

Utilizing Ice Cream Sticks as Simple Teaching Aids to Improve Elementary School Students' Ability to Count Objects Based on Geometric Shapes

Nurlailatun Ramdani¹, Nunung Fatimah², Fildzah Masturah³

¹Pendidikan Matematika, STKIP Harapan Bima, ²Pendidikan Guru Sekolah Dasar, STKIP Taman Siswa Bima, ³Guru SDN 16 Kota Bima

Email: nurlailatun2301@gmail.com

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Abstract

The ability to count objects based on geometric shapes is a fundamental aspect of early numeracy that should be developed from an early age. However, in lower primary classrooms, instruction is often delivered abstractly without the support of concrete media, making it difficult for students to grasp the concept. This community service activity aims to describe the implementation and impact of using ice cream sticks as simple instructional aids to improve the ability to count objects based on geometric shapes among first-grade elementary students. This study employed a qualitative descriptive method through observation, documentation, student work analysis, and informal interviews. The activity was conducted at SDN 16 Kota Bima, involving 20 first-grade students. The results show that using ice cream sticks helps students recognize geometric shapes, count concretely, engage actively, and strengthen mathematical representation and communication skills. These findings suggest that simple teaching aids can serve as effective, engaging, and contextual numeracy tools aligned with the principles of the Merdeka Curriculum.

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Corresponding Author:

Nurlailatun Ramdani

¹Pendidikan Matematika, STKIP Harapan Bima

Email: nurlailatun2301@gmail.com

1. INTRODUCTION

Basic numeracy skills involve not only arithmetic operations but also an understanding of shapes, patterns, and spatial relationships found in geometry. The ability to recognize and count objects based on geometric shapes is an important foundation in elementary school mathematics learning, particularly for first-grade students. This learning not only helps students understand the concepts of shape and number but also fosters logical thinking, visual observation, and object classification skills. Literacy and numeracy are fundamental skills that develop from an early age and are crucial for continuous development to hone children's skills and knowledge in interpreting numbers and letters in everyday life (Akpalia et al., 2024). Therefore, numeracy learning for early childhood must be designed to be relevant, contextual, and enjoyable.

The ideal conditions for relevant, contextual, and enjoyable numeracy learning are not yet fully reflected in practice in lower grades. Lower grade students often struggle to grasp the concept of two-dimensional shapes concretely, especially when the material is presented abstractly without the aid of learning media in the form of simple, engaging visual aids appropriate to the child's cognitive developmental stage. Research by Mohamed & Kandeel

(2023) states that teaching the properties of geometric shapes traditionally is ineffective because it doesn't help children visualize the shapes. Therefore, an approach that is tailored to children's characteristics and relies on playful, game-based learning is needed.

Yıldız (2024) emphasized that in elementary school, many children tend to think concretely, so learning media in the form of visual aids are needed that can bridge the abstraction of mathematical concepts through concrete visualizations. This is crucial for developing basic cognitive skills such as problem-solving, number processing, and the appropriate use of mathematical language. Real-world visualization through learning media in the form of simple visual aids not only plays a role in understanding number concepts but is also crucial in geometry learning, particularly in introducing basic shapes to early childhood students.

Geometry understanding in early childhood is influenced by the teacher's deep mastery of the material and their understanding of the students' informal experiences, such as from storybooks, games, or everyday activities. Before receiving formal instruction, many children form an initial understanding of shapes through their surroundings. Therefore, teachers need not only to master the content but also to understand how these informal experiences shape students' thinking. In fact, according to Nurnberger-Haag et al (2021), early childhood is capable of thinking more complexly than simply matching shapes visually, so learning approaches need not only be fun but also tailored to the child's thinking stage and cognitive needs.

Govender & Amevor (2025) emphasize that students' spatial thinking needs to be developed through activities that allow them to express ideas and visualize geometric concepts. One effective way is to use learning media in the form of simple props that students can explore directly. The use of such props not only brings students closer to mathematical concepts but also fosters active and meaningful learning experiences.

Various studies have shown that the use of concrete media can increase the effectiveness of mathematics learning in lower grades. One form of concrete media that is effective in lower grades is props. Props are tangible objects designed to help students visualize and understand abstract concepts. In this context, popsicle sticks are used as simple props to help students recognize and count geometric shapes in a concrete way. Research conducted by Fitriyani et al (2025) showed that using geometric puzzles made from colorful cardboard can help students recognize shapes and increase their interest in learning mathematics. Meanwhile, Hasanah & Agung (2018) used geometric blocks to help children recognize geometric shapes, which proved effective in improving children's geometry recognition skills.

