



IMPLEMENTASI METODE GASING DALAM MENINGKATKAN MINAT BELAJAR MATEMATIKA SISWA SEKOLAH DASAR

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ABSTRAK

Minat belajar matematika pada siswa sekolah dasar merupakan aspek penting dalam membangun keterlibatan dan keberlanjutan proses belajar, tetapi masih menghadapi tantangan akibat pembelajaran yang cenderung abstrak dan kurang melibatkan siswa secara aktif. Penelitian ini bertujuan menganalisis implementasi metode GASING (Gampang, Asyik, dan Menyenangkan) dalam mendukung minat belajar matematika siswa sekolah dasar serta mengidentifikasi faktor yang mendukung dan menghambat penerapannya. Penelitian menggunakan pendekatan kualitatif dengan metode *Systematic Literature Review* (SLR) berdasarkan pedoman PRISMA 2020. Penelusuran literatur dilakukan melalui beberapa basis data akademik dengan rentang publikasi 2020–2026. Dari 106 dokumen yang teridentifikasi, proses penyaringan dan penilaian kelayakan menghasilkan 20 artikel yang dianalisis secara tematik. Hasil kajian menunjukkan bahwa karakteristik pembelajaran GASING yang konkret, bertahap, interaktif, menyenangkan, dan melibatkan partisipasi aktif siswa berpotensi mendukung minat dan keterlibatan siswa dalam pembelajaran matematika. Penerapan GASING juga dikaitkan dengan perkembangan kemampuan matematika serta pengalaman belajar yang lebih positif. Namun, bukti yang secara langsung mengukur minat belajar masih terbatas karena sebagian besar penelitian berfokus pada hasil belajar dan kemampuan matematis. Faktor pendukung terutama berkaitan dengan kompetensi dan peran pedagogis guru, karakteristik aktivitas pembelajaran, serta penggunaan pengalaman belajar yang konkret, sedangkan persepsi siswa, hambatan pembelajaran, dan kondisi implementasi dapat memengaruhi kualitas penerapannya. Temuan ini menunjukkan bahwa GASING berpotensi mendukung pembelajaran matematika yang lebih interaktif dan berorientasi pada pengalaman belajar siswa di sekolah dasar.

Kata kunci: matematika; metode GASING; minat belajar; sekolah dasar; *Systematic Literature Review*

ABSTRACT

Students' interest in learning mathematics is an important aspect of sustaining engagement and supporting meaningful learning in elementary education. However, mathematics instruction may still be experienced as abstract and provide limited opportunities for active student participation. This study aims to analyze the implementation of the GASING (Gampang, Asyik, and Menyenangkan) method in supporting elementary students' interest in learning mathematics and to identify factors that support or inhibit its implementation. A qualitative approach was employed using a *Systematic Literature Review* (SLR) based on the PRISMA 2020 guidelines. The literature search was conducted through several academic databases covering publications from 2020 to 2026. Of the 106 documents identified, the screening and eligibility assessment resulted in 20 articles for thematic analysis. The findings indicate that the characteristics of GASING learning, including concrete activities, gradual progression, interactive and enjoyable learning, and active student participation, may support students' interest and engagement in mathematics learning. The implementation of GASING was also associated with improvements in mathematical abilities and more positive learning experiences. However, direct evidence measuring learning interest remains limited because most studies have focused on learning outcomes and mathematical abilities. Supporting factors are mainly related to teacher competence and pedagogical roles, learning activities, and the use of concrete learning experiences, while students' perceptions, learning obstacles, and implementation conditions may influence the quality of its



application. These findings suggest that GASING has the potential to support more interactive mathematics learning that is oriented toward students' learning experiences in elementary education.

Keywords: GASING method; learning interest; mathematics; Systematic Literature Review; elementary school

INTRODUCTION

Mathematics learning in elementary school plays an important role in developing students' ability to understand concepts, think logically, and solve problems systematically. However, mathematics is still often perceived as a difficult subject, which may influence students' engagement and responses during the learning process. Jalal (2022) found that elementary school students had varied perceptions of mathematics, including perceptions that mathematics was difficult, although they recognized its importance in learning. This condition indicates that successful mathematics learning is determined not only by students' mastery of mathematical content but also by their interest and engagement during the learning process. Learning interest is an important affective dimension because it is associated with students' willingness to participate and engage in learning activities and is related to mathematics achievement (Munthe & Pasaribu, 2023). Therefore, strengthening students' interest needs to be considered as part of efforts to improve mathematics learning at the elementary school level.

