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REALISTIC MATHEMATICS EDUCATION IN MATHEMATICS LEARNING: A SYSTEMATIC LITERATURE REVIEW OF RESEARCH TRENDS AND IMPACTS

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ABSTRACT

Penelitian ini bertujuan mensintesis bukti empiris mengenai implementasi Realistic Mathematics Education (RME) dalam pembelajaran matematika serta mengidentifikasi tren penelitian, kontribusi tematik, dan pengaruhnya terhadap kemampuan matematis siswa. Meskipun penelitian RME terus berkembang, kajian sebelumnya masih bersifat deskriptif, terfragmentasi, dan belum memberikan sintesis tematik yang terintegrasi lintas kemampuan, jenjang pendidikan, dan konteks implementasi. Penelitian ini menggunakan Systematic Literature Review (SLR) dengan pedoman PRISMA 2020. Artikel diperoleh dari Scopus, ERIC, dan Google Scholar melalui strategi pencarian terstruktur. Seleksi dilakukan melalui tahap identifikasi, penyaringan, kelayakan, dan inklusi, sehingga diperoleh 24 artikel empiris (2021–2025). Kualitas studi dianalisis menggunakan instrumen penilaian terstruktur, sedangkan data dianalisis dengan thematic synthesis. Hasil menunjukkan bahwa penelitian RME berfokus pada tiga domain utama, yaitu pemahaman konsep, pemecahan masalah dan literasi matematika, serta Higher Order Thinking Skills (HOTS). Efektivitas RME dipengaruhi oleh kualitas desain konteks, peran guru, dan kesesuaian proses matematisasi. Namun, terdapat variasi hasil antar studi yang menunjukkan bahwa dampak RME bersifat kontekstual. Secara keseluruhan, RME cenderung memberikan kontribusi positif terhadap kemampuan matematis siswa, namun tidak bersifat universal. Studi ini memberikan sintesis terintegrasi yang menghubungkan tren penelitian, hasil pembelajaran, dan faktor implementasi.

This study aims to synthesize empirical evidence on the implementation of Realistic Mathematics Education (RME) in mathematics learning and to identify research trends, thematic contributions, and its impact on students' mathematical competencies. Although research on RME has continued to expand, previous reviews have remained largely descriptive and fragmented, offering limited integrated thematic synthesis across mathematical competencies, educational levels, and implementation contexts. This study employed a Systematic Literature Review (SLR) guided by the PRISMA 2020 framework. Articles were retrieved from Scopus, ERIC, and Google Scholar through a structured search strategy. The selection process involved identification, screening, eligibility assessment, and inclusion stages, resulting in 24 empirical studies published between 2021 and 2025. Study quality was evaluated using a structured quality assessment instrument, while data were analyzed through thematic synthesis. The findings indicate that RME research is concentrated in three major domains: conceptual understanding, mathematical problem-solving and literacy, and Higher Order Thinking Skills (HOTS). The effectiveness of RME is influenced by the quality of contextual task design, teachers' instructional practices, and the alignment of mathematization processes. However,

variations across studies suggest that the impact of RME is context-dependent rather than universally consistent. Overall, RME demonstrates a positive contribution to students' mathematical competencies, although its effectiveness varies across educational settings. This review provides an integrated synthesis linking research trends, learning outcomes, and key implementation factors, thereby offering a comprehensive perspective on the current state of RME research and directions for future investigations.

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1. INTRODUCTION

Mathematics education plays a fundamental role in fostering higher-order thinking skills, including logical, critical, and analytical reasoning, as well as problem-solving abilities, which are recognized as essential competencies for the twenty-first century (OECD, 2023). Nevertheless, evidence from both international and national studies indicates that students' mathematical literacy achievement remains relatively low and has shown limited improvement over the past decade (OECD, 2023; Amanda et al., 2025). This situation suggests a persistent gap between the intended goals of mathematics education and actual learning outcomes, particularly regarding conceptual understanding and the ability to apply mathematical knowledge in real-world situations (Taqiya & Juandi, 2023). Consequently, a deeper examination of pedagogical factors influencing the quality of mathematics instruction is warranted (Mufti, 2024).

The persistence of these challenges is closely associated with the predominance of procedural and teacher-centered instructional practices, where students are often encouraged to memorize formulas rather than develop meaningful conceptual understanding (Nurlatifah et al., 2025). As a result, many students encounter difficulties when solving contextual problems that require reasoning, interpretation, and connections among mathematical concepts (Aningsih & Ansida, 2022). Previous studies have further demonstrated that mathematics instruction lacking connections to authentic real-life situations may reduce students' engagement and learning motivation (Fitriyana et al., 2023). These conditions highlight the urgent need for instructional approaches that promote meaningful and context-based mathematical learning (Sukasno et al., 2023).

One pedagogical approach that has been theoretically and empirically recognized as a promising response to these challenges is Realistic Mathematics Education (RME). RME is grounded in Freudenthal's theory of *mathematics as a human activity*, which emphasizes that mathematics should be learned through a process of guided reinvention based on meaningful real-world contexts (Freudenthal, 1991). Extending this perspective, Gravemeijer (1994) emphasized the principle of *progressive mathematization*, whereby learners gradually transition from informal contextual reasoning toward formal mathematical concepts. Furthermore, Treffers

(2012) identified the core principles of RME—namely the use of context, models, students' contributions, and interactivity—as foundational elements for meaningful mathematics learning (Gravemeijer & Terwel, 2000). Accordingly, RME should be viewed not merely as an instructional approach but also as a theoretical framework for understanding how students construct mathematical knowledge (Lidia et al., 2025).

A growing body of empirical research has reported positive effects of RME on various dimensions of students' mathematical competencies. Previous studies have documented improvements in mathematical problem-solving, mathematical literacy, and conceptual understanding through RME-based instruction (Taqiya & Juandi, 2023; Nurlatifah et al., 2025). In addition, RME has been shown to enhance students' active participation and foster the development of higher-order thinking skills (Mutik et al., 2024; Siswanto et al., 2025). Despite these promising findings, existing evidence remains dispersed across different educational contexts, educational levels, and outcome variables, making it difficult to develop a comprehensive understanding of the overall effectiveness of RME (Paradesa et al., 2025).

Although research on RME continues to expand, several important limitations remain evident in the existing literature. First, most studies focus on specific mathematical competencies and therefore provide only a partial understanding of RME's educational impact (Mufti, 2024). Second, many investigations are confined to particular educational levels or local contexts, limiting the generalizability of findings and restricting broader insights into global implementation patterns (Febrilia et al., 2025). Third, systematic efforts to synthesize empirical findings across studies remain relatively scarce (Afsari et al., 2021). Consequently, a significant research gap persists regarding the availability of a comprehensive mapping of RME's contributions across multiple dimensions of mathematics learning.