Challenges in elementary mathematics learning are not only related to the availability of media, but also to the continued dominance of conventional methods. Ramdani & Fatimah (2023) revealed that students' critical thinking skills are still relatively low, exacerbated by the limited use of open-ended questions and teachers' lack of skills in encouraging higher-order thinking. Furthermore, the implementation of the Independent Curriculum in the field is still suboptimal, particularly in the use of relevant interactive media to encourage meaningful learning (Ramdani et al., 2024)

This situation requires teachers to be more creative in designing learning activities to make the learning process enjoyable and increase student motivation and achievement (Ramdani & Oya, 2024). Contextual and enjoyable media are essential, as explained by Ramdani & Suryaningsih, Sri Nurwalidainismawati (2024) who stated that creative and child-friendly learning approaches can encourage optimal numeracy skill development. Ramdani et al (2022) also showed that providing problem-solving exercises can significantly improve students' mastery

of mathematical concepts. Through the use of appropriate, contextual, and child-friendly media, teachers can create enjoyable and effective learning experiences that enhance students' motivation, numeracy skills, and optimal mastery of mathematical concepts.

Previous studies have shown that there are few community service activities that directly involve elementary school students, particularly first-grade students, in using simple teaching aids to teach counting objects based on geometric shapes. Therefore, the scientific novelty of this service lies in the use of popsicle sticks as a learning aid, a simple teaching aid that students can use directly to identify and count objects based on geometric shapes. This approach not only aims to enhance students' understanding of mathematical concepts in a visual and engaging way but also strengthens students' fine motor skills and creativity through active engagement in the learning process.

The problem formulation in this activity is: "How can the use of ice cream sticks as a simple teaching aid improve the ability to count objects based on geometric shapes in elementary school students?"

The purpose of this community service is to describe the implementation of community service activities for first-grade elementary school students through the use of ice cream sticks as a teaching aid for counting objects based on geometric shapes, as well as to evaluate its impact on improving the ability to count objects based on geometric shapes. Thus, through this community service, it is hoped that it will contribute in offering an alternative simple numeracy media that can be widely applied in elementary school environments, as well as being an innovative alternative in fulfilling numeracy media needs in lower grades.

2. METHOD

This study uses a descriptive qualitative approach with a focus on community service activities for first-grade elementary school students in mathematics learning, specifically related to the ability to count objects based on geometric shapes. This approach was chosen because it aims to understand the student learning process in depth through direct interaction in a real-life learning context. The activity was carried out in grade 1 of SDN 16 Kota Bima and was attended by 20 students. This activity is part of a community service program with an emphasis on active student involvement in the learning process based on learning media in the form of simple teaching aids. The researcher acted as both a facilitator and an observer during the entire series of activities

Learning activities are designed in several stages, which are visualized in the following image:

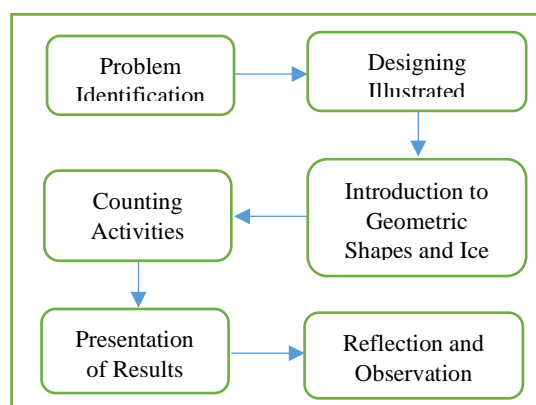


Figure 1. Stages of Learning Activities

From Figure 1 above, it can be concluded that the learning activities are carried out through six steps, namely:

1. The first stage begins with observing the difficulties first-grade students have in counting objects based on geometric shapes when the lesson is presented abstractly.
2. The teacher prepares counting problems containing pictures of geometric shapes (triangles, circles, rectangles, etc.) to stimulate counting activities.
3. Students are introduced to teaching aids in the form of popsicle sticks. The teacher explains how to use them to help identify and count the geometric shapes in the problem.
4. Students observe the pictures, use popsicle sticks to count the number of each shape, and write their answers in notebooks. This activity is carried out individually but still under teacher guidance.
5. Several students are selected to write their answers on the board and discuss them with their classmates. This discussion aims to strengthen understanding and increase student confidence.
6. The researcher observes student responses, levels of engagement, and conceptual understanding throughout the activity. Observation notes are used for reflection and analysis.

