Analysis of the Numeracy Literacy Ability of Aik Anyer State MTs Students in the Independent Learning Curriculum Era

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ABSTRAK

Kemampuan literasi numerasi memegang peranan krusial dalam era *Merdeka Belajar* saat ini. Dengan penguasaan literasi numerasi yang baik, siswa mampu berpikir kritis serta menyelesaikan berbagai permasalahan yang mereka hadapi dalam kehidupan sehari-hari. Penelitian ini bertujuan untuk mengevaluasi tingkat literasi numerasi siswa di masa *Merdeka Belajar*. Subjek penelitian adalah siswa kelas MTs NW Aik Anyer yang berjumlah 20 orang dan telah menerapkan *Kurikulum Merdeka*. Pendekatan yang digunakan dalam penelitian ini adalah metode deskriptif kualitatif. Data dikumpulkan melalui tes uraian sebanyak lima soal yang menyajikan data, dengan indikator literasi numerasi meliputi: 1) Kemampuan menggunakan berbagai angka dan simbol yang berkaitan dengan operasi matematika dasar untuk menyelesaikan persoalan sehari-hari; 2) Kemampuan menganalisis data dalam berbagai format (grafik, tabel, bagan, diagram, dll.); dan 3) Kemampuan menafsirkan hasil analisis untuk membuat prediksi, merumuskan, serta mengambil keputusan. Data dianalisis dengan menghitung persentase rata-rata pada setiap indikator literasi numerasi. Berdasarkan hasil penelitian dan analisis data penelitian yang dilakukan oleh peneliti, kemampuan literasi numerasi siswa kelas MTs NW Aik Anyer yang telah menerapkan *Kurikulum Merdeka Belajar* berada pada tingkat rendah, yaitu sebesar 40%.
Keyword: Literasi Numerasi; Siswa MTs; Kurikulum Merdeka Belajar

ABSTRACT

Numeracy literacy skills play a crucial role in the current era of Independent Learning. With good mastery of numeracy literacy, students are able to think critically and solve various problems they face in everyday life. This study aims to evaluate the level of numeracy literacy of students during the Independent Learning era. The subjects were 20 students of MTs NW Aik Anyer, who have implemented the Independent Curriculum. The approach used in this study was a qualitative descriptive method. Data were collected through a five-question essay test that presented data, with numeracy literacy indicators including: 1) The ability to use various numbers and symbols related to basic mathematical operations to solve everyday problems; 2) The ability to analyze data in various formats (graphs, tables, charts, diagrams, etc.); and 3) The ability to interpret the results of the analysis to make predictions, formulate, and make decisions. Data were analyzed by calculating the average percentage for each numeracy literacy indicator. Based on the results of research and analysis of research data conducted by the researcher, the numeracy literacy skills of MTs NW Aik Anyer class students who have implemented the Independent Learning Curriculum are at a low level, namely 40%.
Keyword: Numeracy Literacy; MTs students; Independent Learning Curriculum

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1. INTRODUCTION

Education plays a crucial role in determining the quality of human resources (*HR*) today. Mathematics is a key element in driving the development of Science and Technology (*S&T*) and contributes to various scientific disciplines, including as a foundation for the development and application of computer networks

(Sudrajat, 2018). Therefore, efforts to improve the quality of human resources must be accompanied by the strengthening of and innovation in mathematics education. Along with the progress of the era, *S&T* has developed very rapidly, making the role of mathematics in everyday life increasingly crucial for enhancing efficiency and productivity (Sudrajat, 2018). Mathematics is also a compulsory subject taught at all levels of education, from the elementary level to higher education. The results of international studies such as the *Programme for International Student Assessment* (*PISA*) have consistently placed Indonesia in the lower ranks for reading, mathematics, and science abilities (Ghozy et al., 2025).

The Ministry of Education, Culture, Research, and Technology (*Kemendikbud*) has initiated reforms in the national education system through the implementation of the *Merdeka Curriculum* (Efyanto, 2021). This curriculum was designed as a solution to restore the learning process during the transition from the pandemic to a new normal. Over time, the *Merdeka Curriculum* has evolved into a more flexible learning framework, with an emphasis on mastering essential materials, character building, and developing student skills to recover from the learning loss caused by the pandemic. One of the main features of the *Merdeka Curriculum*, as described by *Kemendikbud* (2022), is the importance of deepening basic competencies such as literacy and numeracy. At the 2015 *World Economic Forum* (Ate & Lede, 2022), six basic literacies were agreed upon: 1) Reading and writing literacy; 2) Numeracy literacy; 3) Science literacy; 4) Cultural and citizenship literacy; 5) Financial literacy; and 6) Digital literacy. Of these six, numeracy literacy has a strong connection to logical and reasoning abilities, especially within the context of mathematics education, and is highly relevant to the *Merdeka Curriculum* approach.

