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Systematic Literature Review: The Relationship between Self-Efficacy and Students' Critical Thinking Skills

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ABSTRACT. This study uses a Systematic Literature Review (SLR) technique with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology through Google Scholar and Web of Scientific Journals Publish or Perish to investigate the relationship between students' critical thinking skills and self-efficacy through a review of 24 publications published between 2018 and 2025 in various journals. Based on the analysis findings, research on critical thinking skills and self-efficacy has been conducted extensively at different levels of education, with the majority (73%) performed in junior high schools. Furthermore, 62% of quantitative research is often used, and this research predominantly develops critical thinking skills. This dominance indicates that self-efficacy is generally considered a supporting variable rather than the primary focus of the topic, thereby opening opportunities for future research on broader subjects and methods.

Keywords: critical thinking skills; self-efficacy; systematic literature review

ABSTRAK. Studi ini menggunakan teknik *Systematic Literature Review* (SLR) dengan metodologi *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) melalui Google Scholar dan Web of Scientific (WOS) Journals. Publish or Perish digunakan untuk menyelidiki hubungan antara keterampilan berpikir kritis siswa dan *self-efficacy* melalui tinjauan 24 publikasi yang diterbitkan antara tahun 2018 dan 2025 di berbagai jurnal. Berdasarkan temuan analisis, penelitian tentang keterampilan berpikir kritis dan *self-efficacy* telah dilakukan secara ekstensif di berbagai tingkat pendidikan, dengan mayoritas (73%) dilakukan di sekolah menengah pertama. Selanjutnya, 62% penelitian kuantitatif sering digunakan,dan penelitian ini didominasi untuk mengembangkan keterampilan berpikir kritis. Dominasi ini menunjukkan bahwa *self-efficacy* umumnya dianggap sebagai variabel pendukung daripada fokus utama topik, sehingga membuka peluang untuk penelitian di masa depan tentang subjek dan metode yang lebih luas.

Kata kunci: keterampilan berpikir kritis; *self-efficacy; systematic literature review*

INTRODUCTION

In this era of globalization, all students are expected to be able to compete with rapid change. Therefore, 21st-century education must be oriented towards providing students with relevant skills (Rahayu et al., 2021). Critical thinking is a key skill that students must possess to succeed in the 21st century (Putri et al., 2022). Critical thinking is essential in the 21st century, especially in mathematics learning, because this skill is applicable and must be based on logical reasoning.

Critical thinking is the ability of each individual to reason to gain a deeper understanding (Nurjanah et al., 2020). Critical thinking enables one to analyze, interpret, evaluate, and synthesize diverse information (Faiziyah, 2022). Critical thinking is an essential skill in mathematics learning because it enables students to understand concepts comprehensively and in an organized manner, rather than simply performing mechanical calculations (Butedafrilia & Granita, 2024).

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Critical thinking plays a crucial role in encouraging students to reason when facing problems. Students with strong critical thinking skills typically make fewer errors when solving problems and learn more easily because they analyze and evaluate the information they receive (Erlita & Hakim, 2022). In the context of mathematics, critical thinking helps students construct logical reasoning, solve complex problems, and connect mathematical concepts to real-world situations (Rahmaini & Chandra, 2024). Mathematics learning will not focus solely on calculations if students can develop these critical thinking skills(Khusna & Ulfah, 2021), so they will also be able to solve more complex, real-world story problems (Salsabila, Imelda, Nurmalia, & Rakhmawati, 2024).

Facione (Prajono, Gunarti, & Anggo, 2022) states that the foundations of critical thinking are analysis, interpretation, explanation, evaluation, and self-confidence. These five foundations imply that, in developing critical thinking skills, students need a key component to avoid anxiety: self-confidence in their own abilities, or self-efficacy (Melyana & Pujiastuti, 2020). As stated by Bandura, self-efficacy is the belief and confidence in one's own abilities to carry out something to achieve desired goals (Prajono et al., 2022). According to Septhiani (2022), self-efficacy in the educational realm plays a crucial role in helping students better face and solve problems. This self-confidence is important for students to achieve learning success because it influences how students feel, think, and act (Susantiet al., 2022).