Students' interest in mathematics is closely related to the learning experiences provided in the classroom. Learning activities that emphasize procedural delivery and repetitive exercises without providing meaningful opportunities for participation may make mathematics less engaging for students. Ramadhanti et al. (2024) reported that mathematics could be perceived by students as difficult, boring, and tiring, while the implementation of the GASING method provided a learning experience that was easier and more enjoyable. Gou et al. (2024) also directly examined the GASING method in relation to students' mathematics learning interest and reported positive findings. These results suggest that learning approaches that provide concrete, gradual, enjoyable, and participatory experiences may create more favorable conditions for students to engage with mathematics.

The importance of learning interest is also reflected in broader research on mathematics education. Prastitasari et al. (2022) examined elementary students' mathematics learning interest from a gender perspective and found no significant difference in learning interest based on gender. This finding suggests that students' interest cannot be understood solely through demographic characteristics but should also be considered in relation to the learning environment and experiences provided to students. Munthe and Pasaribu (2023) further showed that learning interest and motivation were associated with mathematics achievement. Meanwhile, Ramadhani et al. (2026), through a *systematic literature review*, identified self-efficacy and learning interest as important affective dimensions in mathematics education, although research attention has not been equally distributed across these constructs. These findings strengthen the need to examine learning interest as an important component of mathematics learning rather than treating it only as a secondary consequence of cognitive achievement.

Various instructional innovations have been developed to address students' difficulties and increase engagement in mathematics learning. Hidayati (2025), through a systematic review of learning obstacles, showed that mathematics learning difficulties remain an important issue that requires attention to students' learning processes and experiences. At the same time, Khansa and Arfinanti (2026) found that research on mathematics learning interest has increasingly examined application-based learning media and digital tools. These developments demonstrate the diversity of approaches used to support mathematics learning interest.

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Nevertheless, approaches that combine concrete experiences, gradual learning, active participation, and enjoyable activities also require systematic examination, particularly in elementary mathematics education. In this context, the GASING method is relevant because its learning characteristics emphasize making mathematics easier, enjoyable, and accessible through structured and active learning experiences.

The GASING method is an approach to mathematics learning that emphasizes simple, enjoyable, and gradual experiences in understanding mathematical concepts. Its implementation may involve concrete activities, systematic practice, interaction, and active student participation. Several studies have reported positive findings concerning the use of GASING in elementary mathematics learning. Sunarti (2021) reported improved mathematics learning outcomes following the implementation of GASING in elementary school. Damopolii et al. (2024) similarly found improvements in mathematics learning related to multiplication operations. Ramadhanti et al. (2024) reported improvements in learning outcomes for two-digit addition, while Anggraini et al. (2026) found that interactive GASING using number cards supported the development of basic arithmetic skills among first-grade students. Safitri et al. (2025) also reported improvements in procedural understanding of multiplication, and Puspitasari et al. (2026) found improvements in mathematics learning outcomes, calculation accuracy, and students' ability to solve two-digit multiplication problems. These findings indicate that GASING has been studied primarily as an approach for supporting students' mathematical abilities and learning outcomes.

Other research has expanded the understanding of GASING beyond specific mathematics skills. Matahelumual and Yohamintin (2025) examined the relationship between GASING and students' mathematical understanding, while Baity et al. (2026) highlighted the role of GASING in pedagogical transformation from the teacher's perspective. These studies suggest that the implementation of GASING involves not only the presentation of mathematical content but also changes in how learning activities are organized and facilitated. However, evidence from outside the elementary school context needs to be interpreted carefully. For example, Daullu et al. (2025) examined GASING among first-year university students, providing supporting evidence concerning the broader application of the method but not direct evidence of its implementation in elementary education. Therefore, evidence from elementary school studies needs to remain the primary basis for interpreting the role of GASING in the context of this study.