Numeracy literacy refers to the knowledge and skills to use numbers and basic mathematical symbols to solve real-life problems and to understand information presented in various formats—such as graphs, tables, diagrams, or charts—in order to make accurate predictions and decisions (*GLN*, 2017). This ability plays a significant role in mathematics education, as mathematics demands students' reasoning and critical thinking skills to solve various problems (Salvia et al., 2022). In the context of *Merdeka Belajar*, strengthening numeracy literacy is crucial for students. Individuals with strong numeracy literacy tend to be capable of thinking critically and solving problems effectively (Novitasari, 2022).

Numeracy literacy, as part of the mathematics discipline, is an essential skill that students need to possess. Unlike theoretical mathematics instruction, numeracy literacy places greater emphasis on the application of mathematical concepts in real-life contexts, such as managing personal finances or interpreting data in visual forms like graphs and tables (Zahwa et al., 2022). Ekowati et al. (2019) also highlight that numeracy literacy is an integral part of mathematics, as its components are inseparable from the fundamental concepts of mathematics itself. Referring to the *GLN* (2017), numeracy literacy indicators include: 1) The ability to use numbers and basic mathematical symbols to solve everyday problems; 2) Proficiency in analyzing data presented in various visual forms such as diagrams, tables, graphs, and charts; and 3) The ability to interpret the results of the analysis to make predictions, formulate conclusions, and make decisions.

However, the reality in the educational landscape indicates that mathematics instruction in schools has not yet provided sufficient opportunities for students to hone their numeracy literacy skills. Rezky et al. (2022) found that junior high school students with low numeracy literacy levels tend to face difficulties in understanding geometry problems, are unable to determine appropriate problem-solving and calculation strategies, and struggle to connect mathematical symbols and draw accurate conclusions. Numeracy literacy plays a crucial role as it helps students understand concepts and solve problems effectively. This is supported by the findings of Sari & Aini (2022), which showed that junior high school students have not yet mastered aspects of numeracy literacy, particularly when working on problems related to number patterns, using numbers and symbols, and interpreting data to make predictions and sound decisions.

In the learning process, students not only receive subject matter but also apply mathematical knowledge in their daily lives, such as when calculating their needs while purchasing food or other goods. The *Merdeka Belajar* concept emphasizes the importance of independent, creative, and innovative learning, requiring students to be able to solve the problems they face, especially in the context of mathematics (Naufal, 2021). With the implementation of the *Merdeka Curriculum*, it is hoped that students can develop problem-solving abilities based on personal experience, gain greater control over their learning process, and enhance their skills in independence, creativity, innovation, and responsibility (Nugraha, 2022). In facing the *Merdeka Belajar* era, students must be able to adapt, while the teacher's role shifts to that of a facilitator, tasked with supporting discussions, fostering learning independence, and assisting students in identifying the problems they encounter (Istikhoirini, 2021).

Based on the aforementioned background, numeracy literacy plays a vital role in the mathematics learning process in the *Merdeka Belajar* era. One relevant topic for measuring students' numeracy literacy skills in this era is data presentation, as it is directly related to real-life situations. However, in learning this topic, students still face challenges, such as difficulty in representing data accurately (Koparan, 2015). Research conducted by Ate & Lede (2022) shows that the numeracy literacy skills of junior high school

students, particularly in solving problems related to plane figures and data presentation, are still considered low—especially in the use of numbers and symbols to solve everyday problems. Therefore, to provide a new contribution to this field, this research aims to analyze the extent of students' numeracy literacy skills in solving problems focused on data presentation, particularly among junior high school students who have followed the *Merdeka Curriculum*.

2. RESEARCH METHOD

This study employs a qualitative approach with a descriptive method. In this research, an analysis of student responses was conducted to measure numeracy literacy skills, providing descriptions of the mathematical concepts used. Subjects were selected using a purposive sampling technique, which is a method of intentionally choosing a sample to adequately represent the population (Lestari & Yudhanegara, 2018). The subjects in this study were 20 students from MTs NW Aik Anyer who had participated in learning under the *Merdeka Curriculum*.

The research instrument was adapted from Fitriana (2022), consisting of a validated essay test with five questions on the topic of data presentation. The indicators used to assess students' numeracy literacy skills include: 1) The ability to use various types of numbers and symbols related to basic mathematical operations to solve everyday problems; 2) The ability to analyze data presented in visual formats such as graphs, tables, diagrams, or charts; and 3) The ability to interpret the results of the analysis to make predictions, formulate conclusions, and make decisions.

