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Analysis of Literacy and Numeracy Skills of Senior High School Students at Pandeglang

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Abstract

According to PISA data, Indonesian students' literacy and numeracy skills rank 73rd and 74th out of 79 countries, respectively. This indicates a low level of literacy and numeracy among students in Indonesia. Therefore, innovative approaches in education are needed to enhance these skills. One such approach is fostering a school culture of literacy and numeracy, as implemented at one of the senior high schools in Pandeglang. This study aims to analyze the literacy and numeracy skills of Pandeglang 10th High School students. The research employs an ex post facto method with a descriptive approach. Data collection was conducted through literacy and numeracy tests administered to 10th-grade students. The analysis reveals that students' literacy skills are relatively good, while their numeracy skills tend to be low. Nevertheless, there has been a significant improvement in both aspects, with steady monthly progress in literacy and numeracy skills. Thus, sustaining literacy and numeracy activities as a school culture is crucial to achieving better outcomes.

Keywords: Literacy, Numeracy, High School Students

INTRODUCTION

Education is a structured effort to create an environment and instructional process. Education can influence community life and contribute to various social aspects, such as better health, higher civic and social engagement levels, and addressing issues like crime, antisocial behavior, and poverty (Grotlüschen et al., 2020). Through education, individuals can develop a sense of identity, uphold religious, cultural, and national values, and lead a moral life (Simamora et al., 2023).

Numeracy skills or mathematical knowledge are concepts of initial perception, processing, and reasoning about numbers and are widely studied concepts referred to as numerical abilities (Seitz et al., 2022). According to Amir and Zubaidah (2014), mathematics is dubbed the Queen of Sciences. Learning mathematics aims to hone reasoning and logical thinking skills. By mastering mathematics, students can improve their problem-solving abilities and convey ideas through speech, diagrams, notes, and other means, which eventually help them in the process of drawing conclusions (Syadran et al., 2023). However, mathematics is often perceived as daunting because students find it difficult to understand the material taught. This is due to the delivery method of mathematics lessons, which still relies on traditional approaches that tend to be rigid and monotonous, making it challenging for students to grasp

the material. Therefore, new innovations in teaching methods are needed to help students better understand mathematics.

In addition to the importance of understanding mathematics in social life, students' literacy skills also need to be developed to articulate the information they obtain. Literacy is a form of cultural practice and can be conceptualized as a set of skills required in specific contexts to achieve particular goals (Cheung et al., 2021). According to Purpura (2011), literacy and numeracy skills are closely related because both are essential competencies used in various life contexts. Moreover, these two competencies can assist students in solving problems related to numbers and analyzing problems to find solutions (Son et al., 2023).

Based on the 2018 PISA data released by OECD in 2019, Indonesia's average mathematics score was 379, while the literacy score averaged 371, ranking 73rd in numeracy and 74th in literacy out of 79 countries. This indicates that Indonesian students' literacy and numeracy skills are still very low. Several factors contribute to this, such as a lack of practice with literacy and numeracy-related problems and insufficient problem-solving skills in both mathematics and literacy among students. In classroom learning, many teachers still struggle to design literacy and numeracy questions, often creating routine, closed-ended questions solved with formulas. These practices train students only in basic mathematical concepts, while their reasoning skills remain underdeveloped (Salvia et al., 2022).

Given these issues, breakthroughs in education are needed to improve students' literacy and numeracy skills. One initiative introduced by the Ministry of Education and Culture (Kemendikbud) is the establishment of competency assessments to be implemented in all schools. These assessments aim to measure the minimum competencies possessed by students, helping them better understand mathematics and develop literacy skills, which are integral to the Minimum Competency Assessment (AKM) (Sani, 2021). In addition to efforts by Kemendikbud, schools are also encouraged to facilitate activities and provide resources to improve students' literacy and numeracy skills so that these abilities can be well-honed and continuously enhanced.