Furthermore, strong self-confidence is a key asset for students in practical critical thinking. With high self-efficacy, students do not give up easily when facing learning challenges, but are instead encouraged to try various approaches to solving problems. This statement aligns with Facione's emphasis that critical thinking is not merely a cognitive ability but also encompasses self-regulation and a reflective attitude, enabling individuals to manage their emotions in decision-making (Geovani & Waluya, 2025). Therefore, the development of strong self-efficacy, along with critical thinking skills, will produce students who are not only adept at analyzing and evaluating information but also confident in expressing and defending their decisions and solutions (Prajono et al., 2022).

Research on critical thinking skills and self-efficacy in mathematics learning has been conducted, including a study of MTs (junior high school equivalent) students (Kaustsari et al., 2024). The results showed that students' critical thinking skills differed significantly at high, medium, and low levels of self-efficacy. However, there remains a research gap regarding how these research trends will develop, particularly between 2018 and 2025. Furthermore, there is little research on which educational levels are most frequently studied, which research methods are most commonly used, and how many citations are received from relevant research articles.

Therefore, this study aims to systematically identify the findings of several studies conducted between 2018 and 2025 regarding the relationship between self-efficacy and students' critical thinking skills in mathematics learning. Furthermore, this study aims to determine which educational levels are most frequently studied, the types of research most frequently used in relevant research, and the number of relevant articles used as references or cited. By reviewing the published literature, this study can provide an in-depth overview of research on the relationship between self-efficacy and students' critical thinking skills. Furthermore, the results of this SLR can serve as a reference in designing learning strategies to improve both aspects of learning, particularly in mathematics.

METHOD

The researchers used a Systematic Literature Review (SRB) method in this study, which follows the procedures outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Ridho & Dasari, 2023). This procedure aims to assess, review, and interpret all data from the research findings (Siswanto & Meiliasari, 2024). PRISMA is a

systematic and transparent process for selecting and filtering literature relevant to the research objectives (Nisa et al., 2025). The following is the PRISMA flow.

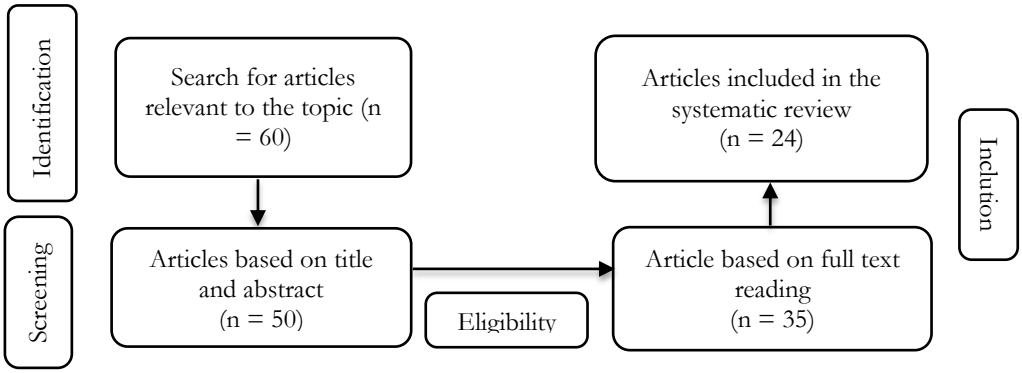

Figure 1. PRISMA Flow

An explanation of each PRISMA stage in this study: identification, screening, eligibility, and inclusion. The first stage, identification, involved searching for relevant Indonesian-language articles on critical thinking and self-efficacy using keywords relevant to the topic, across scientific databases such as Google Scholar and Web Journal Scient Publish or Perish, from 2018 to 2025.

