

Improving Primary School Students' Numeracy Skills through Innovative Creative Learning Media: A Case Study of the Kampus Mengajar Program at SDN 3 Sukamanah

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Abstract: This study aimed to evaluate the implementation of the creative numeracy work program within the seventh cohort of the Kampus Mengajar Program at SDN 3 Sukamanah. The research subjects consisted of 30 fifth-grade students selected through purposive sampling. The study employed a mixed-methods approach, beginning with a qualitative descriptive needs analysis and followed by the application of a pre-experimental One-Group Pretest-Posttest Design. Data were collected simultaneously using a digital class-based AKM test instrument and field notes. The findings indicated a significant improvement in students' numeracy competence, as reflected in a 16% increase in the proportion of correct answers, from 25% on the pretest to 41% on the posttest. The highest student score also showed a substantial rise, increasing from 45 to 75. In conclusion, the integration of creative instructional media and game-based learning strategies, such as "Multiplication Suit" and "Wall Clock," proved effective in stimulating students' interest and enhancing their understanding of basic mathematical concepts. The implications of this study affirm that pedagogical creativity constitutes a viable alternative solution for addressing limitations in facilities, infrastructure, and technological constraints, while also having the potential to transform students' mindsets and future educational aspirations.

Keywords: Classroom AKM, creative instructional media, game-based learning, Kampus Mengajar, numeracy.

Introduction

Strengthening numeracy skills at the primary education level is a fundamental pillar in developing a generation that is competent in the global era (Deda et al., 2023; Tanjung, 2024). Numeracy is not merely the mechanical ability to perform calculations, but rather the capacity to apply mathematical concepts to solve problems encountered in everyday life (Diez-Palomar et al., 2023; Hoogland, 2023). In response to national educational challenges, the Ministry of Education, Culture, Research, and Technology launched the seventh cohort of the Kampus Mengajar Program in 2024. This program was designed to provide university students with opportunities to make tangible contributions by assisting schools in accelerating improvements in literacy and numeracy, while also

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introducing innovations in instructional strategies in target schools. The presence of university students is expected to serve as a catalyst for pedagogical change, particularly in primary schools that face limitations in human resources and supporting facilities.

Nationally, literacy and numeracy challenges in Indonesia still require serious attention due to disparities in educational quality across regions (Ghozali et al., 2024; Saragih et al., 2025). Primary education plays a crucial role as a cognitive foundation; however, in practice, it is often hindered by administrative constraints and a lack of innovation in classroom instruction (Buabeng & Amo-Darko, 2025; Takyi et al., 2026; Yu, 2024). The Kampus Mengajar Program provides university students with the opportunity to conduct an in-depth needs analysis through interviews, direct observation, and documentation studies of the school's actual conditions (Kaasyifa et al., 2025). Based on the needs analysis conducted at SDN 3 Sukamanah, various complex challenges were identified, requiring creative interventions to ensure that the knowledge transfer process operates optimally and remains student-centered.

The infrastructure conditions at SDN 3 Sukamanah constitute one of the external factors affecting the effectiveness of numeracy instruction. Although the physical environment is considered adequate to accommodate students, the school faces a major challenge due to the absence of a library, which serves as the center of literacy development and an important source of learning references. In addition, classroom facilities and infrastructure were found to be in inadequate condition, with damaged desks and chairs as well as insufficient bookshelves. This limitation is further aggravated by the number of textbooks, which is not proportional to the number of students, so that one book often has to be shared alternately among several students. This limited physical access to quality learning materials directly reduces students' enthusiasm for exploring mathematical concepts that are often perceived as difficult.

From a pedagogical perspective, the instructional strategies implemented by teachers at SDN 3 Sukamanah still tend to be conventional. The use of the 2013 Curriculum across all grade levels, without variation in teaching methods, has resulted in classroom activities being largely centered on one-way lecturing. This condition has led to low levels of active student engagement in independently exploring the learning material. On the other hand, the use of technology as a learning medium also faces significant obstacles. Most senior teachers experience difficulties in operating digital technological devices, resulting in the very limited use of interactive instructional media in the classroom. The gap between the demands of educational digitalization and the reality of technical capacity in the field highlights the need for alternative learning media that are simple yet effective in delivering numeracy concepts.

The low level of numeracy skills in this school was confirmed by the rather concerning results of the initial assessment. Based on the implementation of the Classroom AKM pre-test for fifth-grade students, the data showed that the average percentage of correct answers in the numeracy component was only 25%. The highest score achieved by the students reached only 45, while the lowest score was at an extreme point, namely 5. Furthermore, one test item recorded a zero percent correct response rate, indicating a profound gap in students' understanding of mathematical concepts. These empirical findings provided a strong basis for the student team to design a work program focused on strengthening foundational numeracy through an approach that was more engaging and easier for students to understand.