Furthermore, previous systematic literature reviews on RME exhibit methodological and analytical limitations. Several reviews primarily summarize findings descriptively without conducting in-depth thematic analyses or categorizing evidence according to specific learning outcomes and instructional variables (Risdiyanti et al., 2024). Moreover, limited attention has been given to integrating research trends, effectiveness across different mathematical competencies, and implementation patterns within a single systematic analytical framework (Muhadi et al., 2025). Therefore, there is a need for a more comprehensive systematic review employing a deeper analytical approach than those adopted in previous studies.

To clarify the position of the present study relative to existing literature reviews, a comparison of previous studies' focus, limitations, and contributions is presented in Table 1.

Table 1. Positioning of the Present Study in Relation to Previous Literature Reviews

Study	Review Focus	Limitations of Previous Studies	Contribution of the Present Study
Afsari et al. (2021)	Review of the effectiveness of Realistic Mathematics Education (RME) in mathematics learning	Did not integrate evidence across multiple mathematical competencies and implementation factors	Integrates the effects of RME on various mathematical competencies and examines key implementation factors influencing its effectiveness
Taqiya & Juandi (2023)	RME and mathematical literacy	Focused on a single mathematical competency	Provides a comprehensive analysis of RME's contributions across multiple mathematical competencies

Risdiyanti et al. (2024)	Research trends and implementation of RME	Primarily descriptive and lacking in-depth thematic synthesis	Employs thematic synthesis and critical cross-study analysis to generate deeper insights
Muhadi et al. (2025)	Implementation of RME across different educational contexts	Did not integrate research trends, effectiveness, and implementation patterns within a unified analytical framework	Integrates publication trends, effectiveness outcomes, implementation patterns, and pedagogical implications into a single analytical framework
Present Study	Systematic Literature Review of RME in mathematics education (2021–2025)	—	Provides a comprehensive synthesis of research trends, RME's contributions to various mathematical competencies, implementation patterns across educational contexts, and pedagogical implications

Source: *Developed by the authors based on literature synthesis.*

As illustrated in Table 1, the present study offers several distinctive contributions. First, it not only maps research trends in RME but also synthesizes its contributions to a broad range of students' mathematical competencies. Second, it integrates empirical findings from diverse educational contexts to identify implementation patterns more comprehensively. Third, beyond providing a descriptive overview of previous studies, this review employs thematic synthesis and critical analysis to examine factors influencing the effectiveness of RME implementation. Consequently, the study is expected to provide stronger theoretical and practical contributions than previous reviews.

Based on the identified research gaps, this study aims to conduct a Systematic Literature Review (SLR) on the implementation of Realistic Mathematics Education in mathematics learning. The novelty of this review lies in its integration of thematic analysis that not only maps research trends but also classifies RME's contributions across various mathematical competencies and identifies implementation patterns across different educational contexts. Accordingly, this review moves beyond a purely descriptive approach and adopts a comprehensive analytical perspective, thereby offering new insights into the contemporary RME literature (Gravemeijer & Terwel, 2000; Paradesa et al., 2025).

Specifically, this study addresses the following research questions:

a) What are the prevailing research trends regarding the implementation of RME in mathematics education?
b) How does RME contribute to the development of various students' mathematical competencies?
c) What implementation patterns of RME emerge across different educational contexts?
d) What pedagogical implications can be derived from research findings on RME in mathematics education?

The findings of this review are expected to contribute theoretically to the advancement of Realistic Mathematics Education scholarship and practically to support educators and researchers in designing mathematics instruction that is more contextualized, meaningful, and conducive to the development of students' higher-order thinking skills (Freudenthal, 2002; Gravemeijer, 1994).

2. RESEARCH METHOD

2.1. Research Design

This study employed a Systematic Literature Review (SLR) approach to comprehensively synthesize empirical evidence regarding the implementation of Realistic Mathematics Education (RME) in mathematics education. The SLR methodology was selected because it enables a transparent, systematic, and protocol-driven analysis of relevant literature, thereby enhancing the validity and reliability of research findings (Kitchenham & Charters, 2007). The review protocol followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines, which emphasize transparency, methodological rigor, and replicability throughout the review process (Page et al., 2021). Accordingly, all stages of the review were designed to be auditable and reproducible by other researchers (Moher et al., 2009).

2.2. Literature Search and Selection Process

The literature search was conducted across three databases: Scopus, ERIC, and Google Scholar. A structured search strategy based on Boolean operators was employed to maximize the sensitivity and specificity of retrieval results (Xiao & Watson, 2019). The search string included: *("Realistic Mathematics Education" OR "RME") AND ("mathematics learning") AND ("problem solving" OR "mathematical literacy" OR "higher order thinking skills")*.

The publication period was restricted to studies published between 2021 and 2025 to ensure the recency and relevance of the evidence base (Snyder, 2019). In addition, backward and forward snowballing techniques were applied to identify potentially relevant studies not captured through the primary database search (Wohlin, 2014).

The study selection process followed the PRISMA 2020 framework, consisting of four stages: identification, screening, eligibility assessment, and inclusion. During the identification stage, 110 records were retrieved. After duplicate removal using a reference management tool, 85 records remained. Title and abstract screening resulted in 45 potentially relevant studies. Subsequently, full-text eligibility assessment led to the exclusion of 21 articles due to methodological limitations or insufficient alignment with the review objectives. Consequently, 24 empirical studies were included in the final synthesis (Page et al., 2021).

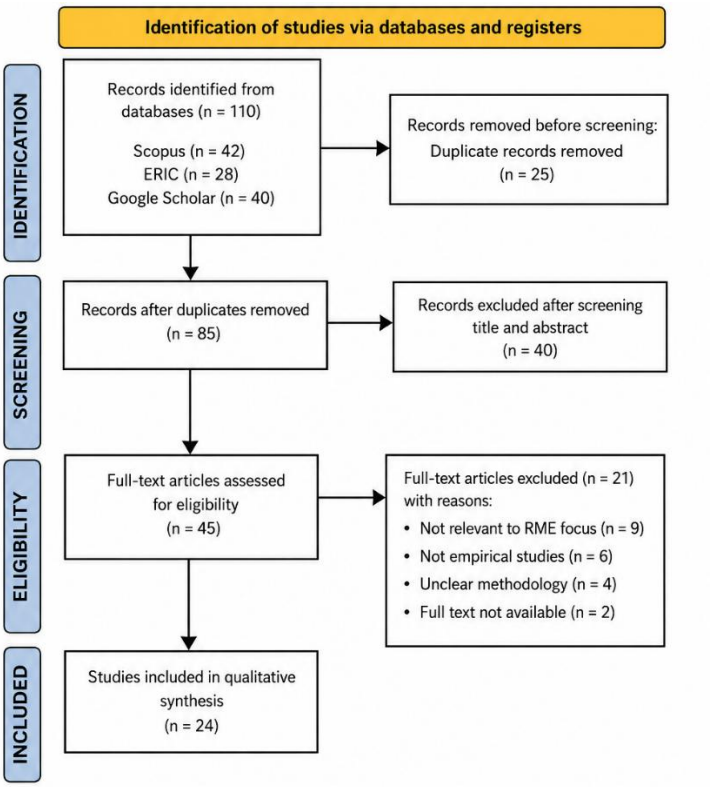

Figure 1. PRISMA 2020 Flow Diagram of the Study Selection Process (adapted from Page et al., 2021).

