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Description of Numeracy Literacy Skills in Science Learning

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Abstract
This research is a descriptive study with a quantitative approach with a survey method to describe the numeracy literacy skills of each question answered by 7th grade students of SMP IT wahdah islamiyah Makassar. The purpose of this study was to determine the level of numeracy literacy skills of 8th grade students at SMP IT Wahdah Islamiyah Makassar. The population of this study were all 8th grade students at SMP IT Wahdah Islamiyah Makassar consisting of 3 classes with a total of 89 students. The sample was selected using saturated sampling technique so that the determination of the sample when all members of the population were used as samples and the number of research samples was 89 students. The research instrument is a numeracy literacy test instrument totaling 14 questions. The data collection technique is by giving tests directly. Data were analyzed using descriptive statistical analysis techniques. Based on the results of the analysis it can be concluded that the level of numeracy literacy skills of students has an average value of 30.34 fsn is in the low category.

Keywords: *Numeracy Literacy Skills*

Introduction

Education is something that everyone needs. Education helps everyone develop opportunities to improve their quality of life. One of the government's policies to help improve the quality of education in Indonesia is to assess student learning. The form of evaluation is the application of AKM (Minimum Competency Assessment) which measures basic numeracy and reading skills according to all students. Numeracy is the understanding and ability to apply numbers and symbols related to basic mathematics to solve problems from various contexts of daily life and see information in different formats (e.g. diagrams, tables, graphs, etc.) and then make judgments and draw conclusions (Ministry of Education and Culture, 2023).

Numeracy skills are one of the goals of developing students' literacy abilities. Numerical fluency is defined as the ability to analyze and understand a statement in an activity using symbols or language of everyday life, and

express the statement orally and in writing. This skill is indispensable in social and state life, where economic and political information cannot be avoided. So, one must understand and interpret the information presented in numerical or graphic form. This ability also refers to understanding mathematically represented information, such as graphs, charts, and tables (Nasrah & Muaifah, 2020).

Numeracy literacy skills can provide independence in solving problems, so this skill is considered a basic part that students must have. But based on the graph above, it is known that students' math and reading skills in general are relatively weak. Based on the 2018 PISA results released by the OECD, it can be seen that Indonesian students have an average score of 379 and an average score of 487 in the fields of numeracy and literacy, and Indonesia is ranked 74th out of 79 countries that took the test.

Numeracy literacy is the knowledge and skills necessary to use numbers and symbols related to basic mathematics to solve practical problems in everyday life, then analyze the information presented in various formats and interpret the results of the analysis to predict and make decisions. Numeracy literacy is defined as the ability to apply numerical concepts and computational skills in everyday life and the ability to interpret quantitative information in the environment. Numeracy literacy includes three aspects, namely counting, mathematical relationships, and arithmetic operations. Arithmetic is the ability to count objects orally and the ability to determine the number of objects (Nurcahyono, 2023).

Literacy and numeracy are inseparable parts. Both play an important role in determining the quality of a nation. Because literacy and numeracy are basic skills. However, when the word is used, literacy and numeracy itself are called literacy. But in reality, literacy and numeracy have different meanings. Literacy is more accurately defined as understanding texts and responding to them appropriately, while numeracy is defined as the ability to apply numerical concepts in everyday life. Both are important to acquire because they both create the conditions for living outside the classroom. Literacy and numeracy are the best security so as not to be left behind in the progress of a country because almost all levels of society need literacy and numeracy. In everyday life, being an entrepreneur, starting a business, health problems, even national life, all of that requires calculations and reading. For example, to understand information about economics and politics. Therefore, strengthening reading and numeracy skills is very important in this field (Darwanto, 2021).

Numeracy is defined as the ability to apply reading concepts and numeracy skills in everyday life, as well as the ability to interpret quantitative information contained in the student environment. Numerical literacy as knowledge of the ability to use various numbers and symbols related to solving practical problems and analyzing data presented in the form of various graphs,

tables, charts or graphs then using the results of their interpretation to make predictions and make decisions (Latifah, 2022).