The search results during this period yielded 60 articles, including journal articles and conference proceedings, that were relevant to the research topic. In the second stage, the researcher screened the articles based on their titles and abstracts. Of the 60 articles, the researcher selected 50 articles through screening. The third stage, eligibility, is the stage of in-depth evaluation of the selected articles to ensure they meet the established eligibility criteria by reading the entire text of the article, such as (1) the article specifically discusses the relationship between self-efficacy and mathematical critical thinking skills; (2) the article clearly states the subject, research method, and results. After adjustments at this stage, the researcher selected 35 relevant articles. The final stage, inclusion, is the stage of determining which articles will be used in the systematic review based on the results of the eligibility assessment. The researcher selected 24 articles for further analysis regarding the year of publication, the level of research subjects, the research design used, the competencies developed, and the frequency of article references. The final results are as follows.

RESULTS AND DISCUSSION

This study aims to analyze the relationship between self-efficacy and students' mathematical critical thinking skills, and to identify the number of articles per year, educational level, the most frequently used methods, the competencies developed, and the most cited articles. Based on the results of the PRISMA approach literature review, conducted by researchers using Google Scholar and the Publish or Perish search engine, 24 articles have been published between 2018 and 2025. The following is a discussion of this study.

Table 1. Article Conclusion

No	Research Title	Authors	Conclusion
1	"Analysis of Junior High School Students' Mathematical Critical Thinking Skills in Terms of Self-Efficacy"	Prajono, Gunarti, & Anggo (2022)	There is a relationship between mathematical critical thinking skills and students' self-efficacy.
2	"Analysis of the Relationship between Self-Efficacy and Students' Mathematical Critical Thinking Skills on Circles"	Nurazizah & Nurjaman (2018)	There is a relatively significant relationship between self-efficacy and critical thinking skills. The higher the self-confidence, the higher the critical thinking skills.

No	Research Title	Authors	Conclusion
3	"The influence of self-confidence on the mathematical critical thinking skills of junior high school students"	Melyana & Pujiastuti (2020)	Self-confidence has a positive influence of 57.3% on students' critical thinking skills.
4	"The Relationship Between Self-Efficacy and Students' Critical Thinking Skills in Mathematics"	Agus (2021)	There is a correlation (0.62) between self-efficacy and critical thinking skills, meaning that if a student's self-efficacy is high, their critical thinking skills will also be higher.
5	"The Influence of Self-Efficacy on the Critical Mathematical Thinking Skills of Junior High School Students"	Hari, Zanthy, & Hendriana (2022)	Students' critical mathematical thinking ability is positively influenced by self-efficacy by 56.4%.
6	"The Influence of Self-Confidence and Learning Motivation on Critical Thinking Skills in Elementary School Students"	Ambarwati, Suhartono, & Nurhasanag (2021)	25% self-confidence influences students' critical thinking skills.
7	"The Relationship Between Self-Efficacy and Critical Mathematical Thinking Skills of Vocational High School Students on Arithmetic Series and Sequences"	Misbahudin (2019)	There is a significant relationship with an influence of 19.89% between self-efficacy and students' critical thinking abilities.
8	"The Influence of Self-Efficacy on Students' Critical Thinking Skills in Mathematics"	Sukma & Priatna (2021)	Self-efficacy significantly influences students' critical thinking skills (CTS) in mathematics subjects.
9	"The Influence of Mathematical Anxiety and Self-Efficacy on Mathematical Critical Thinking Ability in Comparative Value Material"	Pratiwi, Rukmigarsari, & Zauri (2025)	Self-efficacy positively influences critical thinking skills, with a 20.6% effect size.
10	"The Effect of the JUCAMA Learning Model on Critical Mathematical Thinking Skills in Terms of Self-Efficacy of Junior High School Students"	Utari, Destiniar, & Syahbana (2020)	A significant difference in students' critical thinking abilities was found based on their self-efficacy levels (high, medium, low), namely, $0.029 < 0.05$.
11	"The Influence of Self-Efficacy and Learning Motivation on Students' Mathematical Critical Thinking Skills"	Pratama (2023)	There is a partial effect of self-efficacy on mathematical critical thinking, with a magnitude of 16%.
12	"Analysis of Junior High School Students' Mathematical Critical Thinking Skills in Terms of Self-Efficacy in Comparative Material"	Aziz, Puspita, & Inayah (2023)	There is a relationship between mathematical critical thinking skills and self-efficacy, such that students with high self-efficacy meet all critical thinking indicators.
13	"Analysis of Mathematical Critical Thinking Skills and Self-Efficacy in Mathematics Learning"	Kaustsari, Anggoro, % Dewi (2024)	In solving mathematical problems, students with high self-efficacy have greater confidence than those with medium and low self-efficacy.
14	"Mathematics anxiety and self-confidence are related to the mathematical critical thinking abilities of high school students"	Hanifah & Miatun (2024)	Their self-confidence accounts for 12.5% of students' critical mathematical thinking.
15	"Analysis of Critical Thinking Skills in the Light of Students' Self-	Ningsih, Wulandari, & Ilmi (2023)	Students with high self-efficacy can meet all indicators of critical thinking