As illustrated in Figure 1, a total of 24 studies met all inclusion criteria and were subsequently analyzed. These studies represented diverse educational levels, research designs, and mathematical competency domains, providing a robust basis for identifying research trends and evaluating the contributions of RME in mathematics education (Page et al., 2021).

2.3. Inclusion and Exclusion Criteria

To ensure the relevance and consistency of the evidence base, the following inclusion criteria were established: (1) Empirical studies investigating the implementation of RME in mathematics education; (2) Studies employing quantitative, qualitative, or mixed-methods designs; (3) Publications indexed in Scopus, ERIC, or nationally accredited SINTA 1–3 journals; (4) Studies reporting clear and analyzable research findings; and (5) Full-text articles available in either English or Indonesian (Booth et al., 2016). These criteria were applied to enhance the validity of the synthesis and reduce irrelevant heterogeneity among studies (Petticrew & Roberts, 2006).

The exclusion criteria comprised: (1) Conceptual or theoretical papers without empirical evidence; (2) Duplicate publications; (3) Studies with unclear or unverifiable methodologies; (4) Articles discussing RME solely from a theoretical perspective without instructional implementation; and (5) Non-peer-reviewed publications, including blogs, opinion pieces, and non-scholarly reports (Kitchenham & Charters, 2007). These restrictions were intended to ensure the inclusion of high-quality evidence suitable for systematic synthesis.

2.4. Quality Assessment and Study Validity

The methodological quality of the included studies was evaluated using a checklist adapted from Kitchenham and Charters (2007). The assessment consisted of five criteria: QA1: Clarity of research objectives; QA2: Appropriateness of the methodological design; QA3: Validity and reliability of research instruments; QA4: Transparency of data analysis procedures; and QA5: Consistency between findings and conclusions.

Each criterion was scored on a three-point scale (0–2), where 0 indicated "not fulfilled," 1 indicated "partially fulfilled," and 2 indicated "fully fulfilled" (Dixon-Woods et al., 2004). The maximum quality score for each study was 10.

Based on the total score, studies were categorized as follows: High quality: 8–10 points; Moderate quality: 6–7 points; and Low quality: 0–5 points (Kitchenham & Charters, 2007; Dixon-Woods et al., 2004).

Table 2. Quality Assessment of Included Studies

No.	Study	QA1	QA2	QA3	QA4	QA5	Total Score	Quality Level
1	Paradesa et al. (2025)	2	2	2	2	2	10	High
2	Lidia et al. (2025)	2	2	2	2	2	10	High
3	Sumarna et al. (2025)	2	2	2	2	2	10	High
4	Asmaarobiyah et al. (2025)	2	2	1	2	2	9	High
5	Nurlatifah et al. (2025)	2	2	2	2	2	10	High
6	Siswanto et al. (2025)	2	2	2	2	2	10	High
7	Mufti (2024)	2	2	2	2	2	10	High
8	Amanda et al. (2025)	2	2	2	2	2	10	High
9	Risdiyanti et al. (2024)	2	2	1	2	2	9	High
10	Afsari et al. (2021)	2	2	2	2	2	10	High
11	Nurlitawati & Budiharti (2024)	2	2	1	2	2	9	High
12	Adha et al. (2023)	2	2	2	2	1	9	High
13	Muhadi et al. (2025)	2	2	2	2	2	10	High
14	Mutik et al. (2024)	2	2	2	2	1	9	High
15	Taqiya & Juandi (2023)	2	2	2	2	2	10	High
16	Febrilia et al. (2025)	2	2	1	2	2	9	High
17	Pratiwi & Meiliasari (2025)	2	2	1	2	2	9	High
18	Aningsih & Ansida (2022)	2	2	1	2	1	8	High
19	Sukasno et al. (2023)	2	2	2	1	2	9	High
20	Fitriyana et al. (2023)	2	2	1	2	1	8	High
21	Realistic Mathematics Education on HOTS (2022)	2	2	1	1	2	8	High
22	Sirait et al. (2025)	2	2	2	2	2	10	High
23	Marwiyah et al. (2025)	2	1	1	2	1	7	Moderate
24	Ridhaningtyas & Putra (2025)	2	1	1	1	1	6	Moderate

The quality assessment revealed that most of the included studies demonstrated satisfactory methodological rigor. These findings indicate that the majority of the evidence synthesized in this review met acceptable methodological standards, particularly regarding research objectives, methodological appropriateness, and consistency between findings and conclusions (Kitchenham & Charters, 2007).

Although one study was classified as low quality, it was retained in the synthesis because it provided empirically relevant evidence regarding the implementation of RME in primary education, an area that remains underrepresented in the literature. This decision is consistent with recommendations by Petticrew and Roberts (2006), who argue that lower-quality studies

may be included when they provide valuable contextual insights and do not disproportionately influence the overall synthesis.

To further enhance transparency, the distribution of study quality categories is summarized in Table 3.

Table 3. Summary of Quality Assessment Results

Quality Level	Number of Studies	Percentage (%)
High	22	91.7
Moderate	2	8.3
Low	0	0.0
Total	**24**	**100.0**

Overall, the predominance of high-quality studies suggests that the findings of this review are grounded in relatively robust and credible evidence. Consequently, the synthesized results are expected to provide a valid representation of research trends, implementation patterns, and the contributions of RME to students' mathematical competencies (Page et al., 2021).

2.5. Data Extraction and Study Characteristics

Data extraction was conducted systematically using a structured extraction form. The extracted information included authors, publication year, country, research design, educational level, mathematical competency focus (e.g., mathematical literacy, problem-solving, and higher-order thinking skills), and key findings. This procedure ensured consistency in data collection and facilitated the subsequent thematic synthesis process (Thomas & Harden, 2008).

The characteristics of all included studies are presented in Table 4, providing transparency and enabling academic auditability. The presentation of study characteristics also supports the reproducibility of the review in accordance with PRISMA recommendations (Page et al., 2021).

2.6. Data Analysis

Data were analyzed using thematic synthesis based on the framework proposed by Braun and Clarke (2006). The analysis consisted of five stages: data familiarization, open coding, theme development, theme review, and final theme definition. This approach enabled the identification of conceptual patterns across studies and facilitated the development of a deeper and more interpretive synthesis of the evidence (Braun & Clarke, 2006).