Based on the description above, a research will be conducted entitled "Description of Numeration Literacy Ability of each Indicator in Science Learning for Class VIII Students at SMP IT Wahdah Islamiyah Makassar". This study aims to determine the level of numeracy literacy ability of grade VIII students at SMP IT Wahdah Islamiyah Makassar and to determine the numeracy literacy ability of grade VIII students at SMP IT Wahdah Islamiyah Makassar.

According to Sani (2021), students' numeracy literacy ability can be measured using the AKM test. The AKM indicators in determining the numeracy literacy ability of students are as follows:

Table 1. Numeracy Literacy AKM Indicator

No.	Component	Indicator
1	content	numbers,
		measuremet and geometry
		uncertainty data
2	Cognitive Level	Understanding
		Application
		Reasoning
3	Context	Personal
		Socio-Cultural
		Scientific

Method

This study uses descriptive research, which is research that describes the numeracy literacy ability of grade VIII students at SMP IT Wahdah Islamiyah Makassar in each indicator. The population in this study is all grade VIII students at SMP IT Wahdah Islamiyah Makassar for the 2023/2024 academic year totaling 89 students. The sampling technique was chosen using a saturated sampling technique, which is when all members of the population are used as samples (Tarjo, 2019: 57)

Measurement of numeracy literacy ability is by using an instrument in the form of a numeracy literacy test with a total of 14 multiple-choice questions which include 3 indicators of numeracy literacy aspects of content (socio-cultural, personal and scientific), cognitive level (knowledge, application and reasoning), and context (numbers, algebra, data and uncertainty, geometry and measurement).

The value of numeracy literacy ability is the result achieved by students in the form of scores which are then converted into grades. Scoring is generally based on the weight given to each question item. Numeracy literacy and critical thinking skills tests are multiple-choice which totals 14 questions each. Each question item has 4 answer choices. The correct answer is worth 1, the wrong answer or not filled/left blank is 0. The formula used in data processing to determine the percentage of students' numeracy literacy ability is as follows (Sulistyawati, et al. 2022):

$$P = \frac{F}{N} \times 100\%$$

Information:

P : Percentage of earned score

F : The sum of each respondent's scores

N: Maximum score

The categorization of numeracy literacy ability values and the categorization of each indicator can be seen in the table below:

Table 2. Numeration Literacy Value Category

Score Interval	Category
81% - 100%	Very High
61%-80%	High
41%-60%	Medium
21%-40%	Low
0%-20%	Very Low

(Kalsum &; Sulastri, 2021)

Results and Discussion

This research was carried out at SMP IT Wahdah Islamiyah Makassar which took place from March 19 to March 30, 2024. The implementation of the activity was carried out offline by distributing numeracy literacy ability test sheets to 89 students in stages. Based on the answers of the learners, information will then be obtained regarding the description of the students' numeracy literacy abilities. The achievement of students on numeracy literacy skills will be interpreted based on the grades obtained. Furthermore, the values will be grouped with very high, high, medium, low and very low levels.

The numeracy literacy ability test includes 3 aspects, namely context aspects (personal, socio-cultural and scientific), cognitive level aspects (understanding, application and reasoning), and content aspects (numbers, algebra, geometry and measurement, as well as data and uncertainty). The following is an explanation of each question.

Question 1
Context : Personal
Cognitive : Reasoning
Content : Numbers
In an individual race, at the 6th second who is in the leading position...
A. Jodi.
B. Rio.
C. Diki.
D. Jodi dan Rio.

Question number 1 has an article that explains the activities of a group so that it is included in the personal context aspect. This question also includes cognitive reasoning aspects because it requires students to analyze and conclude based on the article that has been presented. Apart from that, this question is an example of numeracy literacy with the number content aspect because this question requires students' ability to have an understanding of number counting operations. The percentage of students who answered correctly on this question was 25.84.

Question 2
Context : Personal
Cognitive: Applying
Content : Data and uncertainty
Looking at Jodi's data, the average value of the distance that occurs in the first 3 seconds is...
A. 12,5
B. 12
C. 15
D. 32,5

Not much different from question number 1, this question is also in the

personal context aspect. This question includes a cognitive aspect with an applying indicator because it requires students to apply the knowledge they have to solve a problem. In solving this problem, students need to have an understanding of interpreting the data in the table. The percentage of students who answered correctly on this question was 42.7%.