The data analysis process was conducted in three stages: data reduction to simplify information, data display to facilitate analysis, and conclusion drawing to generate meaningful understanding (Sugiyono, 2015). To evaluate the students' answers, the researcher referred to the scoring guidelines from Asrul et al. (2014).

$$P = \frac{f}{N} \, x \, 100 \, \% \qquad (1)$$

The explanation of the formula is as follows: *P* represents the student's percentage score, *f* is the score obtained by the student, and *N* indicates the maximum or ideal score. To assess the students' numeracy literacy level, the obtained scores were then classified into specific categories according to the guidelines from Asrul et al. (2014) as follows.

Table 1. Description of Ability Levels

Score Range (%)	Category
80% ≤ p ≤ 100%	Very High
60% ≤ p < 80%	High
40% ≤ p < 60%	Moderate
20% ≤ p < 40%	Low
0% ≤ p < 20%	Very Low

3. RESULTS AND DISCUSSION

A. Research Results

Based on the research conducted by the researcher at MTs NW Aik Anyar, involving 20 eighth-grade students as research subjects, data on students' numeracy literacy skills were obtained by administering a test consisting of five essay questions. Each question corresponds to a numeracy literacy indicator, namely: 1) The ability to use various types of numbers and symbols related to basic mathematical operations to solve everyday problems; 2) The ability to analyze information presented in various formats (graphs, tables, charts, diagrams, etc.); and 3) The ability to interpret the results of an analysis to make predictions, formulate conclusions, and make decisions. From the research conducted, the data obtained are as follows:

Table 2. Summary of Student Data

Metric	Metric
Number of Students	20
Average	49,65
Standard Deviation |	27,97
Maximum Score	97
Minimum Score	6

From the results of the numeracy literacy skills test of 20 students, the average score obtained was 49.65% with a standard deviation (level of data dispersion) of 27.97%, as shown in Table 2 above. The maximum numeracy literacy score achieved by the eighth-grade students of MTs NW Aik Anyer was 97, and the minimum score was 6. The percentage distribution of students' numeracy literacy skills can be seen in the following table.

Table 3. Percentage Distribution of Numeracy Literacy Test Results

Score Range (%)	Number of Students	Category
$80\% \leq p \leq 100\%$	3	Very High
$60\% \leq p \leq 80\%$	3	High
$40\% \leq p \leq 60\%$	5	Moderate
$20\% \leq p \leq 40\%$	4	Low
$0\% \leq p \leq 20\%$	5	Very Low

Based on the table above, it can be seen that 3 students achieved a "Very High" score, 3 students received a "High" score, 5 students were in the "Moderate" category, 4 students were in the "Low" category, and 5 students were in the "Very Low" category. Meanwhile, the average achievement based on the numeracy literacy indicators is as follows.

Table 4. Percentage of Test Results by Numeracy Literacy Indicator

Indicator	Percentage	Interpretation
The ability to use various types of numbers and symbols related to basic mathematical operations to solve everyday problems	35%	Low
The ability to analyze information presented in various formats (graphs, tables, charts, diagrams, etc.)	40%	Low
The ability to interpret the results of an analysis to make predictions, formulate conclusions, and make decisions	44%	Moderate
Average	**40%**	Low

From Table 4 above, it is evident that the first indicator obtained a percentage of 35%, the second indicator achieved 40%, and the third indicator reached 44%. From this data, the average percentage across the three indicators is 40%, which falls into the "Low" category.

B. Discussion

Based on the research findings, students' numeracy literacy skills in the *Merdeka Belajar* era are classified into five levels. This classification refers to the opinion of Asrul et al. (2014), who divide numeracy literacy levels into: very high, high, moderate, low, and very low. Subsequently, the analysis of students' answers in solving numeracy literacy problems was conducted based on these categories.

Based on field research, the analysis of students in the "Very High" category included 3 out of 20 students. One student's answer, despite being in a high category, did not demonstrate achievement in the indicator of interpreting analysis results to make predictions, formulate conclusions, and make decisions. This was evident from an incorrect answer where the student only calculated the fish catch for a single day, whereas question number 3 required them to determine the number of days needed to earn an income of Rp7,700,000. This finding aligns with the statement by Yustinaningrum (2021), who noted that students still face difficulties in problem-solving, from identifying the problem and translating it into a mathematical model to developing reasoning and devising a solution strategy. Therefore, although classified in the "Very High" category, these students have not fully mastered the numeracy literacy aspect of interpreting analysis for prediction, conclusion formulation, and decision-making.