To enhance analytical reliability, the coding process was conducted systematically and documented through an audit trail. Furthermore, interpretive triangulation was applied by comparing findings across studies to minimize researcher subjectivity (Nowell et al., 2017). All analytical procedures were documented comprehensively to ensure transparency and replicability (Page et al., 2021).

2.7. Risk of Bias

This review acknowledges the potential presence of bias, particularly selection bias and publication bias. Selection bias may arise from limitations associated with database coverage and the application of strict inclusion criteria, which could result in the omission of relevant

studies (Higgins et al., 2019). Publication bias may occur because studies reporting statistically significant findings are more likely to be published than those reporting non-significant results (Sterne et al., 2011).

To mitigate these risks, multiple databases were searched, snowballing techniques were employed, and transparent inclusion criteria were applied throughout the review process. Nevertheless, these limitations remain important methodological considerations and should be taken into account when interpreting the findings of this review (Petticrew & Roberts, 2006).

3. RESULT AND DISCUSSION

3.1. Result

3.1.1. Characteristics of the Included Studies

A total of 24 studies met the inclusion criteria and were included in the final synthesis. These studies were published between 2021 and 2025 and were predominantly systematic literature reviews (SLRs). The reviewed literature addressed a wide range of topics, including mathematical literacy, conceptual understanding, mathematical problem-solving, mathematical communication, Higher Order Thinking Skills (HOTS), the implementation of Indonesian Realistic Mathematics Education (PMRI) and Realistic Mathematics Education (RME), as well as specific mathematical topics such as fractions, angles, and ratio–proportion. A summary of the characteristics of the included studies is presented in Table 4.

Table 4. Characteristics of the Included Studies

No.	Study	Article Title	Research Focus	Key Findings
1	Paradesa et al. (2025)	Systematic Literature Review: Does Realistic Mathematics Education Approach Enhance Mathematical Literacy	Mathematical literacy	RME consistently improves mathematical literacy through authentic contextual learning.
2	Lidia et al. (2025)	Systematic literature review: hubungan antara pembelajaran realistic mathematics education (rme) terhadap disposisi matematis	Mathematical disposition	RME enhances confidence, positive attitudes, and engagement in mathematics learning.
3	Sumarna et al. (2025)	Systematic Literature Review: Penerapan Realistic Mathematics Education Meningkatkan Kemampuan Komunikasi dan Pemahaman Konsep Matematis Siswa	Communication & conceptual understanding	RME strengthens mathematical communication and conceptual understanding.
4	Asmaarobiyah et al. (2025)	Pendekatan Pendidikan Matematika melalui Realistic Mathematics Education (RME) di Sekolah Dasar: Systematic Literature Review	Elementary RME implementation	RME improves multiple mathematical competencies, including critical thinking and problem solving.
5	Nurlatifah et al. (2025)	Systematic Literature Review: Penerapan Pendekatan Realistic Mathematic Education untuk Meningkatkan Kompetensi Pemecahan Masalah pada Siswa	Problem-solving skills	RME effectively enhances mathematical problem-solving abilities.
6	Siswanto et al. (2025)	Systematic Literature Review: Realistic Mathematics Education	Critical thinking	RME improves mathematical critical

		Approach for Enhancing Junior High Students' Critical Thinking Skills		thinking through contextual learning.
7	Mufti (2024)	Systematic Literature Review: Peran Pendidikan Matematika Realistik dalam Meningkatkan Kemampuan Pemahaman Konsep	Conceptual understanding	RME significantly improves students' conceptual understanding across topics.
8	Amanda et al. (2025)	Meta-Analysis: The Effect of Realistic Mathematics Education (RME) on Improving Mathematics Learning Outcomes	Learning outcomes	RME has a significant positive effect on mathematics achievement.
9	Risdiyanti et al. (2024)	Ratio and proportion through realistic mathematics education and pendidikan matematika realistik Indonesia approach: A systematic literature review	Ratio and proportion	PMRI effectively supports ratio and proportion learning while highlighting research gaps.
10	Afsari et al. (2021)	Systematic Literature Review: Efektivitas Pendekatan Pendidikan Matematika Realistik Pada Pembelajaran Matematika	Effectiveness of PMR/RME	PMR improves achievement and diverse mathematical competencies.
11	Nurlitawati & Budiharti (2024)	Studi Literatur: Penerapan Model Realistic Mathematic Education (RME) Pada Hasil Belajar Matematika Di Sekolah Dasar	Elementary mathematics achievement	RME enhances mathematics achievement through contextual and collaborative learning.
12	Adha et al. (2023)	Systematic literature review: pembelajaran sudut menggunakan pendekatan pendidikan matematika realistik	PMRI on angles	PMRI improves understanding of angle concepts and reduces misconceptions.
13	Muhadi et al. (2025)	Realistic Mathematical Approach to Improve Elementary Students' Understanding of Fraction Concepts, Mathematical Thinking, and Collaboration	Fractions, thinking & collaboration	PMR improves fraction understanding, mathematical thinking, and collaboration.
14	Mutik et al. (2024)	Numeracy Literacy Skills in the ELPSA Learning Model with the Realistic Mathematics Education Approach Viewed from Students' Mathematics Anxiety	Numeracy literacy & anxiety	ELPSA-integrated RME improves numeracy literacy while reducing mathematics anxiety.
15	Taqiya & Juandi (2023)	Students' Mathematical Literacy with Realistic Mathematics Education (RME) Approach: Systematic Literature Review	Mathematical literacy	RME positively influences mathematical literacy across educational levels.
16	Febrilia et al. (2025)	Implementation of Realistic Mathematics Education in Indonesia	RME implementation	Authentic contexts and interaction are key factors in successful RME implementation.
17	Pratiwi & Meiliasari (2025)	Systematic literature review: implementasi pendekatan pendidikan matematika realistik indonesia (pmri) dalam pembelajaran matematika di sekolah	PMRI implementation	PMRI improves understanding, achievement, motivation, and problem solving.
18	Aningsih & Ansida (2022)	Gambaran model pembelajaran realistic mathematic education terhadap kemampuan pemecahan	Elementary problem solving	RME enhances mathematical problem-solving through meaningful learning.

