-type male subject is able to answer the questions on level 3. $150\sqrt{2}$

From the research data above, this research focused on several things, namely: the mathematics literacy ability of female students of the climber type, and the mathematics literacy ability of male students of the climbers-type.

Mathematical Literacy Ability of Female Climbers in the level 1 category. In question number 1 which is a level 1 category, the subject is able to answer questions correctly and with the right reasons according to the information contained in the questions. Meanwhile, male students were able to answer questions correctly and with the right reasons according to the information contained in the questions.

In question number 2 which is a level 2 category, female students were able to answer questions correctly using their own working procedures or their own way of working without using sequential formulas and lengthy procedures. the subject has an independent nature in answering this question. Meanwhile, male students were able to answer questions

correctly using appropriate working procedures and using general formulas.

In question number 3 which is a level 3 category, female students, the subject answered questions with appropriate and correct procedures and formulas, but the subject did not complete the procedure until the end, namely until he found the results of the subject determines the size of the angle and the length of the unknown side through his own estimation. The subject also provides a final conclusion sentence in the answer. Meanwhile, the male students were able to answer the questions correctly according to the working procedure and the appropriate formula. The subject is very familiar with the material related to the problem. $\sqrt{45000}$

SP and SL are both able to answer questions correctly and with the right reasons according to the information contained in the questions.

SP and SL have the same final answer but differ in the working procedure. SP answered in their own way or independently, while SL answered with the appropriate formula and procedure.

SP and SL both can answer with the appropriate procedure. However, SL is very familiar with material related to questions compared to SP. SL also completes the procedure to the end whereas SP does not.

This is in accordance with the research conducted by Darojat & Kartono (2016) explaining that climber students can understand the problem well. Based on the research of Mena (2016) that the climber type subject can design and apply strategies to find mathematical solutions, by writing down what is known and what is asked in the problem, writing down the formula to be used, replacing variables with known values into formulas, applying arithmetic operations and previously known concepts. . The results of Pratiwi (2016) say that climber students are able to re-examine by writing down how to re-

examine the results and the process of concluding the completion results. Kurniawan et al. (2015) research results say that climber students can explain the strategies used to solve problems. While the research results obtained by Rahmawati et al. (2015) that climbers students fulfill all aspects, namely aspects of reasoning, argumentation, communication, modeling, connections, and representation.

CONCLUSIONS AND SUGGESTIONS

Based on the results of research and data analysis that has been described in the previous chapter, it can be concluded that: Both subjects have the same mathematical literacy skills at levels 1 to 3, namely at level 1 both male and female subjects (a) Answer according to the relevant context and all relevant information, (b) Identify information and perform common ways based on clear instructions, (c) Shows an action according to the given stimulation. At level 2 both subjects were able (a) Interpret, (b) Choose relevant information, (c) Working on basic algorithms, using formulas, executing procedures or agreements, (d) Give proper reasons. At level 3 both subjects were able, (a) Carry out procedures clearly, (b) Solve the problem, (c) Interpret and use representations based on different sources of information, (d) Communicate the result of their interpretations and reasons. The difference in the ability of the two subjects lies in the steps in solving the problem. Female subjects answered in their own way and the settlement procedure used was incomplete while male subjects solved the problem in more detail according to the procedure.

Referring to the description of the discussion of the research results and conclusions above, it can be suggested to: Teachers should give students exercises on math literacy questions (PISA questions) and the teacher or teacher

should also be very familiar with PISA questions and their material.

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