No	Research Title	Authors	Conclusion
	Efficacy in Quadrilaterals in Grade VII of Mts Nurul Huda Malang"		ability. Meanwhile, students with medium and low self-efficacy only meet 3 and 2 indicators, respectively.
16	"The Influence of Self-Efficacy on Students' Critical Thinking Skills"	Geovani & Waluya (2025)	The level of self-efficacy (high, medium, or low) significantly influences students' critical thinking skills.
17	"The Influence of the Problem-Based Learning Model Assisted by Student Worksheets on Mathematical Critical Thinking Skills in Terms of Self-Efficacy in Grade VIII Students"	Adawiyah, 'Adna, & Hendrastuti (2023)	Based on the results of the two-way ANOVA test, self-efficacy significantly influences mathematical critical thinking skills.
18	"The Influence of Learning Motivation and Self-Confidence on Mathematical Critical Thinking Skills Through Self-Efficacy Grade VII Students of Ma'arif 02 Islamic Junior High School, Malang City, 2023/2024 Academic Year"	Afida, Ettie, & Firda (2024)	Self-confidence has a 0.379 effect on students' critical thinking skills.
19	"The Influence of Self-Efficacy and Habits of Mind on Students' Critical Thinking Skills"	Ulfa, Rini, Sofia, Amanda, Muhammad, Anggori, & Pratiwi (2025)	Self-efficacy and Habits of Mind contribute a 65.6% positive influence on students' critical thinking skills.
20	"The Influence of Self-Efficacy, Growth Mindset, and Grit Through Students' Critical Thinking Skills in Mathematics Learning"	Rohim, Fatih, Feriyanto, Subanji, & Sudirman (2025)	Self-efficacy makes a significant and positive contribution to students' critical thinking skills.
21	A Study of Students' Mathematical Critical Thinking Skills in Islamic Junior High Schools (MTs) on the Pythagorean Theorem Based on Self-Efficacy"	Wardani, Fathani, Ismi, & Ilmi (2025)	Students with high self-efficacy tend to have strong critical thinking skills, such as understanding problems, thinking logically, drawing conclusions, and evaluating.
22	"Mathematical Critical Thinking Skills Reviewed from Student Self-Efficacy in Challenge-Based Learning (CBL) Using GeoGebra Software"	Najizah & Sutarto (2025)	Students with high self-efficacy can meet all indicators of critical thinking skills, including clarification, assessment, strategy, and inference.
23	"The Effect of the ICARE Model Implementation on Critical Thinking Skills Reviewed from the Self-Efficacy of High School Students"	Sari (2025)	Implementing ICARE can improve students' critical thinking skills by accounting for their self-efficacy levels.
24	"The Effect of Self-Efficacy, Learning Interest, and Mathematics Anxiety through Elementary School Students' Mathematical Critical Thinking Skills"	Nugraheni & Pramugita (2025)	Self-efficacy, interest in learning, and math anxiety contribute positively to mathematical critical thinking skills by 21.9%.

Based on the articles' conclusions, there is a strong relationship between self-efficacy and students' mathematical critical thinking skills across educational levels. The higher the students' self-confidence, the better their critical thinking skills in solving mathematical problems. Quantitative research conducted by Hari, Zanthy, & Hendrina (2022) and reviewed in a recent literature study revealed that self-efficacy has a positive influence of 56.4% on junior high school students' mathematical critical thinking skills. This study used a correlational design and found that higher self-efficacy was associated with better students' ability to interpret and solve mathematical problems.