The learning experience created through concrete and active mathematics activities is also relevant to understanding students' responses to mathematics. Research on embodied cognition shows that mathematical learning may involve relationships between cognitive processes, bodily activities, gestures, and interaction with the learning environment (Ma'allaili et al., 2024; Surahmi et al., 2026). Diana and Mahmudah (2025) similarly demonstrated that bodily activities and social interaction can provide meaningful experiences when elementary students explore mathematical concepts. Although these studies did not examine GASING directly, they provide supporting evidence for understanding why concrete and active learning experiences may be relevant to students' engagement with mathematics. Such evidence is particularly relevant to GASING because the method emphasizes learning experiences that move from accessible and concrete activities toward more systematic mathematical understanding.

Despite the growing number of studies on GASING, the existing literature still shows an important limitation. Most studies have focused on cognitive outcomes, including learning achievement, arithmetic skills, multiplication, procedural understanding, and mathematical



understanding (Sunarti, 2021; Damopolii et al., 2024; Ramadhanti et al., 2024; Safitri et al., 2025; Matahelumual & Yohamintin, 2025; Puspitasari et al., 2026). Only a limited number of studies have directly examined students' learning interest in relation to GASING, with Gou et al. (2024) providing the clearest evidence in the reviewed literature. Meanwhile, research on learning interest and affective experiences in mathematics has developed through different approaches and contexts, but has not been systematically connected to the characteristics of GASING learning. This creates a gap in understanding how the concrete, gradual, interactive, and enjoyable characteristics of GASING may relate to students' interest and engagement in mathematics learning.

The research gap can therefore be identified in three areas. First, existing GASING research is predominantly oriented toward cognitive outcomes, while learning interest as an affective dimension has received comparatively less direct attention. Second, although studies have reported positive learning experiences and improvements in mathematical performance, the evidence connecting specific characteristics of GASING implementation with students' interest and engagement has not been systematically synthesized. Third, supporting research concerning students' perceptions, learning obstacles, embodied experiences, and affective responses has largely developed separately from research on GASING. A systematic synthesis is therefore needed to bring these strands of evidence together while maintaining a clear distinction between direct evidence from GASING studies and supporting evidence from broader mathematics learning research.

Based on this gap, this study employs a *Systematic Literature Review* (SLR) to identify, evaluate, and synthesize research findings concerning the implementation of the GASING method and its potential contribution to elementary students' interest in learning mathematics. The review focuses on studies published between 2020 and 2026 and examines the characteristics of GASING implementation, evidence related to learning interest and engagement, students' mathematics learning experiences, and factors that may support or inhibit implementation. Studies directly examining GASING in elementary education are treated as the primary evidence, while studies concerning broader affective, experiential, and embodied dimensions of mathematics learning are used as supporting evidence for interpretation.

Accordingly, this study aims to analyze the implementation of the GASING method in supporting elementary students' interest in learning mathematics, identify practices and factors that support or inhibit its implementation, and interpret how the characteristics of GASING learning are related to students' mathematics learning experiences. The findings are expected to contribute to a more balanced understanding of GASING by examining not only its reported contribution to mathematical learning outcomes but also its potential relationship with students' interest, engagement, and learning experiences. The study may also provide a basis for future research to examine learning interest as a primary outcome through stronger comparative and longitudinal designs.

METHODS

This study employed a qualitative approach using a *Systematic Literature Review* (SLR) to identify, evaluate, and synthesize research findings concerning the implementation of the GASING method and its potential contribution to students' mathematics learning interest and learning experiences. The review was guided by the PRISMA 2020 framework to ensure a systematic and transparent process of literature identification, screening, eligibility assessment, and inclusion. The review focused on studies published between 2020 and 2026, with particular

attention to the implementation of the GASING method in mathematics learning, students' learning interest, engagement, affective responses, and learning experiences.