		masalah matematika di sekolah dasar		
19	Sukasno et al. (2023)	Systematic literature review: pembelajaran pecahan menggunakan pendekatan pendidikan matematika realistik indonesia	Fractions	PMRI improves fraction understanding using authentic contexts and learning trajectories.
20	Fitriyana et al. (2023)	Systematic Literatur Review: Efektifitas Pembelajaran Matematika Dengan Pendekatan Penddidikan Matematika Realistik Indonesia	PMRI effectiveness	PMRI improves achievement, conceptual understanding, and critical thinking.
21	Realistic Mathematics Education on HOTS of Students (2022)	Realistic mathematic education on higher-order thinking skill mathematics of student	Higher-order thinking skills	RME effectively develops students' higher-order thinking skills.
22	Sirait et al. (2025)	Efektivitas Penerapan Model Pembelajaran Realistic Mathematics Education terhadap Pemahaman Konsep untuk Meningkatkan Kemampuan Komunikasi Matematika	Conceptual understanding & communication	RME improves conceptual understanding and mathematical communication.
23	Marwiyah et al. (2025)	Systematic literature review: model pembelajaran matematika untuk meningkatkan kemampuan penalaran dan pembuktian matematik	Reasoning & proof	RME strengthens mathematical reasoning and proof abilities.
24	Ridhaningtyas & Putra (2025)	Penerapan Pendekatan Matematika Realistik terhadap Kemampuan Pemahaman Konsep Matematis Siswa	Conceptual understanding & problem solving	PMR significantly improves conceptual understanding and problem-solving skills.

3.1.2. Publication Trends in Realistic Mathematics Education (RME) Research

The synthesis results indicate that RME has a positive impact on various mathematical abilities of students. (Mufti, 2024) states that RME is effective in improving students' understanding of mathematical concepts. (Ridhaningtyas & Putra, 2025) also demonstrate a significant improvement in students' conceptual understanding. (Taqiya & Juandi, 2023) found that RME contributes to improved mathematical literacy.

In terms of problem-solving, (Nurlatifah et al., 2025) demonstrate that RME helps students understand and solve contextual problems. (Aningsih & Ansida, 2022) also confirm an improvement in problem-solving skills. (Amanda et al., 2025) show that RME has a positive impact on overall mathematics learning outcomes.

Furthermore, (Mutik et al., 2024) state that RME can enhance higher-order thinking skills. (Siswanto et al., 2025) demonstrate an improvement in students' critical thinking skills. (Marwiyah et al., 2025) also confirm an improvement in students' analytical skills.

To examine the development of research on Realistic Mathematics Education (RME), the distribution of publications was analyzed according to the publication year of the studies that satisfied the inclusion criteria. This analysis provides an overview of the evolution of RME

research in mathematics education during the 2021–2025 period. The annual publication distribution is presented in Table 5 and Figure 2.

Table 5. Annual Distribution of RME Publications (2021–2025)

Publication Year	Number of Studies (*n*)	Percentage (%)
2021	1	4.2
2022	2	8.3
2023	4	16.7
2024	4	16.7
2025	13	54.2
Total	**24**	**100.0**

To provide a clearer overview of publication trends over time, the distribution of articles by publication year is presented visually in Figure 2.

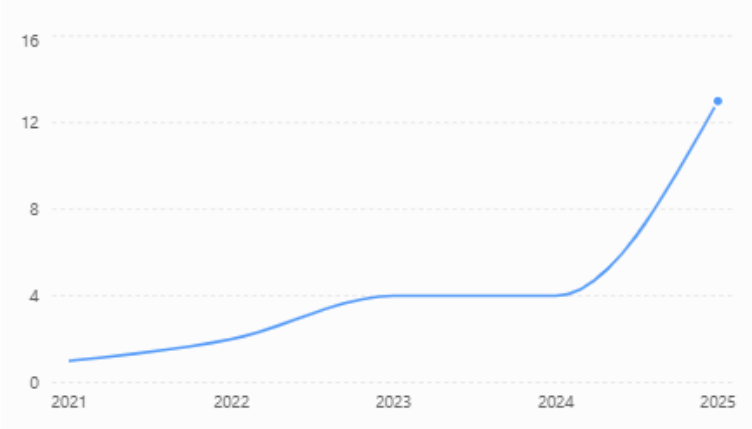

Figure 2. Publication Trends in Realistic Mathematics Education Research (2021–2025)

As presented in Table 5 and Figure 2, publications on Realistic Mathematics Education (RME) exhibited an overall upward trend during the 2021–2025 period, although the growth was not linear. Of the 24 studies included in this review, only one study (4.2%) was published in 2021, followed by two studies (8.3%) in 2022 and four studies (16.7%) in 2023. The number of publications remained stable at four studies (16.7%) in 2024 before increasing substantially to thirteen studies (54.2%) in 2025, accounting for more than half of all included studies. This pattern indicates a growing scholarly interest in the implementation of RME within mathematics education, particularly in relation to mathematical problem-solving, mathematical literacy, and the development of twenty-first-century competencies. The marked increase in publications in recent years further suggests that RME is increasingly recognized as an effective instructional approach and has emerged as a rapidly expanding area of research in mathematics education (Paradesa et al., 2025; Lidia et al., 2025). Nevertheless, the predominance of studies published in 2025 indicates that the present synthesis primarily reflects recent developments rather than long-term research trends. Therefore, the findings should be interpreted with caution, considering the uneven temporal distribution of the included studies.

The increasing publication output reflects not only growing academic interest in Realistic Mathematics Education but also broader recognition of RME as a pedagogical approach capable of addressing contemporary challenges in mathematics education. This development is consistent with the increasing emphasis on twenty-first-century learning, which prioritizes the

cultivation of critical thinking, problem-solving, mathematical communication, and mathematical literacy through contextualized, meaningful, and student-centered instructional practices (Taqiya & Juandi, 2023; Siswanto et al., 2025).

Beyond the increase in publication volume, the thematic focus of RME research has also evolved considerably. Earlier studies predominantly emphasized improvements in learning achievement and conceptual understanding, whereas more recent research has expanded its scope to investigate the contribution of RME to the development of Higher Order Thinking Skills (HOTS), mathematical literacy, mathematical communication, mathematical disposition, and the integration of digital technologies into mathematics instruction (Mutik et al., 2024; Muhadi et al., 2025).

This shift in research orientation suggests that RME has progressed from being regarded primarily as a contextual instructional approach to being recognized as a comprehensive pedagogical framework for fostering diverse mathematical competencies. Collectively, the sustained growth in publication output and the increasing diversity of research themes indicate that RME remains a strategically important and promising area for future research in mathematics education (Febrilia et al., 2025; Paradesa et al., 2025).

3.1.3. Thematic Synthesis of Research Trends in RME

The analysis of the 24 included studies revealed that the development of RME research has been characterized not only by an increase in publication output but also by a shift in thematic orientation from foundational conceptual learning toward higher-order thinking skills and the development of students' mathematical dispositions (Paradesa et al., 2025; Lidia et al., 2025). This shift suggests that RME is increasingly conceptualized as a pedagogical approach aimed not only at improving learning outcomes but also at fostering sophisticated mathematical thinking processes (Nurlatifah et al., 2025).