Another study by Raharjo et al. (2025) also confirmed that self-efficacy significantly influences students' critical thinking skills in solving HOTS (Higher Order Thinking Skills) problems on arithmetic sequences and series, demonstrating the importance of strengthening self-efficacy in the mathematics learning process to improve critical thinking skills. Thus, educational interventions that emphasise strengthening self-efficacy have been proven effective in significantly improving students' critical thinking skills in mathematics. This conclusion confirms that self-efficacy is an important psychological factor that strongly influences mathematical critical thinking skills. Therefore, developing learning strategies that improve students' self-efficacy is highly recommended to support optimal mathematics learning outcomes.

The first discussion, regarding the number of articles per year, is presented in Figure 1 below. The data illustrate research trends regarding students' mathematical self-efficacy and critical thinking skills from 2018 to 2025.

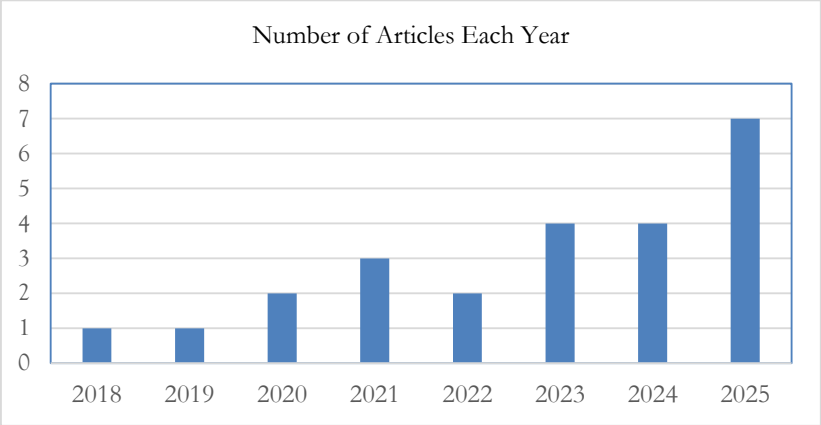

Figure 2. Trend Graph of the Relationship between Self-Efficacy and Critical Thinking Skills

The trend graph in Figure 2 shows that the number of articles examining the relationship between self-efficacy and critical thinking skills has increased year by year. In 2018 and 2019, researchers published only one article each year. The number of publications then increased to two and three articles in 2020 and 2021, respectively. In 2022, the number of articles decreased again to two. This trend indicates that researchers are paying increasing attention to this topic over time.

From 2023 to 2025, the graph shows that researchers consistently increased their publication output. In 2023 and 2024, researchers produced four articles each year. In 2025, the number of publications jumped to 7, making it the year with the most contributions. This increase indicates that researchers are increasingly prioritising the relationship between self-efficacy and critical thinking skills in their studies. Overall, the data demonstrates that research on this topic has grown rapidly over the past five years.

The graph shows that research on self-efficacy and critical thinking skills has experienced increasingly strong development over the years. Researchers continue to expand the scope of their studies in line with the increasing number of publications addressing both topics. This growth indicates that these issues have a strategic position in contemporary educational studies. The data indicate that academics increasingly understand the importance of the relationship between self-efficacy and critical thinking skills in supporting student development. Therefore, the graph reflects the significant potential for further research in this area in the coming years.

Research on self-efficacy and critical thinking skills is increasing steadily and offers promising prospects. These data indicate that both concepts will remain an important focus, especially given their close relationship to the demands of 21st-century competencies. This situation confirms that developing self-efficacy and critical thinking skills is not only relevant to

the academic world but also essential to learning practices that prepare students to face global challenges. These findings open the door to more in-depth research into practical strategies to strengthen self-efficacy and improve critical thinking skills. Thus, the results of this study can provide a strong foundation for designing more targeted and impactful learning interventions.