The literature search was conducted through Google Scholar, Scopus, DOAJ, SINTA, Garuda, and ResearchGate using combinations of the keywords "GASING method," "GASING mathematics," "learning interest," "mathematics learning," and "elementary school," combined with the Boolean operators AND and OR. The inclusion criteria were studies published between 2020 and 2026, available as full-text articles, discussing the GASING method or mathematics learning experiences relevant to the focus of the review, and reporting empirical findings related to mathematics learning, learning interest, engagement, motivation, mathematical understanding, or students' affective experiences. Studies that were purely conceptual, duplicate publications, articles without accessible full texts, and publications that did not provide findings relevant to the research focus were excluded. Studies conducted outside the elementary school context were not considered as primary evidence of GASING implementation in elementary education but could be used as supporting evidence when they contributed to the interpretation of students' mathematics learning experiences or affective dimensions.

The literature selection process consisted of identification, screening, eligibility assessment, and final inclusion following the PRISMA 2020 framework. The initial search identified 106 documents. After the removal of duplicates and screening of titles and abstracts, 58 documents remained for further assessment. Full-text assessment was then conducted based on the predetermined inclusion and exclusion criteria, resulting in 27 potentially relevant articles. After the eligibility assessment, 20 articles were included in the final synthesis and analysis. The selection process and the number of records at each stage are presented in Figure 1.

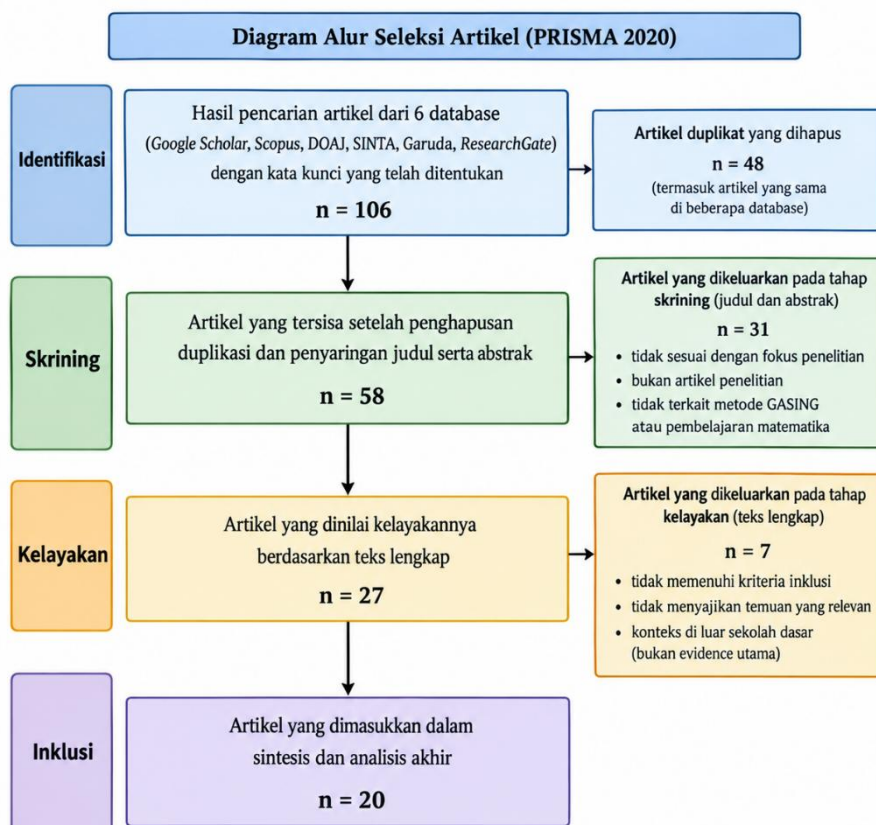


Figure 1. PRISMA flow diagram of the literature selection process



Data from the 20 selected articles were extracted based on publication characteristics, research context, research design, learning level, characteristics of GASING implementation, learning outcomes, evidence related to students' learning interest and engagement, and supporting or inhibiting factors. The selected studies were then analyzed using thematic synthesis to identify recurring patterns across the literature. The analysis focused on the characteristics of GASING implementation, including concrete learning activities, gradual presentation of mathematical concepts, active participation, interactive activities, and repeated practice, as well as their relationship with students' learning experiences and affective responses. Findings from studies directly examining GASING in elementary education were treated as the primary evidence, while studies addressing broader mathematics learning experiences, affective responses, or embodied learning were used as supporting evidence for interpretation. The synthesized findings were subsequently organized into themes concerning GASING implementation, learning interest and affective experiences, and factors supporting or inhibiting implementation. Because this study analyzed previously published literature and did not involve direct participation of human subjects, ethical approval was not required.