Furthermore, the thematic distribution of the reviewed studies indicates that research has largely concentrated on three principal domains: conceptual understanding, mathematical problem-solving, and Higher Order Thinking Skills (HOTS). This pattern reflects a consistent transition from strengthening fundamental mathematical competencies toward cultivating twenty-first-century skills, particularly critical and analytical thinking (Mutik et al., 2024; Siswanto et al., 2025). Nevertheless, the concentration of studies within specific educational contexts highlights the need for greater contextual diversity in future research to achieve a more comprehensive understanding of RME implementation (Paradesa et al., 2025).

3.1.4. Thematic Synthesis of the Impact of RME on Students' Mathematical Competencies

The thematic synthesis identified three major categories representing the impact of RME on students' mathematical competencies: (1) conceptual understanding; (2) mathematical problem-solving and mathematical literacy; and (3) Higher Order Thinking Skills (HOTS) (Mufti, 2024; Taqiya & Juandi, 2023). These domains are closely interconnected through the process of mathematization, in which mathematical concepts are progressively developed from meaningful real-world contexts (Nurlatifah et al., 2025).

Within the domain of conceptual understanding, RME facilitates knowledge construction through contextual representations that enable students to connect abstract mathematical concepts with authentic experiences (Ridhaningtyas & Putra, 2025). Regarding mathematical problem-solving, RME encourages students to employ flexible and non-routine strategies when

addressing contextual problems (Aningsih & Ansida, 2022). In terms of HOTS, the reviewed studies consistently indicate that RME promotes higher-level analytical reasoning, evaluation, and mathematical reasoning abilities (Siswanto et al., 2025; Marwiyah et al., 2025).

3.1.5. The Role of Context as a Mechanism for Mathematization

Within the RME framework, context serves as the primary mechanism that facilitates the transition from horizontal mathematization to vertical mathematization. The reviewed studies demonstrate that authentic real-world contexts function not merely as instructional illustrations but as the starting point for students' construction of mathematical concepts (Sukasno et al., 2023; Pratiwi & Meiliasari, 2025). These findings reinforce the view that mathematics learning becomes more meaningful when students actively engage with authentic situations (Fitriyana et al., 2023).

Moreover, contextual learning environments enhance both students' cognitive engagement and affective involvement by encouraging them to relate mathematical ideas to everyday experiences (Febrilia et al., 2025). Nevertheless, several studies emphasize that the effectiveness of contextual tasks depends substantially on the quality of task design and the relevance of the selected context to students' prior experiences (Mutik et al., 2024).

3.1.6. Variations in Implementation and Determinants of RME Effectiveness

The synthesis indicates that the effectiveness of RME is not uniform across educational settings but varies according to differences in implementation. The principal factors influencing successful implementation include instructional design, teachers' pedagogical competence, and students' cognitive readiness (Muhadi et al., 2025; Siswanto et al., 2025). Misalignment between RME instructional design and classroom conditions may substantially reduce the effectiveness of the learning process (Risdiyanti et al., 2024).

Furthermore, variations in educational contexts contribute to differences in research outcomes across studies. These findings suggest that RME is inherently context-dependent and that its effectiveness cannot be separated from the social, cultural, and pedagogical conditions in which it is implemented (Siswanto et al., 2025).

3.1.7. RME, Higher-Order Thinking Skills, and the Development of Mathematical Thinking

The synthesis further demonstrates that RME makes a substantial contribution to the development of Higher Order Thinking Skills (HOTS), particularly in the areas of analysis, evaluation, and reflective reasoning (Sumarna et al., 2025; Asmaarobiyah et al., 2025). These competencies are cultivated through the exploration of authentic contextual problems that require students to independently construct solution strategies (Nurlitawati & Budiharti, 2024).

In addition, RME promotes reflective and creative mathematical thinking through collaborative discussion and mathematical argumentation (Adha et al., 2023). Collectively, these findings suggest that RME should be understood as a comprehensive pedagogical framework that integrates conceptual construction, mathematical reasoning, and reflective thinking within a coherent learning cycle (Sirait et al., 2025).

3.2. Discussion

The findings of the thematic synthesis indicate that Realistic Mathematics Education (RME) serves as a pedagogical approach that integrates authentic real-world contexts into the mathematization process, thereby facilitating students' gradual transition from informal knowledge to formal mathematical understanding (Sukasno et al., 2023; Pratiwi & Meiliasari, 2025). This process is consistent with constructivist learning theory, which positions students as active agents in constructing knowledge through meaningful interactions with their learning environment (Fitriyana et al., 2023).

Nevertheless, the findings also reveal considerable variation in the effectiveness of RME, suggesting that its impact cannot be generalized across all educational settings. Several studies reported less favorable outcomes when RME implementation was not supported by systematically designed instructional activities and adequate teacher preparedness (Risdiyanti et al., 2024; Muhadi et al., 2025). These findings suggest that the effectiveness of RME is highly dependent on the quality of its implementation rather than on the instructional approach itself (Siswanto et al., 2025).

From a cognitive perspective, the reviewed studies consistently demonstrate that RME supports the integrated development of conceptual understanding, mathematical literacy, and mathematical problem-solving skills (Mufti, 2024; Taqiya & Juandi, 2023). However, several studies also indicate that improvements tend to be more pronounced in procedural competencies than in higher-order reasoning when instructional contexts lack authenticity and meaningful relevance (Mutik et al., 2024). This variation highlights the importance of critically examining the conditions under which RME produces optimal learning outcomes.

With respect to Higher Order Thinking Skills (HOTS), the synthesis indicates that RME makes a substantial contribution to the development of students' critical and analytical thinking abilities (Siswanto et al., 2025; Marwiyah et al., 2025). However, these benefits appear to depend largely on the quality of classroom interactions and the effectiveness of teacher scaffolding throughout the learning process (Asmaarobiyah et al., 2025). Accordingly, RME should not be regarded as an instructional approach that automatically enhances HOTS; rather, its success depends on the implementation of appropriate pedagogical strategies.

From a theoretical perspective, these findings provide further support for Freudenthal's theory of mathematization, in which authentic contexts serve as the starting point for the transformation of informal knowledge into formal mathematical abstraction (Sirait et al., 2025). Based on the present synthesis, a conceptual framework can be proposed in which the effectiveness of RME is shaped by the interaction among the quality of contextual tasks, instructional design, and students' readiness to learn. Together, these interrelated factors influence both students' cognitive achievement and affective development (Lidia et al., 2025).

Despite these contributions, the generalizability of the findings should be interpreted with caution. Most of the included studies were conducted within specific educational contexts and predominantly employed quasi-experimental designs, which inherently limit causal inference and external validity (Paradesa et al., 2025; Muhadi et al., 2025). Future research should therefore prioritize cross-cultural, cross-contextual, and longitudinal investigations to strengthen the external validity of the evidence regarding the effectiveness of RME across diverse educational settings.