Second, regarding the educational levels in the related research, various stages of schooling are represented across the reviewed studies. Several levels of education are included, including elementary school, middle school, high school, vocational school, and university. Figure 2 below illustrates the distribution of educational levels examined in the related articles. The inclusion of these diverse levels shows that researchers explore the topic across multiple age groups and learning contexts. This variation also indicates that the phenomenon under study is considered relevant and applicable throughout different phases of formal education.

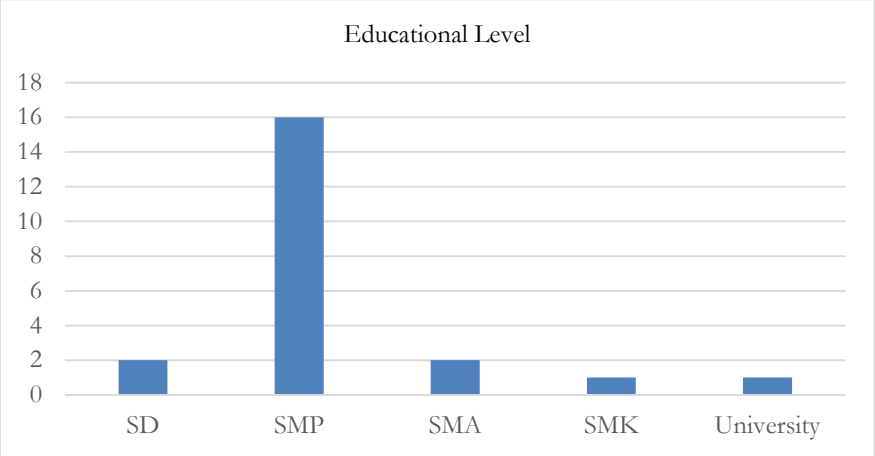

Figure 3. Graph of the Most Frequently Studied Education Levels

The figure shows that the most frequently studied educational level is Junior High School (SMP), with 16 studies, followed by Elementary School (SD) and Senior High School (SMA), with two studies each, and Vocational High School (SMK) and University, with 1 study each. The dominance of SMP as a research subject stems from its role as a crucial phase of cognitive and emotional development, where critical thinking skills and self-efficacy develop rapidly. Furthermore, the diversity of educational levels in relevant research demonstrates the importance of critical thinking skills and self-confidence for all groups, especially students. Critical thinking skills are not only needed by elementary and junior high school students, but are also crucial for sustainable development through higher education and non-formal education.

The third objective of this study was to identify the dominant research types. Figure 4 illustrates the types of research commonly used in articles on relevant topics.

Based on the graph (Figure 4), which includes 24 studies, quantitative research methods such as correlation and experiments were used more frequently, with 15 studies. This data indicates that quantitative methods are more frequently used in studies of the relationship between students' critical thinking skills and self-efficacy because they are considered capable of producing objective, measurable, and generalizable data. This method facilitates hypothesis testing and the measurement of relationships among variables using standardized instruments, thereby enabling researchers to conduct valid and reliable statistical analyses.

Qualitative studies followed, with five studies. While the literature on mixed methods remains limited, emerging research is developing this methodology and enriching the diversity of research types. Developing these diverse methodologies will foster deeper understanding and innovative learning strategies that can optimally enhance students' critical thinking skills and self-efficacy.

Fourth, regarding the competencies developed. Students' critical thinking skills dominate the competencies developed in the 24 relevant journals. The numerous links between self-efficacy and

these competencies demonstrate the crucial role of self-efficacy in developing critical thinking skills, especially in facing the challenges of today's learning world. In an era marked by high academic pressure and strong digital social influence, students will increasingly face complex problems. Therefore, they are required to continuously develop critical thinking skills to sort information, analyse data accuracy, and make decisions about future steps.

High self-efficacy can empower students to face cognitive challenges with greater confidence, potentially enhancing their critical thinking skills. Consistent with Sodik's (2024) view, this claim suggests that students' self-efficacy significantly predicts their critical thinking skills. This statement suggests that student achievement, particularly in mathematics, is significantly influenced by self-efficacy.