Question 3
Context : Personal
Cognitive: Applying
Content: Numbers
Currently, Mayer is at point A with x energy. If Mayer then takes the A-B-C-A-D-E route, and what remains is 7 energies, Mayer's initial total energy is... energy.
A. 32
B. 25
C. 18
D. 7

Question number 3 is in the personal aspect because students position themselves as Mayer, a person who is thinking about his personal problems (in this case spending energy) with mathematical concepts. Students also need to have the cognitive aspect of applying because it requires students to apply knowledge related to concepts. In this question, the number content aspect is related to number counting operations. The percentage of students who answered correctly on this question was 29.2%.

Question 4
Context : Scientific
Cognitive: Knowing
Content : Data and Uncertainty
Based on the information above, which of the following statements is correct?
A. The protein content in 200 grams of kale is higher than the protein content in 200 grams of spinach.
B. The calories contained in 100 grams of green mustard greens are lower than in 100 grams of curly mustard greens.
C. 100 grams of yellow pumpkin has the same amount of protein as 100 grams of green mustard greens.
D. At the same amount, spinach has the highest amount of protein compared to the others

Question number 4 has a scientific context text which leads to the application of mathematics in the universe and issues and topics related to science and technology. This question is included in cognitive knowing because to answer the question, students simply take information from the graph that has been inserted. Apart from that, this question is a numeracy literacy question with aspects of data and uncertainty due to the simple presentation of data and data management. The percentage of students who answered correctly on this question was 49.44%.

Question 5
Context: Personal
Cognitive: Reasoning
Content: Numbers
If you are advised to consume 300 grams of varied vegetables a day with the condition that the total calorie content in a day must be less than 80 grams and the protein must be more than 5 grams, then the combination of

3 vegetables (100 grams each) that is in accordance with this recommendation is...

A. Kale, spinach, mustard greens.
B. Spinach, mustard greens, green peppers.
C. Chayote, yellow pumpkin, salad.
D. Broccoli, red peppers, radishes

Question number 5 has personal context text which leads to calculating the total calorie content that must be consumed. This question also includes cognitive reasoning aspects because it makes valid conclusions based on information and facts. Apart from that, this question is an example of a numerical literacy question with the number content aspect because it is related to comparing and ordering various types of numbers. The percentage of students who answered correctly on this question was 30.34%.

Question 6

Context : Personal
Cognitive: Applying
Content : Algebra
If Fani consumes vegetables a day consisting of 100 grams of spinach, 50 grams of white mustard greens, 25 grams of asparagus and 25 grams of radishes, then the calories consumed by Fani that come from vegetables are...

A. 70 grams.
B. 60 grams.
C. 50 grams.
D. 40 grams.

Question number 6 has personal context text which leads to calculating the number of calories feni consumes. This question is included in the cognitive aspect of applying because it creates and interprets various mathematical representations into an answer. Apart from that, this question is a numeracy literacy question with aspects of algebraic content because of the subdomains of equations and inequalities, relations and functions (including number patterns) so that it can solve the existing problems. The percentage of students who answered correctly on this question was 19.1%.

Question 7

Context : Social Culture
Cognitive: Reasoning
Content: Numbers
Based on the text, which of the following statements is true?

A. The distance from Adi's house to Budi's house is 150 meters
B. The distance from Budi's house to Cyndi's house is 200 meters
C. The distance from Cyndi's house to Demas' house is 350 meters
D. The distance from Adi's house to Demas' house is 750 meters

Question number 7 has a socio-cultural context text because the text addresses community or societal problems and socio-cultural problems. This question also includes the cognitive reasoning aspect because this cognitive level assesses students' reasoning abilities in analyzing data and information. Apart from that, this question is an example of a question from the numeracy literacy aspect of number content because it is related to comparing and ordering various types of numbers. The percentage of students who answered correctly on this question was 49.44%.