One of the senior high schools in Pandeglang has implemented activities to support enhancing students' literacy and numeracy skills by embedding these activities into the school's culture. Literacy activities are conducted every Wednesday before lessons begin. During these sessions, students are guided to read pre-prepared materials and then complete tasks designed to develop their literacy skills. Meanwhile, numeracy activities take place every Thursday. During numeracy sessions, students work on questions presented in engaging formats, such as using Wordwall. This approach aims to pique students' interest in solving problems, preventing

boredom with traditional math exercises. The questions are designed to enhance students' literacy and numeracy skills. With the literacy and numeracy culture established at Pandeglang 10th High School, it is hoped that students can overcome their fear of these subjects, which often hinder their understanding.

Based on these considerations, researchers will analyze the literacy and numeracy skills of students at Pandeglang 10th High School to serve as a reference for improving the implementation of literacy and numeracy culture in the school. This is expected to motivate other schools to adopt literacy and numeracy as part of their school culture.

METHOD

This research employed the ex post facto analysis method with a descriptive approach. It is referred to as ex post facto research because the researcher deals with already occurring variables and does not need to apply any treatment to the variables studied. Ex post facto research is a type of study that collects or explores data from events that have already happened (Wahyudin, 2015).

This research aims to analyze the literacy and numeracy skills of students at one of the senior high schools in Pandeglang conducted during July, August, and September, with the research subjects being 10th-grade students at the school. Data collection was carried out through literacy and numeracy tests that had already been conducted and validated by the school. The researcher only acts as a user of the existing instruments and is not involved in the process of creating or validating the instruments. In addition, interviews were conducted with teachers to obtain supplementary information.

RESULT AND DISCUSSION

Literacy is the ability to understand, use, and interpret written texts, while numeracy is the ability to access, use, and interpret mathematical information. Both skills are crucial for the well-being of individuals and communities. Therefore, mastering and fostering these skills from an early age is essential (Lechner et al., 2021). Based on the analysis of literacy skills among students at Pandeglang 10th High School, it was found that the literacy skills of 10th-grade students are fairly good, as evidenced by the scores obtained from literacy tests. The average literacy score in July was 55.59, which increased to 85.8 in August and 90.1 in September (See Figure 1). This improvement was achieved by consistently implementing literacy culture activities every Wednesday, allowing students to develop a habit of reading. This habit formation effectively shapes students' character and increases their interest in reading (Putri & Dwi, 2020; Pitaloka et al., 2021).

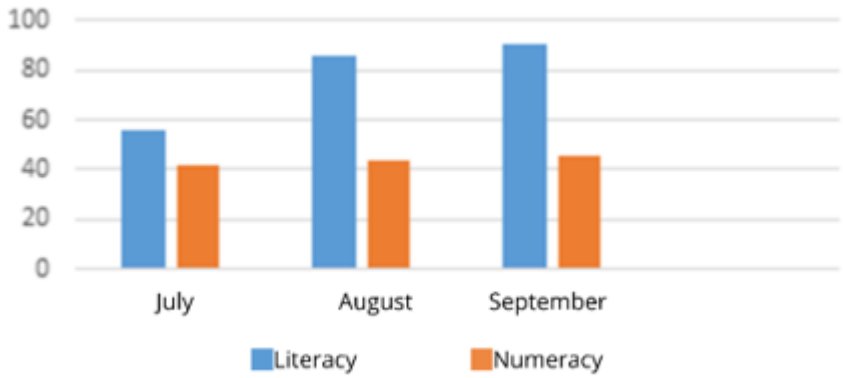

Figure 1. Result of students' literacy and numeracy

The literacy activities began with students reading assigned texts, followed by digital assessments via Google Forms and quizzes through Wordwall links to test their comprehension. These activities were varied weekly, such as students taking turns reading aloud and analyzing intrinsic elements in short stories, including themes, characters, settings, and messages. According to Nurcahyo (2014) and Syawaluddin & Nurhaedah (2017), reading aloud aligns with its purpose: comprehending texts, including story elements. The significant improvement in literacy skills indicates that consistent and varied literacy activities positively impact students. Learning media like Google Forms, Wordwall, and reflective videos has effectively increased students' reading interest and comprehension. Cordova et al. (2024) noted that digital platforms and online resources provide students with access to diverse texts, multimedia content, and interactive learning experiences, enriching their reading experience and broadening their understanding of complex topics. Napfiah et al. (2023) also recommend leveraging technology like YouTube to develop students' literacy skills. Ati and Widiyarto (2020) emphasize the importance of fostering interest in reading and writing through relevant activities and competitions that actively engage students.