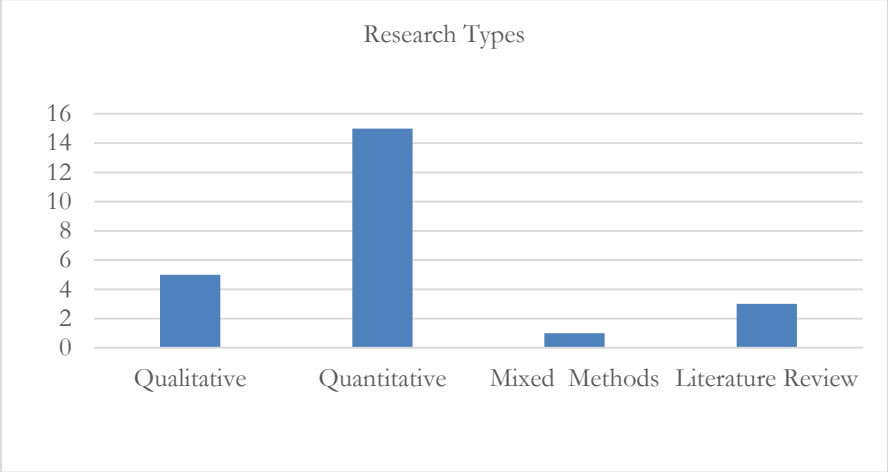

Figure 4. Graph of Dominant Research Types

The ultimate goal of this study was to identify the most cited articles. The following is a description of the relevant articles with the most citations, as presented in Table 2.

Table 2. Articles with the Most Citations

No	Research Title	Authors	Number of Citations
1	"Analysis of Junior High School Students' Mathematical Critical Thinking Skills in Terms of Self-Efficacy"	Prajono, Gunarti, & Anggo (2022)	96
2	"Analysis of the Relationship between Self-Efficacy and Students' Mathematical Critical Thinking Skills on Circles"	Nurazizah & Nurjaman (2018)	71
3	"The influence of self-confidence on the mathematical critical thinking skills of junior high school students"	Melyana & Pujiastuti (2020)	53
4	"The Relationship Between Self-Efficacy and Students' Critical Thinking Skills in Mathematics"	Agus (2021)	49
5	"The Influence of Self-Efficacy on the Critical Mathematical Thinking Skills of Junior High School Students"	Hari, Zanthy, & Hendriana (2022)	49

No	Research Title	Authors	Number of Citations
6	"The Influence of Self-Confidence and Learning Motivation on Critical Thinking Skills in Elementary School Students"	Ambarwati, Suhartono, & Nurhasanag (2021)	28
7	"The Relationship Between Self-Efficacy and Critical Mathematical Thinking Skills of Vocational High School Students on Arithmetic Series and Sequences"	Misbahudin (2019)	23
8	"The Influence of Self-Efficacy on Students' Critical Thinking Skills in Mathematics"	Sukma & Priatna (2021)	23
9	"The Influence of Mathematical Anxiety and Self-Efficacy on Mathematical Critical Thinking Ability in Comparative Value Material"	Pratiwi, Rukmigarsari, & Zauri (2025)	21
10	"The Effect of the JUCAMA Learning Model on Critical Mathematical Thinking Skills in Terms of Self-Efficacy of Junior High School Students"	Utari, Destiniar, & Syahbana (2020)	11
11	"The Influence of Self-Efficacy and Learning Motivation on Students' Mathematical Critical Thinking Skills"	Pratama (2023)	9
12	"Analysis of Junior High School Students' Mathematical Critical Thinking Skills in Terms of Self-Efficacy in Comparative Material"	Aziz, Puspita, & Inayah (2023)	7
13	"Analysis of Mathematical Critical Thinking Skills and Self-Efficacy in Mathematics Learning"	Kaustsari, Anggoro, % Dewi (2024)	4
14	"Mathematics anxiety and self-confidence are related to the mathematical critical thinking abilities of high school students"	Hanifah & Miatun (2024)	3
15	"Analysis of Critical Thinking Skills in the Light of Students' Self-Efficacy in Quadrilaterals in Grade VII of Mts Nurul Huda Malang"	Ningsih, Wulandari, & Ilmi (2023)	2
16	"The Influence of Self-Efficacy on Students' Critical Thinking Skills"	Geovani & Waluya (2025)	2
17	"The Influence of the Problem-Based Learning Model Assisted by Student Worksheets on Mathematical Critical Thinking Skills in Terms of Self-Efficacy in Grade VIII Students"	Adawiyah, 'Adna, & Hendrastuti (2023)	1
18	"The Influence of Learning Motivation and Self-Confidence on Mathematical Critical Thinking Skills Through Self-Efficacy Grade VII Students of Ma'arif 02 Islamic Junior High School, Malang City, 2023/2024 Academic Year"	Afida, Ettie, & Firda (2024)	1
19	"The Influence of Self-Efficacy and	Ulfa, Rini, Sofia, Amanda, Muhammad,	1