Question 8

Context : Personal
Cognitive : Knowing
Content : Data and Uncertainty
Based on the data in the text above, which of the following statements is correct?

A. The average value of water consumed by Ali in the first four months was 75.
B. The median value of tea consumed by Ali in a year is 50.
C. The mode value of the milk that Ali consumes a year is 50
D. The range of breast milk consumed by Ali in a year is 45.

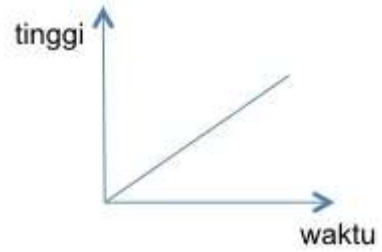
Question number 8 has text that leads to calculating the amount of drinking water he consumes and is presented in graphical form. So, it is included in the personal context aspect because it recognizes the role of mathematics in their personal lives. This question also includes the cognitive aspect of knowing because to answer the question, students only need to take information from the graph that has been inserted. Apart from that, this question is an example of numeracy literacy with content aspects with data indicators and uncertainty due to the simple presentation of data and data management. The percentage of students who answered correctly on this question was 22.47%.

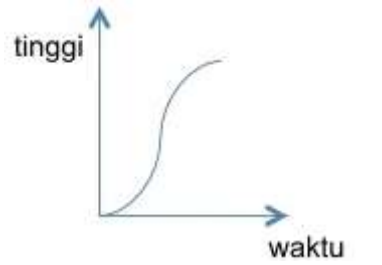
Question 9
Context :Personal
Cognitive : Knowing
Content : Data and Uncertainty
To maintain his health, Mr. Ali will reduce his consumption of tea water by 5 liters every month. Choose the False statement!

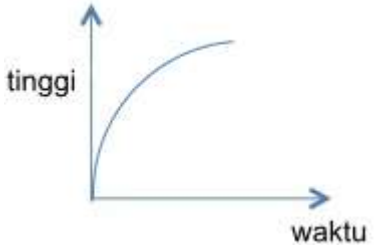
A. The average amount of tea consumed by Mr. Ali the following year decreased by 5 liters.
B. The median amount of tea consumed by Mr. Ali the following year decreased by 5 liters.
C. The amount of tea consumed by Mr. Ali the following year was reduced by 5 liters.
D. The range of tea consumed by Mr Ali the following year was reduced by 5 liters.

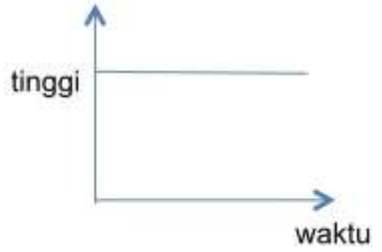
Question number 9 is in the context aspect with personal indicators, the cognitive aspect with knowing indicators and the content aspect with data and uncertainty indicators. This question can determine the amount of water consumed in their personal life which can help students to recognize the role of mathematics in their personal life. In solving this problem, students need to have knowledge and understanding in interpreting existing data. The percentage of students who answered correctly on this question was 29.21%.

Question 10
Context : Socio-Cultural
Cognitive: Applying
Content : Numbers
When the pool is filled with water with a constant water flow, which (height-time) graph shows the process of changing the water level in the pool?

A.


B.


C.


D.


This question is in the context aspect with socio-cultural indicators, the cognitive aspect with applying indicators and in the content aspect with number indicators. In this question, students can recognize the role of mathematics in everyday life. In solving this problem, students need to have knowledge and understanding in interpreting existing data. The percentage of students who answered correctly on this question was 30.34%.

Question 11

Context : Socio-Cultural

Cognitive: Applying

Content : Geometry and measurement

Based on the text, which of the following statements is FALSE?

A. The maximum temperature of the gourami fish's natural habitat is 301 K.
B. The volume of the gourami fish pond is 70 m^3.
C. The fish pond drying process takes a minimum of 500 hours.
D. A total of 2 kg of agricultural lime is sprinkled on the bottom of the pond every 10 m^2.

