The GASING Method as a Strategy for Enhancing Mathematics Learning in Primary Education: A Case Study at SDN 05 Sibawek

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Abstract: Mathematics learning in primary schools continues to face challenges, particularly low achievement resulting from limited instructional variation. This issue is evident among Grade III students at SDN 05 Sibawek, whose mathematics scores remain below the expected level. This study aims to examine the effectiveness of the GASING method (Easy, Fun, and Enjoyable) in improving students' mathematics learning outcomes. A One-Group Pretest–Posttest design was employed involving 16 students. The findings show an increase in the average score from 3.625 to 7 and a significant difference confirmed by the Wilcoxon test (r = 0.879). These results indicate that the GASING method supports students in understanding mathematical concepts more gradually and engagingly. The study provides empirical evidence that GASING is a promising instructional strategy for enhancing numeracy and learning motivation in primary school students.

Keyword: GASING Method; Elementary School; Mathematics

Introduction

Mathematics is widely recognized as a foundational discipline that underpins the development of higher-order cognitive abilities, including logical reasoning, analytical processing, problem-solving, and structured decision-making (Jannah & Hayati, 2024; Siagian, 2016). As a core component of early education, mathematics facilitates the formation of essential numeracy skills required in everyday life, encompassing basic measurement, financial literacy, quantitative interpretation, and the capacity to reason effectively in uncertain situations (Hong et al., 2020; Skagerlund et al., 2018). Accordingly, establishing a strong mathematical foundation during the elementary school years is critical, as deficiencies at this stage often propagate into persistent academic challenges in later schooling.

Despite its centrality, mathematics education at the primary level continues to face substantial pedagogical and cognitive barriers. A notable proportion of students struggle to transition from concrete experiences to abstract conceptualization. This shift is essential for mastering mathematical structures and symbolic representations (Arshad et al., 2017; Waswa & Al-Kassab, 2023). When students are unable to internalize underlying concepts, their comprehension becomes superficial, highly dependent on rote procedures, and prone to rapid decline once external support is removed. These learning obstacles commonly manifest as diminished motivation, heightened levels of mathematics anxiety, and a reluctance to engage actively in classroom discourse (Amanda et al., 2024; Anggraeni et al., 2020; Ningsih et al.,

2022). Such conditions indicate not only gaps in understanding but also broader issues related to cognitive load management, instructional design, and affective engagement.

In many elementary classrooms, teaching still relies heavily on oral explanations and tends to be monotonous, which limits student engagement and deeper understanding (Prameswara & X, 2023). This situation highlights the need for instructional strategies that are both effective and responsive to the learning characteristics of young students. One approach that has gained attention in primary mathematics education is the GASING Method (Easy, Fun, and Enjoyable). This method gradually builds understanding from concrete to abstract, reinforces learning through structured repetition, and uses intuitive patterns to make concepts more accessible. Research suggests that the GASING Method can improve conceptual clarity, strengthen working memory, support pattern recognition, and create a more enjoyable classroom atmosphere that fosters intrinsic motivation (Gou et al., 2024). These features make it a promising option for addressing the conceptual and motivational gaps often found in early mathematics learning (Russo et al., 2023).

Nevertheless, despite its potential, no previous studies have systematically investigated the implementation of the GASING Method within the instructional setting of SDN 05 Sibawek. Grade III students at SDN 05 Sibawek encounter learning challenges that require an evaluative approach carefully aligned with the school's contextual conditions. The absence of empirical evidence within this setting provides a compelling rationale for conducting research on the implementation of the GASING method to determine its impact on learners' academic outcomes. The study further seeks to determine the extent to which this method can enhance students' mathematical learning outcomes and address the specific learning difficulties identified in the preliminary assessment.

Methods

This study employed a pre-experimental design using the One-Group Pretest–Posttest model to examine changes in students' mathematics learning outcomes following the implementation of the GASING method. This design was selected because it enables the researcher to measure learning outcome differences before and after the intervention within the same group, even in the absence of a control group (Capili & Anastasi, 2024). The research design used in this study is presented in Figure 1.

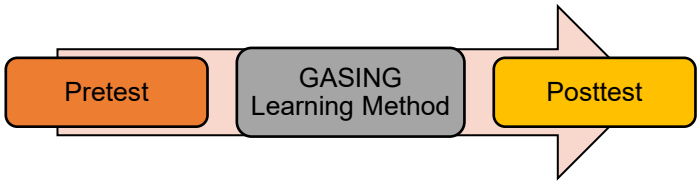

Figure 1. Research Framework: One-Group Pretest–Posttest Design

The research subjects were selected through purposive sampling based on their alignment with the study objectives (Andrade, 2020), namely Grade III students who had completed the basic mathematics curriculum. A total of 16 students from SDN 05 Sibawek participated in this study. The research instrument consisted of a learning achievement test comprising ten multiple-choice items developed according to relevant learning outcomes and competency indicators. The instrument was thoroughly validated through expert judgment to ensure content appropriateness and was subjected to a readability check with students of equivalent grade level. Only the items that met the established criteria were used in both the pretest and posttest.