4. CONCLUSION

4.1. Main Conclusions

Based on the systematic literature review of 24 empirical studies, this review demonstrates that Realistic Mathematics Education (RME) consistently contributes to the improvement of students' mathematical competencies, particularly in three key domains: (1) conceptual understanding, (2) mathematical problem-solving, and (3) mathematical literacy and higher-order mathematical reasoning.

The synthesis further indicates that the effectiveness of RME is determined not only by its contextual learning approach but, more importantly, by the quality of its implementation. Critical implementation factors include the selection of authentic real-world contexts, the design of progressively structured mathematical learning activities, and teachers' facilitation of the guided reinvention process. Accordingly, RME achieves its greatest effectiveness when students actively engage in both horizontal and vertical mathematization, enabling the gradual construction of formal mathematical understanding from meaningful contextual experiences.

4.2. Research Implications

4.2.1. Theoretical Implications

From a theoretical perspective, the findings reinforce the position of RME within the framework of social constructivism, emphasizing knowledge construction through authentic contextual experiences. The review further supports the view that mathematics learning should be understood not merely as the acquisition of correct answers but as a progressive process through which students develop mathematical thinking by moving from real-world situations toward formal mathematical abstraction.

4.2.2. Practical Implications

From a practical perspective, the findings suggest that mathematics teachers should: design learning activities grounded in authentic contexts that are meaningful and relevant to students' everyday experiences; facilitate instructional activities that promote mathematical discussion, reasoning, and collaborative knowledge construction; and assume the role of facilitators who guide students in discovering and formalizing mathematical concepts through structured learning experiences.

Furthermore, the successful implementation of RME requires teachers to possess adequate pedagogical competence to effectively support students' transition from contextual problem situations to formal mathematical representations.

4.3. Limitations

Several limitations should be acknowledged. First, the review was based on 24 studies retrieved from a limited number of databases, which may not fully represent the global body of literature on RME. Second, this review did not employ a meta-analytic approach and therefore was unable to provide quantitative estimates of the overall effect size associated with RME implementation. Third, the considerable methodological heterogeneity among the included studies limited the possibility of conducting direct statistical comparisons across findings.

4.4. Directions for Future Research

Future research should consider the following directions: conducting meta-analyses to quantify the overall effect size of RME across diverse educational contexts; investigating the relationships between key implementation variables—such as the quality of contextual tasks, teacher facilitation, and instructional strategies—and students' mathematical learning outcomes;

undertaking longitudinal studies to examine the long-term effects of RME on the development and sustainability of students' mathematical competencies; and expanding the scope of evidence by incorporating studies indexed in internationally recognized databases, such as Scopus and Web of Science, to provide a more comprehensive and globally representative synthesis of the literature.

REFERENCES

Adha, I., Zulkardi, Z., & Putri, R. I. I. (2023). Systematic literature review: pembelajaran sudut menggunakan model pendidikan matematika realistik. *Journal of Mathematics Science and Education*. https://doi.org/10.31540/jmse.v6i1.2640

Afsari, S., Safitri, I., Harahap, S. K., & Munthe, L. S. (2021). *Systematic Literature Review: Efektivitas Model Pendidikan Matematika Realistik Pada Pembelajaran Matematika*. *1*(3), 189–197. https://doi.org/10.51577/IJIPUBLICATION.V1I3.117

Amanda, Y., Katminingsih, Y., & Widodo, S. (2025). Meta-Analysis: The Effect of Realistic Mathematics Education (RME) on Improving Mathematics Learning Outcomes. *International Journal of Research and Review*, *12*(1), 148–155. https://doi.org/10.52403/ijrr.20250118

Aningsih, A., & Ansida, M. (2022). Gambaran model pembelajaran realistic mathematic education terhadap kemampuan pemecahan masalah matematika di sekolah dasar. *PEDAGOGIK (JURNAL PENDIDIKAN SEKOLAH DASAR)*, *10*(1), 29–38. https://doi.org/10.33558/pedagogik.v10i1.4605

Asmaarobiyah, R., Rosmilawati, I., & Juansah, D. E. (2025). Model Pendidikan Matematika melalui Realistic Mathematics Education (RME) di Sekolah Dasar: Systematic Literature Review. *Journal of Instructional and Development Researches*, *5*(3), 251–267. https://doi.org/10.53621/jider.v5i3.527

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful literature review* (2nd ed.). Sage Publications. https://doi.org/10.4135/9781473921405

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Dixon-Woods, M., Shaw, R. L., Agarwal, S., & Smith, J. A. (2004). The problem of appraising qualitative research. *Quality and Safety in Health Care, 13*(3), 223–225. https://doi.org/10.1136/qshc.2003.008714

Febrilia, Y., Saputra, J., Purnasari, P. D., & Helisman, H. (2025). Implementation of Realistic Mathematics Education in Indonesia. *Contemporary Education and Community Engagement*, *2*(2), 137–145. https://doi.org/10.12928/cece.v2i2.1439

Fitriyana, E., Zaenuri, Z., & Hidayah, I. (2023). Systematic Literatur Review: Efektifitas Pembelajaran Matematika Dengan Model Pendidikan Matematika Realistik Indonesia. *Jurnal E-DuMath*, *9*(1), 20–28. https://doi.org/10.52657/je.v9i1.1937

Freudenthal, H. (2002). *Revisiting mathematics education: China lectures*. Dordrecht: Springer Netherlands.

Gravemeijer, K. P. E. (1994). Developing realistic mathematics education.

Gravemeijer, K., & Terwel, J. (2000). Hans Freudenthal: A mathematician on didactics and curriculum theory. *Journal of Curriculum Studies, 32*(6), 777–796. https://doi.org/10.1080/00220270050167170

Higgins, J. P. T., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J., & Welch, V. A. (Eds.). (2019). *Cochrane handbook for systematic reviews of interventions* (2nd ed.). Wiley. https://doi.org/10.1002/9781119536604

Kitchenham, B. (2004). Procedures for performing systematic reviews. *Keele University Technical Report*.