RESULTS AND DISCUSSION

Results

Synthesis of the Reviewed Studies

The synthesis of this study involved 20 articles listed in the reference section. The articles were analyzed to identify patterns concerning the implementation of the GASING method, students' mathematics learning interest, learning experiences, and factors associated with students' engagement in mathematics learning. The reviewed studies were not treated as having the same research focus because several examined GASING directly, while others provided supporting evidence concerning learning interest, mathematics learning experiences, embodied learning, or affective responses. Therefore, the synthesis was organized according to the contribution of each study to the main research focus.

Table 1 presents the characteristics and analytical focus of the 20 reviewed articles. The table was developed to distinguish studies that directly examined GASING from studies that provided supporting evidence for understanding learning interest and mathematics learning experiences.

Table 1. Characteristics and Analytical Focus of the Reviewed Articles

No.	Author(s)	Year	Main Topic	Educational Context	Contribution to the Synthesis
1	Sunarti	2021	GASING and mathematics learning outcomes	Elementary school	Evidence of GASING implementation and mathematics learning improvement
2	Damopolii et al.	2024	GASING and multiplication	Elementary school	Evidence of GASING implementation in arithmetic learning
3	Baity et al.	2026	GASING and pedagogical transformation	Elementary school	Evidence concerning teacher practices in GASING implementation
4	Diana & Mahmudah	2025	Embodied mathematics learning	Elementary school	Evidence concerning concrete and experiential mathematics learning



No.	Author(s)	Year	Main Topic	Educational Context	Contribution to the Synthesis
5	Gou et al.	2024	GASING, learning interest, and learning outcomes	Mathematics learning	Direct evidence concerning GASING and learning interest
6	Jalal	2022	Students' perceptions of mathematics	Elementary school	Supporting evidence concerning students' affective responses to mathematics
7	Khansa & Arfinanti	2026	Learning media and mathematics learning interest	Mathematics education	Supporting evidence concerning approaches for increasing learning interest
8	Ma'allaili et al.	2024	Embodied cognition in mathematics	Junior high school	Supporting evidence concerning embodied mathematical experiences
9	Munthe & Pasaribu	2023	Learning interest, motivation, and achievement	Mathematics learning	Evidence of the importance of learning interest in mathematics
10	Puspitasari et al.	2026	GASING and two-digit multiplication	Elementary school	Evidence of GASING implementation in multiplication learning
11	Ramadhanti et al.	2024	GASING and two-digit addition	Elementary school	Evidence of GASING implementation in arithmetic learning
12	Surahmi et al.	2026	Embodied cognition and early numeracy	Early childhood education	Supporting evidence concerning concrete and embodied learning
13	Anggraini et al.	2026	Interactive GASING and arithmetic skills	Elementary school	Evidence of interactive GASING implementation
14	Daullu et al.	2025	GASING and basic calculation	Higher education	Supporting evidence concerning GASING beyond elementary education
15	Hidayati	2025	Mathematics learning obstacles	Mathematics education	Supporting evidence concerning barriers in mathematics learning
16	Matahelumual & Yohamintin	2025	GASING and mathematical understanding	Elementary school	Evidence of GASING and mathematical understanding
17	Prastitasari et al.	2022	Mathematics learning interest	Elementary school	Evidence concerning students' mathematics learning interest
18	Ramadhani et al.	2026	Self-efficacy and mathematics learning interest	Mathematics education	Supporting evidence concerning affective dimensions of mathematics
19	Safitri et al.	2025	GASING and procedural understanding	Elementary school	Evidence of GASING and procedural mathematics learning

No.	Author(s)	Year	Main Topic	Educational Context	Contribution to the Synthesis
20	Sutrisno et al.	2026	Mathematics anxiety and learning experiences	Elementary school	Supporting evidence concerning students' affective learning experiences