No	Research Title	Authors	Number of Citations
	Habits of Mind on Students' Critical Thinking Skills"	Anggori, & Pratiwi (2025)	
20	"The Influence of Self-Efficacy, Growth Mindset, and Grit Through Students' Critical Thinking Skills in Mathematics Learning"	Rohim, Fatih, Feriyanto, Subanji, & Sudirman (2025)	1
21	A Study of Students' Mathematical Critical Thinking Skills in Islamic Junior High Schools (MTs) on the Pythagorean Theorem Based on Self-Efficacy"	Wardani, Fathani, Ismi, & Ilmi (2025)	1
22	"Mathematical Critical Thinking Skills Reviewed from Student Self-Efficacy in Challenge-Based Learning (CBL) Using GeoGebra Software"	Najizah & Sutarto (2025)	1
23	"The Effect of the ICARE Model Implementation on Critical Thinking Skills Reviewed from the Self-Efficacy of High School Students"	Sari (2025)	1
24	"The Effect of Self-Efficacy, Learning Interest, and Mathematics Anxiety through Elementary School Students' Mathematical Critical Thinking Skills"	Nugraheni & Pramugita (2025)	1

Table 2 above presents several relevant research titles, including the authors' names, years, and numbers of citations. Due to its relevance to current educational issues, the research article by Prajono et al. (2022) was the most cited, with 96 citations. Furthermore, research by Nurazizah & Nurjaman (2018) also demonstrated the significant influence of self-efficacy, with 71 citations, further indicating the significant relevance of this topic in mathematics education.

Other frequently cited studies include Melyana & Pujiastuti (2020) with 53 citations, and Agus's study, "The Relationship Between Self-Efficacy and Students' Critical Thinking Skills in Mathematics," with 49 citations. Another article by Hari et al. (2022) also presented research findings with 49 citations, corroborating previous findings that self-efficacy levels are significantly related to students' critical thinking skills across educational levels.

Other research findings also demonstrate the influence of other variables interacting with self-efficacy, such as learning motivation, for example, by Ambarwati et al. (2021), with 28 citations; habits of mind, as well as mathematics anxiety and learning interest, for example, by Pratiwi et al. (2025); and by Nugraheni & Pramugita (2025). Although some of the most recent studies from 2024–2025 received only 1–4 citations, they remain important additional references on learning innovations, such as the Problem-Based Learning model, ICARE, and software-based Challenge-Based Learning.

Overall, these data indicate that research on self-efficacy and mathematical critical thinking skills has progressed quite rapidly, with several key articles serving as important references. The limited citations in recent research indicate that the current literature has not been widely developed or disseminated. This limitation presents a significant opportunity for further research to fill gaps in the current literature and develop more innovative pedagogical theories and practices.

CONCLUSION

Except for 2021 and 2022, there was a significant increase, according to the literature review. Students' critical thinking skills have developed rapidly, and self-efficacy has a significant influence on this development, especially at the junior high school level. The dominant research

type is quantitative, accounting for 15 of the 24 findings, with critical thinking as the highest competency. The most cited study is by Prajono et al. (96 citations). Therefore, further experimental research on relevant topics is needed, involving a wider sample and using mixed methods to examine in depth how and why self-efficacy influences students' critical thinking processes.

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