This question is in the context aspect with social and cultural indicators, the cognitive aspect with applying indicators and the content aspect with geometric and measurement indicators. In this question, students can recognize the role of mathematics in everyday life. In solving this problem, students need to have knowledge and understanding in calculating existing data. The percentage of students who answered correctly on this question was 20.22%.

Question 12

Context : Socio-Cultural

Cognitive : Applying

Content : Geometry and measurement

Based on the text above, if a racer is able to complete an F1 race in 1 hour 45 minutes. If he travels at an average speed of 200 km/hour, the length of the path he traverses is... km

A. 3,5
B. 35
C. 350
D. 3500

This question is in the context aspect with socio-cultural indicators. In the cognitive aspect of this question, it

is an applying indicator because students need to apply the concept of speed to answer the question. In the content aspect with geometric indicators and measurements, students need to have knowledge and understanding in calculating the speed of racers. The percentage of students who answered correctly on this question was 33.71%.

Question 13
Context : Scientific
Cognitive : Applying
Content : Algebra
Based on the text, if someone drops an object simultaneously from a height of 500 m from Nevado and the Arctic Ocean, determine the difference in time between the object in both places until it reaches the Earth's surface...
A. 0,08 s
B. 0,8 s
C. 8 s
D. 80 s

This question is in the context aspect with scientific indicators. In this question, students need to apply the knowledge they have related to GLBB in solving this problem so that this question includes cognitive aspects with applyig indicators and content aspects with algebraic indicators. The percentage of students who answered correctly on this question was 22.47%.

Question 14
Context : Scientific
Cognitive : Applying
Content : Geometry and measurement
Based on the text, if an object is thrown vertically upwards with an initial speed of 20 m/s, what happens is...
A. The highest point reached is 10 m.
B. The highest point reached is 20 m.
C. Time to reach peak point 20 s.
D. Time to reach peak point 10 s.

Question number 14 has the same aspect. In the context aspect, scientific indicators are able to determine the correct statement based on a scientific article. The cognitive aspect of applying requires students to choose a method and also apply the concepts that must be used to solve the problem. Furthermore, the geometry and measurement content aspects require students to calculate speed. The percentage of students who answered correctly in question number 14 was 25.84%.

Based on the explanation above, it is known that students' ability to solve numeracy literacy questions is still in the low category. The percentage of students who answered correctly on each question number can be described in the picture above, so that information is obtained that the most students answered correctly on question number 4 with a percentage of 49.44% and the lowest percentage was question number 6 with a percentage of 19. .1%.

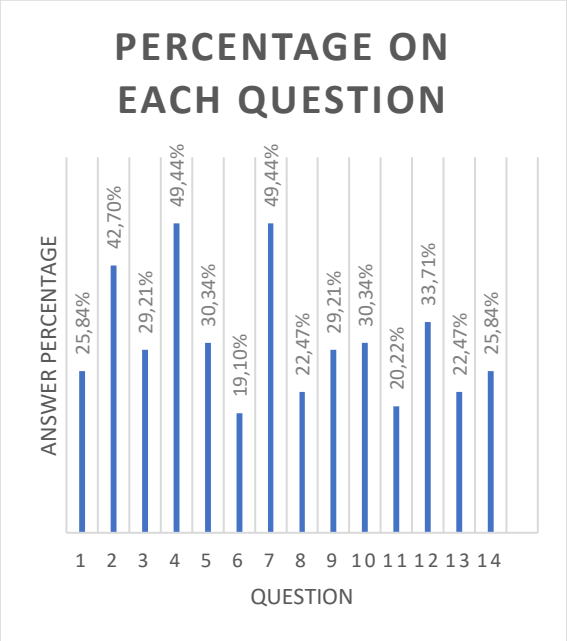


Figure 1. Percentage of Each Question on Scientific Literacy Ability

Conclusion

Based on the results of the analysis and discussion, it is known that the ability of grade VIII students at SMP IT Wahdah Islamiyah Makassar in solving numeracy literacy problems is still in the low category with an average score of 30.73%. So that learning evaluation is needed that can improve the numeracy literacy ability of students.

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