Table 1 shows that the reviewed literature has different levels of directness in relation to the main focus of the study. Studies by Sunarti (2021), Damopolii et al. (2024), Gou et al. (2024), Puspitasari et al. (2026), Ramadhanti et al. (2024), Anggraini et al. (2026), Matahelumual and Yohamintin (2025), and Safitri et al. (2025) provide direct evidence concerning GASING implementation. Meanwhile, studies by Jalal (2022), Munthe and Pasaribu (2023), Prastitasari et al. (2022), and Ramadhani et al. (2026) strengthen the affective dimension of the synthesis. Studies concerning embodied cognition and learning experiences further provide a conceptual and empirical basis for understanding how concrete and active learning experiences may influence students' responses to mathematics (Diana & Mahmudah, 2025; Ma'allaili et al., 2024; Surahmi et al., 2026; Sutrisno et al., 2026).

Patterns of GASING Implementation

The first pattern identified from the synthesis concerns the characteristics of GASING implementation. The studies that directly examined GASING generally focused on elementary mathematics topics such as addition, multiplication, arithmetic skills, procedural understanding, mathematical understanding, and general learning outcomes. These studies indicate that GASING is implemented through learning activities that emphasize concrete representation, gradual development of concepts, repeated practice, and active student participation.

Table 2. Synthesis of Findings Related to GASING Implementation

Analytical Aspect	Evidence from the Reviewed Articles	Synthesis Pattern
Concrete learning	Sunarti (2021); Damopolii et al. (2024); Ramadhanti et al. (2024)	Mathematical concepts are introduced through more concrete and accessible learning experiences
Gradual learning	Sunarti (2021); Gou et al. (2024); Safitri et al. (2025)	Learning progresses from simpler to more complex mathematical understanding
Active participation	Damopolii et al. (2024); Anggraini et al. (2026)	Students are encouraged to engage directly in mathematical activities
Interactive activities/media	Anggraini et al. (2026)	Interactive materials support student involvement in arithmetic learning
Repeated practice	Ramadhanti et al. (2024); Puspitasari et al. (2026)	Repetition is used to strengthen students' mathematical procedures
Teacher pedagogical role	Baity et al. (2026)	GASING implementation requires appropriate teacher organization and pedagogical adaptation
Mathematical understanding	Matahelumual & Yohamintin (2025)	GASING is associated with students' development of mathematical understanding
Procedural understanding	Safitri et al. (2025)	GASING supports students' procedural understanding, particularly in multiplication

Table 2 indicates that GASING implementation is characterized by a combination of concrete learning, gradual progression, active participation, and repeated practice. The recurring presence of these characteristics across the reviewed studies provides a common



pattern despite differences in learning topics and research designs. The implementation therefore appears to influence not only what students learn but also how they participate in mathematics learning.

GASING, Learning Interest, and Mathematics Learning Experience

The second pattern concerns the relationship between GASING and students' interest in mathematics learning. Among the reviewed literature, Gou et al. (2024) provides the most direct evidence because learning interest was explicitly examined alongside the implementation of GASING. Other studies contribute indirectly by showing changes in students' engagement, learning experiences, or responses during mathematics learning.

Table 3. Synthesis of Evidence Related to Learning Interest and Affective Experience

Aspect	Relevant Studies	Synthesis
Learning interest	Gou et al. (2024)	GASING is directly associated with students' interest in mathematics learning
Interest and achievement	Munthe & Pasaribu (2023)	Learning interest is an important affective factor associated with mathematics achievement
Elementary students' interest	Prastitasari et al. (2022)	Learning interest is an important dimension of elementary mathematics learning
Mathematics perception	Jalal (2022)	Students' perceptions influence their responses toward mathematics learning
Learning media and interest	Khansa & Arfinanti (2026)	Learning media represent one approach for supporting mathematics learning interest
Embodied experience	Diana & Mahmudah (2025); Ma'allaili et al. (2024); Surahmi et al. (2026)	Direct and embodied experiences provide an important dimension of mathematics learning
Negative affective experience	Sutrisno et al. (2026)	Mathematics learning may also involve anxiety and other negative affective responses
Affective research trends	Ramadhani et al. (2026)	Learning interest remains an important affective dimension alongside self-efficacy

Table 3 shows that learning interest should be understood as part of students' broader mathematics learning experience. The literature does not provide equally strong direct measurements of learning interest across all GASING studies. Instead, evidence concerning learning interest is complemented by findings related to students' perceptions, engagement, embodied experiences, and affective responses. This distinction is important because most GASING studies have primarily emphasized cognitive outcomes rather than learning interest as the main outcome.