In addition to academic and infrastructural factors, social challenges from the surrounding environment also shape the character and mindset of students at SDN 3 Sukamanah. The densely populated school environment, combined with the community's relatively nomadic lifestyle, contributes to the high frequency of student mobility in and out of the school, making it difficult to monitor competency development in a continuous manner. A relatively permissive social culture has also influenced negative student behaviors, such as the use of harsh language and a limited mindset in exploring their interests. These psychosocial conditions require an approach that addresses not only cognitive aspects but also affective dimensions through character education (*kelas pendekar*) in order to enhance students' learning motivation and self-confidence (Jiao, 2025; Priyadarshini et al., 2025).

To address these various challenges, a series of work programs based on creative media and educational games were designed. The Game-Based Learning approach was selected because it aligns with the cognitive development stage of primary school students, who tend to absorb material more

easily through the manipulation of concrete objects and interactive activities. Programs such as “Multiplication Suit” were intended to train students’ speed of thinking through light competition, while “Numeracy Snakes and Ladders” and “Jellyfish Hunt” incorporated visual elements and reward systems to enhance student engagement. The use of tangible media such as the “Wall Clock” also helped students connect abstract mathematical concepts with functional objects in their everyday lives. This media innovation was expected to break down the stigma that mathematics is a frightening subject.

Based on this background, this article examines the implementation of the creative numeracy work program during the Kampus Mengajar assignment at SDN 3 Sukamanah. The main focus of the discussion lies in the transformation of instructional strategies from conventional methods to interactive approaches, as well as in the analysis of their impact on students’ assessment outcomes. With post-test data showing an increase in the percentage of correct answers to 41%, this article seeks to demonstrate that well-targeted interventions through creative media can generate positive outcomes despite the school’s limited facilities and infrastructure. This success is expected to serve as a reference for educators to continue innovating in strengthening students’ numeracy competence at the primary school level.

Method

This study employed a mixed-methods approach, beginning with a qualitative descriptive needs analysis to map the actual conditions at SDN 3 Sukamanah. The initial stage was conducted through participatory observation, in-depth interviews with stakeholders, and documentation studies of Dapodik data as well as other school documents. To measure the impact of the numeracy intervention program, this study applied a pre-experimental One-Group Pretest-Posttest Design. This design involved a single group of subjects whose abilities were measured before (pre-test) and after (post-test) the treatment in order to determine the effectiveness of the intervention (Amarulloh & Irvani, 2025). The research subjects in this assessment evaluation were focused on 30 fifth-grade students selected through purposive sampling.

Data were collected simultaneously using both test and non-test instruments. Quantitative data were obtained through the administration of digital Classroom AKM tests (pre-test and post-test) using mobile devices. Meanwhile, qualitative data were gathered through field notes recorded during the implementation of creative numeracy activities such as “Multiplication Suit” and “Numeracy Snakes and Ladders.” Quantitative data were analyzed using a descriptive comparative method by comparing test scores, highest scores, lowest scores, and the percentage of correct answers between the pre-test and post-test sessions. The results of this analysis were then validated through triangulation techniques, including reflective discussions with the Field Supervisor Lecturer and mentor teachers, in order to draw comprehensive conclusions regarding the impact of the program.

Result and Discussion

Needs Analysis and Initial Numeracy Conditions

The initial stage of the assignment began with a school needs analysis conducted through direct observation and interviews to identify the learning challenges at SDN 3 Sukamanah. The observations revealed that the school did not have a library, which limited students’ access to independent learning resources. In addition, the instructional methods implemented by teachers remained conventional and lecture-based, as the Merdeka Curriculum had not yet been adopted and teachers still faced difficulties in utilizing technology. The condition of physical facilities, such as damaged desks and chairs, also affected students’ learning comfort.

Initial data on students’ numeracy ability were obtained through a Classroom AKM pre-test administered to fifth-grade students. The test results indicated low achievement, with the percentage of correct answers reaching only 25%. The highest score attained by the students was 45, while the lowest score was 5. These findings suggest the need for a transformation in instructional strategies from passive methods to active and interactive approaches in order to strengthen students’ mathematical foundations.

Implementation of the Creative Numeracy Work Program

As a concrete effort to respond to the low level of numeracy achievement, the student team designed a series of programs integrating creative media and educational games. This strategy began with a habituation-based approach through the “Multiplication Suit” program, which was implemented regularly before students entered the classroom starting on May 28, 2024. The program aimed to foster independence, speed, and students’ familiarity with solving basic multiplication problems through peer interaction. In addition to habituation activities, an approach employing concrete visual media was implemented through the creation of a creative “Wall Clock,” actively involving students in the process. Through this program, students not only learned to make instructional aids, but were also trained to understand the concept of time and how to read a clock visually, which proved effective in stimulating their creativity.