The research procedure was conducted in three sequential stages. During the preparation stage, the researcher developed GASING-based learning materials, including lesson plans and instructional content. The implementation stage began with administering the pretest to obtain baseline data, followed by the learning intervention using the characteristic phases of GASING (Easy, Fun, and Enjoyable), which emphasize structured practice, conceptual reinforcement, and a gradual progression from concrete to abstract understanding. After all instructional sessions were completed, the posttest was administered to measure the final learning outcomes.

The final stage involved evaluation and data analysis, which combined descriptive and inferential statistics. Descriptive statistics were used to summarize the characteristics of the data, including measures such as the mean and score distribution. Inferential analysis included a normality test using the Shapiro–Wilk procedure to determine whether the distribution of pretest–posttest score differences met the assumption of normality. The results of this test informed the selection of the appropriate inferential technique, namely the Wilcoxon Signed-Rank Test when the data did not follow a normal distribution (Yang & Berdine, 2021; Sasmita et al., 2024). The effect size applied in the present analysis is computed using the following formula:

$$r = \frac{Z}{\sqrt{N}}$$

the resulting value of r is interpreted in its absolute form, as the sign of the Z statistic does not reflect the magnitude of the effect. Here, N denotes the total number of paired observations included in the sample, while Z represents the standardized test statistic produced by the Wilcoxon Signed-Rank Test. This measure provides a nonparametric estimation of effect magnitude that is appropriate when the assumption of normality is not met (Sari et al., 2025).

Results And Discussion

The pretest results obtained from ten multiple-choice items indicated that most students had not yet mastered the fundamental concepts satisfactorily. The pretest served not only as an initial evaluative tool but also as a benchmark for identifying significant changes following the intervention (Ghasemi & Zahediasl, 2012; Muhibbah,

2023). The low initial scores suggest that prior learning experiences were predominantly procedural. The implementation of the GASING method over three days provided a more concrete and gradual instructional approach, aligning well with the cognitive characteristics of elementary school students. After the intervention, the same instrument was used for the posttest to assess its effectiveness, and the comparative results are presented in Table 1. Figure 2 illustrates a positive shift in the distribution of students' scores after the intervention. In the pretest, most students achieved scores within the 3–4 range, whereas in the posttest the distribution shifted toward the 7–8 range, with the appearance of a score of 9 that did not emerge in the initial phase. This change in distribution pattern indicates an improvement in students' abilities following the implementation of the intervention.

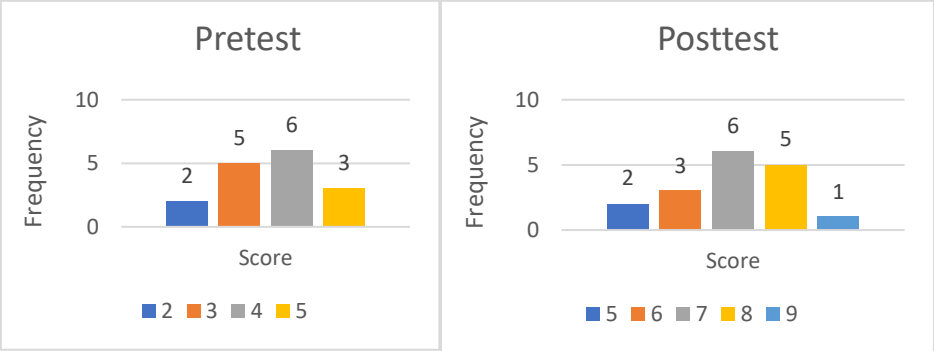

Figure 2. Distribution of Students' Pretest and Posttest Scores in Grade III

Table 1. Pre-Test and Post-Test Data of Students in Grade III of SD 05 Sibawek

No absence	Pre-Test	Post Test	Difference
1	4	7	3
2	5	8	3
3	4	7	3
4	3	8	5
5	5	9	4
6	2	5	3
7	4	8	4
8	3	6	3
9	3	5	2
10	3	7	4
11	4	8	4
12	5	6	1
13	2	6	4
14	3	7	4
15	4	7	3
16	4	8	4
Mean	3,625	7	3,375

The students' pretest scores before the intervention showed an average of 3.625. Most students scored between 2 and 5, indicating that their understanding of basic mathematical concepts was still limited. After receiving instruction using the GASING method, the average posttest score increased to 7. The comparison between the pretest and posttest means shows an improvement of 3.375 points. This increase demonstrates that the GASING method provides a learning experience that is simpler, more enjoyable, and more systematic, thereby enabling students to feel more confident when solving mathematics problems. The step-by-step and intuitive approach embedded in GASING helps students develop a deeper understanding of the concepts.