Based on the analysis of the "High" category, which included 3 out of 20 students, the average errors in answering questions were found in problems 2 and 3, similar to the mistakes made by the "Very High" category students. This indicates that students have not yet met the indicator requiring the ability to use various numbers and symbols related to basic mathematical operations to solve real-world problems. It was observed that students made errors in their answers; on the answer sheet, a student only provided the final result for five days without showing the necessary mathematical operation process, and the answer given was also inaccurate. This finding is consistent with the statement by Sidik & Wakih (2020), who mentioned that students still face obstacles in understanding information from questions and have difficulty translating problems into appropriate mathematical models. Thus, it can be concluded that although they are in the "High" category, these students have not fully mastered the numeracy literacy aspect related to using basic numbers and symbols to solve everyday problems.

Based on the analysis of the "Moderate" category, which included 5 out of 20 students, one type of error was observed in the solution to question number 5. This error shows that students have not yet achieved the indicator for interpreting analysis results to make predictions, formulate conclusions, and make decisions. From the answer, it was clear that the student performed an incorrect calculation by adding the harvest yields of 2018 and 2019, whereas the question asked for a comparison of the increase in harvest from 2018 relative to the previous year. Consequently, the answer provided was inaccurate. This finding aligns with the opinion of Sari & Aini (2022), who stated that students often make calculation errors, leading to incorrect final results. Therefore, even in the "Moderate" category, these students have not fully mastered the numeracy literacy indicator related to interpreting analysis for prediction, conclusion formulation, and decision-making.

Based on the analysis of the "Low" category, which included 4 out of 20 students, the average errors were found in questions 1 and 4, in addition to questions 2 and 3, which showed similar mistakes to those in

the higher categories. One mistake made by students in the "Low" category was seen in solving questions 1 and 4. This indicates that students have not met the indicator for analyzing information presented in various visual formats, such as graphs, tables, charts, or diagrams. For question 1, a student created a bar chart that only showed a visual form without considering important information from the problem's narrative, such as the daily fish catch and the price per kilogram. Meanwhile, for question 4, the table created only included data from the first harvest, omitting data from the second and third harvests, as well as the total annual harvest, as requested. This is consistent with the findings of Koparan (2015), who stated that students often struggle with presenting and understanding information from displayed data, leaving them unable to read and interpret the content of tables correctly. Thus, it can be concluded that students in the "Low" category have not fully mastered the numeracy literacy skill of analyzing information through various forms of visual data presentation.

In this study, the average achievement score for each indicator is reinforced by findings from student responses, which indicate that junior high school students in the *Merdeka Belajar* era face difficulties in developing numeracy literacy skills. The analysis showed that a portion of students experienced obstacles in each indicator. This is due to the students' inability to understand and interpret the information contained in the questions. This finding is consistent with the research by Sudirman et al. (2018), which revealed that students struggle with word problems due to a lack of thoroughness and care in reading and understanding the meaning of the sentences, including difficulties in identifying known information, the question being asked, and the required solution steps. Furthermore, students also face constraints in selecting appropriate problem-solving strategies, which shows they are unable to understand and apply relevant concepts or principles to the problem. According to Juanti et al. (2021), this obstacle arises because students cannot determine the correct formula to solve the given problems. Some students were also unable to answer correctly when asked to analyze information in a table or convert a word problem into a graph or table. Therefore, one strategy to improve students' numeracy literacy is to implement learning innovations that can foster an increase in students' emotional intelligence (Putri et al., 2021).

The findings of this research are consistent with the results of a study by Fauzi et al. (2021), which stated that low numeracy literacy is partly caused by weak reading skills. This occurs because students do not fully understand or analyze the information provided in the questions. On the other hand, the implementation of *Merdeka Belajar* in the field has not been optimal. Some of the obstacles encountered include students' difficulty in understanding mathematical material and the fact that the *Merdeka Curriculum* is still relatively new in practice (Oktavia et al., 2022). To address this, in order to improve students' numeracy literacy in the *Merdeka Belajar* era, teachers are expected to be able to carefully select, design, and develop effective learning strategies, as well as provide opportunities for students to practice critical thinking (Irawan et al., 2017).

4. CONCLUSION

Based on the research results and discussion concerning the numeracy literacy skills of eighth-grade students at MTs NW Aik Anyer on the topic of data presentation in the *Merdeka Belajar* era, it is known that achievement across all numeracy literacy indicators is not yet optimal. This indicates that, in general, the students' numeracy literacy level is still considered low. Of the 20 students who were subjects of the study, the results showed that for the first indicator—the ability to use various types of numbers and symbols related to basic mathematical operations to solve everyday problems—the percentage was in the "Low" category. Similarly, the second indicator—the ability to analyze information in visual formats such as graphs, tables, charts, and diagrams—also showed low achievement. Meanwhile, for the third indicator—the ability to interpret the results of an analysis to make predictions, formulate conclusions, and make decisions—the results also fell into the "Low" category.

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