Data were collected using several techniques, including direct observation of the learning process, documentation in the form of photos of activities and field notes, analysis of student work, and informal interviews with students to obtain responses regarding the learning and teaching aids used. Data were analyzed descriptively and qualitatively through three main stages: data reduction, presentation, and drawing conclusions.

3. RESULTS AND DISCUSSION

The implementation of concrete media-based learning using popsicle sticks as teaching aids for first-grade elementary school students demonstrated significant improvements in their ability to count objects based on geometric shapes. Observations, documentation of student activities, and reflections during the implementation process demonstrated that this learning approach significantly assisted students in identifying and counting basic geometric shapes, such as triangles, circles, rectangles, and so on.

Students were seen to be able to visually recognize these shapes and demonstrated increased accuracy in counting the number of each shape. During the activity, students used popsicle sticks as counting aids. This activity demonstrated that concrete media is highly effective in facilitating understanding through direct visualization. This aligns with Piaget's theory of cognitive development, which states that early childhood is in the concrete operational stage, where learning becomes more meaningful when it involves real objects as intermediaries for abstract concepts (Santrock, 2017). Research by Riyadi & Supriatna (2025) also supports these findings, stating that traditional approaches to teaching geometry are less effective without the support of visualization and manipulatives. The following image shows students writing their calculations in their exercise books:

processes. This demonstrates that concrete media are not only visual aids but also bridges the development of mathematical communication skills. Representation theory in mathematics learning emphasizes the importance of students conveying ideas visually, symbolically, and verbally (Sabirin, 2014). Similarly, Kurniati et al (2021) state that spatial thinking processes are suitable for analysis in geometry material. This ability involves how students understand, imagine, and manipulate shapes in space. The following image shows a student explaining the process of calculating geometric shapes in front of the class:



Figure 4. Students explain the process of calculating geometric shapes in front of the class.

This activity aligns with the principles of the Independent Curriculum, which emphasizes the importance of contextual, enjoyable, and experiential learning. In this activity, the teacher acts as a facilitator, providing students with space for exploration, not merely as a transmitter of information. The use of popsicle sticks as simple teaching aids demonstrates that learning media need not be expensive to significantly impact student understanding. This finding is reinforced by Fidesrinur et al (2025) who stated that the lack of interactive media in mathematics learning in lower grades is one of the obstacles to low early numeracy skills. Therefore, this finding provides a practical solution through the use of simple tools appropriate to children's world.

This learning indirectly supports students' fine motor development, as they actively use their hands to hold, direct, and manipulate the popsicle sticks while counting. This activity fosters hand-eye coordination and strengthens motor control, which are essential foundations for early learning.

Overall, the findings obtained in this activity support the initial hypothesis that using popsicle sticks as teaching aids can improve students' understanding of geometric concepts and numeracy skills more effectively than conventional approaches. Thus, these results strengthen that the use of ice cream sticks as a simple teaching aid is an effective strategy in geometry-based numeracy learning in lower grades.

4. CONCLUSION

Data obtained through observation, documentation, analysis of student work, and informal interviews indicate that popsicle sticks as a learning medium contribute positively to numeracy learning in lower grades. The use of popsicle sticks not only helps students recognize and count basic geometric shapes visually and concretely, but also encourages active engagement, mathematical communication, and the strengthening of representational skills. These findings align with the characteristics of early childhood students' cognitive development, which requires a manipulative and multisensory approach to understanding abstract concepts. Furthermore,

contextual and enjoyable learning has been shown to increase students' motivation and confidence in learning mathematics.

Therefore, it can be concluded that popsicle sticks are an effective, practical, and appropriate learning strategy to support the strengthening of early numeracy in elementary school students within the context of the Independent Curriculum.

5. SUGGESTION

This community service demonstrates that the use of popsicle sticks is effective in helping first-grade elementary school students count geometric objects. For further development, it is recommended that this medium be varied with other, more complex geometric shapes and integrated into thematic activities. Teachers can also develop questions that encourage problem-solving and mathematical communication. However, limited learning time and students' low concentration levels pose challenges. Therefore, more flexible activity planning is needed, as well as training for teachers to maximize the use of simple media creatively and sustainably.

6. THANK YOU

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