The numeracy analysis results from July showed that the average basic math score for 10th-grade students was 42.1, based on tests covering numbers, algebra, data, and uncertainty. Only 60 students, about 15% of the total, scored at least 70, considered the minimum standard for adequate basic math skills. This data indicates that most students had not yet mastered basic math concepts. Therefore, strengthening basic math skills for all 10th-grade students during the first semester was deemed necessary, focusing on foundational concepts.

In August, a basic math reinforcement program was implemented, focusing primarily on multiplication tables from 1 to 10. Many 10th-grade students still struggled with basic multiplication, prompting deeper teaching methods, including peer tutoring. In this approach,

students proficient in multiplication were given opportunities to test their peers based on criteria set by the facilitators. Additionally, those who mastered multiplication were granted access to interactive games like Wordwall and multiplication puzzles through Liveworksheet, making the practice more engaging and varied. According to Nazillah and Fajar (2023), effective and enjoyable math learning requires creative and innovative teaching strategies to help students understand mathematical concepts better and faster.

In September, students began reinforcement on long division, supported by tutorial videos explaining the steps. After watching the videos, students engaged in small group discussions facilitated by classroom mentors and completed practice questions to test their understanding. The results revealed that most students still faced difficulties with long division, achieving an average score of 45.2. The primary challenge was the lack of mastery in basic multiplication, a crucial prerequisite for long division. According to Leby et al. (2023), many students struggle with division problems, which hampers their progress to more advanced stages. Learning difficulties are typically marked by obstacles in achieving goals, requiring more intensive efforts to overcome them (Mulyadi in Leby et al., 2020).

To improve numeracy skills among students, it is essential to design contextual and relevant math learning approaches connected to real-life scenarios. Mustofa (2024) argues that numeracy is not just about calculations but also understanding and solving real-world problems. Hence, math lessons should be structured to help students apply mathematical concepts in everyday life. Incorporating real-world contexts in math education allows students to see the relevance and benefits of numeracy, enhancing motivation and engagement. Strengthening basic math skills focused on foundational concepts like multiplication and division can help students progress in subsequent materials. Students can gradually develop basic math skills and achieve better results with consistent practice and in-depth learning. Research by Muniasari et al. (2024) highlights that factors influencing students' numeracy development include teaching quality, institutional support, and the sustainability of math education in schools.

According to Nabillah and Abadi (2019), several factors contribute to low numeracy skills among students, including difficulties in understanding materials and low learning motivation caused by poor study habits. Other factors include a lack of student engagement during lessons and inadequate teaching skills. Additionally, teachers' insufficient understanding of lesson planning and execution can lead to poor student performance in mathematics. Therefore, a basic math reinforcement program for 10th-grade students focusing on foundational concepts and engaging and need-based learning models is necessary. This approach can enhance students'

understanding of subsequent materials and make numeracy an integral part of their school culture (Bonifacci et al., 2022).

The literacy and numeracy culture activities at Pandeglang 10th High School are expected to help students gradually develop their basic math skills, increase motivation and engagement in learning, and achieve better outcomes through consistent and in-depth learning practices. According to Ikhsan (2019), the learning process determines students' learning outcomes.

CONCLUSION

Based on the analysis of literacy and numeracy skills of students at one of the senior high schools in Pandeglang, it can be concluded that the literacy skills of 10th-grade students are good, while their numeracy skills are still relatively low. However, numeracy skills have shown continuous improvement every month. Therefore, continuing the literacy and numeracy culture at one of the senior high schools in Pandeglang is still necessary to further enhance students' literacy and numeracy skills. Given the gradual improvement in student skills, the literacy and numeracy culture can also serve as a reference for other schools in their efforts to improve student's literacy and numeracy skills.

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