Cross-Study Synthesis

The comparison across the 20 articles reveals three major patterns. First, the dominant focus of GASING research is still cognitive, particularly mathematics learning outcomes, arithmetic skills, multiplication, procedural understanding, and mathematical understanding (Sunarti, 2021; Damopolii et al., 2024; Ramadhanti et al., 2024; Puspitasari et al., 2026;



Anggraini et al., 2026; Matahelumual & Yohamintin, 2025; Safitri et al., 2025). Second, direct research connecting GASING with learning interest is more limited, with Gou et al. (2024) providing the clearest evidence within the reviewed literature. Third, studies concerning embodied cognition and mathematics learning experiences provide supporting evidence for understanding the experiential mechanisms through which concrete and active learning may shape students' responses to mathematics (Diana & Mahmudah, 2025; Ma'allaili et al., 2024; Surahmi et al., 2026).

The third table also shows that several factors repeatedly appear in relation to students' engagement. Concrete activities, interactive learning materials, gradual presentation of concepts, and opportunities for active participation are recurring characteristics of the reviewed GASING studies. At the same time, teacher pedagogical capacity and students' initial perceptions or learning obstacles may influence the quality of implementation (Baity et al., 2026; Jalal, 2022; Hidayati, 2025).

Overall, the synthesis of the 20 articles indicates that GASING has been predominantly studied in relation to cognitive improvement, while its relationship with students' mathematics learning interest has received less direct attention. Nevertheless, the recurring characteristics of GASING concrete learning, gradual progression, active participation, interactive activities, and repeated practice provide a consistent basis for understanding its potential contribution to students' engagement and interest in mathematics. The findings establish the empirical basis for the subsequent discussion of how these characteristics may shape students' learning experiences and learning interest.

Discussion

The synthesis of 20 articles indicates that the GASING method has greater evidence in improving cognitive aspects of elementary mathematics learning than in directly measuring students' learning interest. Most studies examining GASING reported positive findings related to arithmetic skills, multiplication, procedural understanding, mathematical understanding, and general learning outcomes (Sunarti, 2021; Damopolii et al., 2024; Ramadhanti et al., 2024; Puspitasari et al., 2026; Anggraini et al., 2026; Matahelumual & Yohamintin, 2025; Safitri et al., 2025). This pattern shows that GASING has been consistently positioned as a practical approach for helping students understand mathematical concepts and procedures. However, the dominance of cognitive outcomes also indicates that the affective dimension, particularly learning interest, has not received comparable empirical attention. Therefore, the contribution of GASING to learning interest needs to be understood not only from direct measurements of interest but also from the learning experiences created during its implementation.

The findings suggest that the characteristics of GASING provide an important basis for developing students' engagement with mathematics. The reviewed studies repeatedly describe learning activities involving concrete representations, gradual progression, active practice, and interaction with mathematical tasks (Sunarti, 2021; Damopolii et al., 2024; Ramadhanti et al., 2024; Anggraini et al., 2026). These characteristics reduce the distance between abstract mathematical concepts and students' immediate learning experiences. The use of interactive activities and concrete learning materials can also create opportunities for students to participate rather than merely receive explanations from the teacher. Baity et al. (2026) further shows that the implementation of GASING requires pedagogical adaptation by teachers, indicating that the quality of the learning experience depends not only on the method but also on how teachers organize and facilitate its stages.



The relationship between GASING and learning interest is particularly evident in studies that directly examine students' affective responses. Gou et al. (2024) explicitly connects the GASING method with students' learning interest and mathematics learning outcomes. This finding is consistent with Munthe and Pasaribu (2023), who identify learning interest and motivation as important factors associated with mathematics achievement. Prastitasari et al. (2022) also demonstrates that learning interest is an important dimension in elementary mathematics learning, while Jalal (2022) highlights the role of students' perceptions of mathematics in shaping their learning responses. These findings indicate that interest should not be viewed as a separate outcome from mathematics learning. When students perceive mathematical activities as accessible, engaging, and meaningful, the learning process can provide conditions that support their willingness to participate and sustain attention.