Further reinforcement of mathematical concepts was carried out through an interactive problem-solving approach and enjoyable game-based media. The “Jellyfish Hunt” program, implemented on May 27, 2024, challenged students to solve mathematics problems embedded in jellyfish visual characters, with the aim of developing critical thinking and problem-solving skills through a reward system for those who answered correctly. This approach was supported by the “Numeracy Puzzle” program, which strengthened basic mathematical concepts through interactive activities, as well as “Numeracy Snakes and Ladders,” which created a recreational yet educational learning atmosphere. Through this variety of activities, mathematical concepts that had previously been perceived as difficult became easier for students to accept and understand.

The culmination of the entire numeracy activity series was the implementation of the Literacy and Numeracy Festival (Feslitnum), held on May 2, 2024, to commemorate National Education Day. This festival served as both a platform for appreciation and a healthy competition for students through various contests, including reading, writing, and arithmetic competitions, as well as a “ranking 1” quiz challenge. In addition to showcasing academic abilities, Feslitnum also provided a venue for talent performances such as singing, dancing, art exhibitions, and engaging fun games. The presence of this festival proved effective in motivating students and fostering a high level of enthusiasm for the development of numeracy competence within the school environment.

Analysis of Post-Intervention Outcomes

The effectiveness of the numeracy program was evaluated by comparing the results of the Classroom AKM pre-test and post-test administered to the same group of subjects. A summary of the development of students’ numeracy performance based on the AKM assessment is presented in Table 1 below.

Table 1. Results of the Classroom AKM Test on the Numeracy Component

Achievement Indicator	Pre-test	Post-test	Improvement
Percentage of Correct Answers	25%	41%	16%
Highest Score	45	75	30 points
Lowest Score	5	15	10 points

Based on the data presented in Table 1, it was found that the use of engaging instructional media was able to produce a significant positive impact on students’ numeracy competence. In addition to the improvement in scores, a shift in students’ perspectives was also observed; the results of the aspirations assessment indicated that, after the program ended, students demonstrated a stronger future orientation and a clearer understanding of the level of education they wished to pursue.

The success of this program was supported by strong collaboration among the university students, mentor teachers, and the principal in providing facilities and technical input for the program. A psychosocial approach through character education also played an important role in mitigating the negative effects of the surrounding school environment, which tended to be permissive and harsh (Hanafiah et al., 2024; Jaleel & Kotian, 2024). The main challenges encountered were the school’s limited facilities and infrastructure, as well as the students’ initially closed mindset. However, through patient

interaction and student-centered instructional strategies, these challenges were successfully addressed, resulting in a tangible improvement in the quality of numeracy instruction at SDN 3 Sukamanah.

Conclusion

The implementation of the numeracy strengthening program at SDN 3 Sukamanah through the seventh cohort of the Kampus Mengajar Program was carried out successfully overall and generated a tangible positive impact on students. Based on the evaluation results from the Classroom AKM, a significant improvement was observed in the numeracy competence of fifth-grade students, as the percentage of correct answers increased by 16%, from 25% in the pre-test to 41% in the post-test. In addition, the highest numeracy score rose markedly from 45 to 75, while the lowest score improved from 5 to 15. These findings demonstrate that the integration of creative instructional media, such as "Multiplication Suit," "Wall Clock," and "Numeracy Snakes and Ladders," was effective in stimulating students' interest in learning and enhancing their understanding of basic mathematical concepts.

The findings of this study carry an important implication: limitations in facilities and infrastructure, such as the absence of a library and the inadequate condition of textbooks, do not necessarily constitute absolute barriers to achieving numeracy targets when supported by pedagogical creativity. The use of interactive and game-based learning media proved to be an effective alternative solution for overcoming students' boredom with conventional lecture-based methods, as well as the challenges associated with the limited use of technology among teaching staff. Beyond the cognitive dimension, a personal approach through character education classes was also shown to transform students' initially closed mindset into one that was more motivated to explore their potential and develop a clearer future orientation.

To ensure that the positive impact of this program can be sustained over the long term, it is recommended that the school continue and further refine the work programs that have been designed, even after the student teachers' assignment period has ended. Teachers are expected to continue innovating in the development of interactive and engaging instructional media that are responsive to the diverse characteristics of students. In addition, stronger collaboration and more intensive communication between the school and parents are needed to monitor students' learning progress and behavior consistently, particularly in light of the highly dynamic social environment surrounding the school.

Conflicts of Interest

The authors declare no conflict of interest.

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