These findings align with those of Wilyam et al., (2025), who reported that the GASING method is more effective than traditional approaches in enhancing student achievement. Their study also emphasized the role of learning motivation, noting that GASING was particularly effective for students with low motivation levels. The effectiveness of GASING in the present study is also supported by previous research highlighting that instructional strategies emphasizing conceptual visualization, exploration through concrete steps, and direct learning experiences can significantly improve students' comprehension of foundational mathematical material. Experimental studies involving elementary students have shown that presenting mathematics concepts through interactive visual media can enhance students' levels of geometric thinking (Wu et al., 2024).

In the inferential analysis stage, the results of the Shapiro–Wilk test indicated that the distribution of pretest–posttest score differences was not normal ($W = 0.866$; $p = 0.024$). This finding confirms that the data do not meet the assumptions required for parametric tests. When data violate the assumptions of parametric procedures, nonparametric methods are considered more appropriate. The students' score changes were heterogeneous, with some students showing substantial improvement while others exhibited only minimal gains. This imbalance in score increases caused the distribution of differences to be skewed, preventing the formation of a symmetric normal curve (Ho & Yu, 2015). Furthermore, the GASING learning method often produced substantial score gains in certain groups, particularly among students with initially low abilities. Such conditions resulted in outlier improvements, defined as difference scores considerably larger than those of other students. The presence of outliers directly reduces the W statistic, as the Shapiro–Wilk test is highly sensitive to extreme values (Nosakhare & Bright, 2017). When the Shapiro–Wilk test yields a p-value < 0.05, the data distribution significantly deviates from normality, indicating a violation of the normality assumption (Ahadi & Zain, 2023).

Based on the results of the Wilcoxon Signed-Rank Test, the obtained Z statistic was converted into a nonparametric effect size using the formula $r = Z/\sqrt{N}$. This value is interpreted in absolute terms because the positive or negative sign of Z does not

influence the magnitude of the effect. The resulting effect size approached 1 (r = 0.879), indicating a very strong impact, as most of the variation in score changes can be attributed to the intervention. Moreover, an r value exceeding 0.50 is already categorized as a large effect (Indah & Ahmad, 2025; Zulkarnaini et al., 2025). The strength of the effect reflected by the r value aligns with the pattern of score improvement observed in the data. Most students demonstrated relatively uniform gains, typically within the range of 3 to 4 points. This consistency resulted in low variance in the difference scores (SD = 0.957), thereby reinforcing the conclusion that the observed changes were not incidental but were directly associated with the implementation of the GASING method. Therefore, based on the statistical evidence, the GASING approach demonstrates a positive and meaningful impact on students' mathematics learning outcomes in the classroom.

In addition to the cognitive improvements, classroom observations showed a clear increase in students' active participation during the learning process. Students demonstrated higher enthusiasm, asked more questions, and showed greater confidence in attempting to solve problems independently. Their responses also indicated that learning through the GASING method felt more enjoyable, engaging, and motivating, encouraging them to continue participating actively. This increase in classroom engagement suggests that GASING not only enhances academic outcomes but also fosters a more interactive and supportive learning atmosphere. These findings align with Živković et al., (2023), who reported that enjoyable learning environments contribute to higher student self-efficacy and lower levels of mathematics anxiety, ultimately improving academic performance. Teachers can make GASING method as one of the approach alternative in teaching mathematics, especially in schools base with condition means infrastructure limited such as SDN 05 Sibawek. GASING no need equipment sophisticated, but can increase effectiveness learning through design simple and systematic steps. This is in harmony with need education in the region rural areas, where limitations facility often become constraint main in delivery optimal learning.

The GASING method (Easy, Fun, and Enjoyable) has proven be one of solution for overcome low results study mathematics students. Excellence method this lies in the presentation simple concept, easy steps followed, and pleasant delivery, so student can more easy understand material (Khasanah et al., 2017). In addition, the implementation of the GASING method allows student study through visual, kinesthetic, and interactive approaches, which in turn speed up the process of understanding material. Success method this is also reflected from various research that reports improvement motivation and achievement Study student after its implementation GASING method on various level school basic. The application of GASING is proven effective in increase ability counting, solving problems, and understanding draft base mathematics, both in material addition, multiplication, and

geometry simple (Amtiran et al., 2024; Aprijon, 2020; Ramadhanti et al., 2024; Tarusu & Pokaton, 2024). Findings the give strong foundation that use GASING method at SDN 05 Sibawek can become the right alternative for increase results study mathematics student class III.

Conclusion

The findings of this study indicate a marked improvement in the mathematics performance of third-grade students at SDN 05 Sibawek following the implementation of the GASING method. Statistical analyses further substantiate the positive contribution of this pedagogical approach to students' learning outcomes. However, the generalizability of these results is constrained by several factors, particularly the single-class setting and the relatively small sample size. Accordingly, future investigations should involve larger and more heterogeneous cohorts, extend the scope of inquiry to additional mathematical domains, adopt more robust experimental designs, and consider the integration of digital learning technologies to yield a more comprehensive evaluation of the effectiveness of the GASING method.

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