The experiential dimension provides another explanation for the potential relationship between GASING and learning interest. Studies on embodied cognition indicate that mathematical learning can involve interaction between students' cognitive processes, bodily activity, and learning environments (Ma'allaili et al., 2024; Surahmi et al., 2026). Diana and Mahmudah (2025) similarly demonstrates the importance of concrete and direct experiences in students' exploration of mathematical concepts. These findings are relevant to GASING because its learning activities emphasize concrete experiences before students move toward more abstract mathematical representations. In this context, the potential contribution of GASING to learning interest may arise from the quality of students' experiences during learning rather than from the method label itself. The method becomes meaningful when its concrete, active, and gradual activities enable students to experience mathematics as something that can be explored and understood.

The synthesis also shows that positive mathematics learning experiences are not automatic. Students' perceptions, learning obstacles, and affective conditions may influence their responses to mathematics (Jalal, 2022; Hidayati, 2025). Sutrisno et al. (2026) shows that mathematics learning can involve negative affective experiences, particularly mathematics anxiety. This finding is important because a method intended to make mathematics easier and more enjoyable still requires an appropriate classroom environment and teacher support. Interactive activities, concrete materials, and gradual learning may facilitate engagement, but teachers need to ensure that students are given sufficient opportunities to participate, practice, and receive feedback. Thus, the effectiveness of GASING should be understood as an interaction between the characteristics of the method, teacher implementation, learning materials, and students' existing experiences with mathematics.

Another important finding is the gap between the number of studies reporting cognitive improvement and the number directly examining learning interest. Research by Sunarti (2021), Damopolii et al. (2024), Ramadhanti et al. (2024), Puspitasari et al. (2026), Anggraini et al. (2026), Matahelumual and Yohamintin (2025), and Safitri et al. (2025) provides substantial evidence concerning mathematical performance, but these outcomes cannot automatically be interpreted as evidence of increased learning interest. Similarly, evidence from Daullu et al. (2025) should be interpreted cautiously because the study concerns university students rather than elementary students. Therefore, the present synthesis supports the potential relationship between GASING and learning interest but does not justify the claim that GASING has been conclusively proven to increase learning interest across elementary contexts.

The findings have implications for mathematics instruction and future research. At the instructional level, GASING can be considered a relevant approach when teachers seek to create mathematics learning that is concrete, gradual, interactive, and participatory. At the research



level, future studies should measure learning interest as a primary outcome rather than treating it only as a secondary implication of improved mathematics achievement. Research with stronger comparative designs and longer observation periods is also needed to determine whether increased engagement during GASING-based activities is sustained over time. Such studies would strengthen the evidence concerning the affective contribution of GASING and clarify the mechanisms through which concrete and enjoyable mathematics learning experiences influence students' sustained interest in learning mathematics.

CONCLUSION

The synthesis of 20 articles indicates that the GASING method is relevant to elementary mathematics learning because it emphasizes concrete, gradual, interactive, and participatory learning experiences. The reviewed studies generally show positive developments in mathematics learning, particularly in arithmetic skills, multiplication, procedural understanding, mathematical understanding, and learning achievement. Although direct evidence concerning learning interest is more limited, the overall findings indicate that the learning characteristics of GASING can create conditions that support students' engagement and interest in mathematics. Learning interest is therefore closely related to the quality of learning experiences provided during the implementation of the method.

The study concludes that the GASING method has potential to support students' interest in learning mathematics, but this finding should not be interpreted as definitive evidence of a causal effect in all elementary school contexts. The existing literature is still dominated by studies focusing on cognitive outcomes, while learning interest has received less direct investigation. Future research should therefore examine learning interest as a primary outcome using comparative and longitudinal designs and investigate how concrete activities, gradual learning, teacher facilitation, and students' affective experiences contribute to sustained interest in mathematics learning.

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