Lidia, L., Rahayu, W., & Meiliasari, M. (2025). Systematic literature review: hubungan antara pembelajaran realistic mathematics education (rme) terhadap disposisi matematis. *JP2M (Jurnal Pendidikan Dan Pembelajaran Matematika)*, *11*(1), 246–259. https://doi.org/10.29100/jp2m.v11i1.7257

Marwiyah, R., Khoerunnisa, R., Maryono, I., & Rizqiyani, R. (2025). Systematic literature review: model pembelajaran matematika untuk meningkatkan kemampuan penalaran dan pembuktian matematis. *Jurnal Inovasi Pembelajaran Matematika*, *4*(2), 449–468. https://doi.org/10.31980/pme.v4i2.2972

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine, 6*(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097

Mufti, F. I. (2024). Systematic Literature Review: Peran Pendidikan Matematika Realistik dalam Meningkatkan Kemampuan Pemahaman Konsep. *Konstanta*, *2*(2), 133–141. https://doi.org/10.59581/konstanta.v2i2.3282

Muhadi, A., Wahyudin, W., & Arisetyawan, A. (2025). Realistic Mathematical Approach to Improve Elementary Students' Understanding of Fraction Concepts, Mathematical Thinking, and Collaboration. *Journal of Innovation and Research in Primary Education*, *4*(3), 1763–1775. https://doi.org/10.56916/jirpe.v4i3.1664

Mutik, R., Kartono, K., & Kharisudin, I. (2024). Numeracy Literacy Skills in the ELPSA Learning Model with the Realistic Mathematics Education Approach Viewed from Students' Mathematics Anxiety. *Indonesian Journal of Mathematics Education*, *7*(2), 71–81. https://doi.org/10.31002/ijome.v7i2.2272

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods, 16*(1), 1–13. https://doi.org/10.1177/1609406917733847

Nurlatifah, P. A., Salsabila, A., Azizah, L. N., & Nurjanah, N. (2025). Systematic Literature Review: Penerapan Model Realistic Mathematic Education untuk Meningkatkan Kompetensi Pemecahan Masalah pada Siswa. *Jurnal Jendela Matematika*, *3*(01), 66–79. https://doi.org/10.57008/jjm.v3i01.1289

Nurlitawati, D. S., & Budiharti, B. (2024). Studi Literatur: Penerapan Model Realistic Mathematic Education (RME) Pada Hasil Belajar Matematika Di Sekolah Dasar. *Elementary School Journal PGSD FIP UNIMED*, *14*(2), 206. https://doi.org/10.24114/esjpgsd.v14i2.57937

Organisation for Economic Co-operation and Development. (2023). *PISA 2022 results (Volume I): The state of learning and equity in education*. OECD Publishing. https://doi.org/10.1787/53f23881-en

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E.,

McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71. https://doi.org/10.1136/bmj.n71

Paradesa, R., Zulkardi, Z., Putri, R. I. I., & Darmawijoyo, D. (2025). Systematic Literature Review: Does Realistic Mathematics Education Approach Enhance Mathematical Literacy? *Indiktika*, *7*(2), 575–588. https://doi.org/10.31851/indiktika.v7i2.18151

Petticrew, M., & Roberts, H. (2006). *Systematic reviews in the social sciences: A practical guide*. Blackwell Publishing. https://doi.org/10.1002/9780470754887

Pratiwi, V. E., & Meiliasari, M. (2025). Systematic literature review: implementasi model pendidikan matematika realistik indonesia (pmri) dalam pembelajaran matematika di sekolah. *De Fermat*, *8*(1), 22–34. https://doi.org/10.36277/defermat.v8i1.2262

Realistic mathematic education on higher-order thinking skill mathematics of students. (2022). *7*(2), 219–236. https://doi.org/10.22236/kalamatika.vol7no2.2022pp219-236

Ridhaningtyas, L. P., & Putra, E. C. S. (2025). Penerapan Model Matematika Realistik terhadap Kemampuan Pemahaman Konsep Matematis Siswa. *Arzusin*, *5*(3), 1547–1559. https://doi.org/10.58578/arzusin.v5i3.6030

Risdiyanti, I., Zulkardi, Z., Putri, R. I. I., Prahmana, R. C. I., & Nusantara, D. S. (2024). Ratio and proportion through realistic mathematics education and pendidikan matematika realistik Indonesia approach: A systematic literature review. *Elemen: Jurnal Teknik Mesin*. https://doi.org/10.29408/jel.v10i1.24445

Sirait, A. A. K., Siahaan, A. F., Samosir, D., Rahmah, D. P., & Hasratuddin, H. (2025). Efektivitas Penerapan Model Pembelajaran Realistic Mathematics Education terhadap Pemahaman Konsep untuk Meningkatkan Kemampuan Komunikasi Matematika. *Ideguru: Jurnal Karya Ilmiah Guru*, *10*(2), 1562–1568. https://doi.org/10.51169/ideguru.v10i2.818

Siswanto, D. H., Kintoko, & Susetyawati, M. M. E. (2025). Systematic Literature Review: Realistic Mathematics Education Approach for Enhancing Junior High Students' Critical Thinking Skills. *Indo-MathEdu Intellectuals Journal*, *6*(3), 2772–2787. https://doi.org/10.54373/imeij.v6i3.2900

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research,* *104*, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Sterne, J. A. C., Sutton, A. J., Ioannidis, J. P. A., Terrin, N., Jones, D. R., Lau, J., Carpenter, J., Rücker, G., Harbord, R. M., Schmid, C. H., Tetzlaff, J., Deeks, J. J., Peters, J., Macaskill, P., Schwarzer, G., Duval, S., Altman, D. G., Moher, D., Higgins, J. P. T., & Egger, M. (2011). Recommendations for examining and interpreting funnel plot asymmetry in meta-analyses of randomised controlled trials. *BMJ,* *343*, d4002. https://doi.org/10.1136/bmj.d4002

Sukasno, S., Putri, R. I. I., & Zulkardi, Z. (2023). Systematic literature review: pembelajaran pecahan menggunakan model pendidikan matematika realistik indonesia. *Journal of Mathematics Science and Education*. https://doi.org/10.31540/jmse.v6i1.2616

Sumarna, M. S., Nindiasari, H., Pujiastuti, H., & Yuhana, Y. (2025). Systematic Literature Review: Penerapan Realistic Mathematics Education Meningkatkan Kemampuan Komunikasi dan Pemahaman Konsep Matematis Siswa. *Edukasiana: Jurnal Inovasi Pendidikan*, *4*(3), 946–956. https://doi.org/10.56916/ejip.v4i3.1606

Taqiya, F. A., & Juandi, D. (2023). Students' Mathematical Literacy with Realistic Mathematics Education (RME) Approach: Systematic Literature Review. *MEJ (Mathematics Education Journal)*, *7*(1), 60–72. https://doi.org/10.22219/mej.v7i1.24103

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology, 8*(45), 1–10. https://doi.org/10.1186/1471-2288-8-45

Treffers, A. (2012). *Three dimensions: A model of goal and theory description in mathematics instruction—The Wiskobas Project*. Springer Science & Business Media.

Wohlin, C. (2014). Guidelines for snowballing in systematic literature studies. *Proceedings of the 18th International Conference on Evaluation and Assessment in Software Engineering*. https://doi.org/10.1145/2601248.2601268

Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of Planning Education and Research*, 39(1), 93–112. https://doi.org/10.1177/0739456X17723971