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The relationship between critical thinking and problem-solving skills in social studies among primary school students

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Abstract

Critical thinking skills contribute to the development of problem-solving skills. Therefore, when students use problem-solving skills, they are also using their critical thinking skills. This study aims to analyze the relationship between critical thinking skills and problem-solving skills of primary students. The study used a quantitative, correlational approach and involved 81 students from four primary schools in Cilacap. The research instrument consisted of a critical thinking test based on Facione's indicators, covering interpretation, analysis, evaluation, inference, and explanation, and a problem-solving questionnaire based on Polya's four steps. The four steps consist of understanding the problem, planning a solution, implementing a strategy, and evaluating the results. Data were analyzed using Spearman's rank correlation because neither variable was normally distributed. The results reveal that critical thinking skills and problem-solving skills were in the good category. The Spearman correlation test yielded a coefficient of 0.914 and a significance level of 0.000, indicating a very strong, unidirectional relationship between the two variables. This finding confirms that improving critical thinking skills aligns with improving problem-solving skills, especially in the context of Social Studies, which demands analysis of social issues, logical reasoning, and evidence-based decision-making. The research results are expected to serve as a basis for teachers and schools in designing learning that is more reflective, contextual, and oriented towards strengthening students' critical thinking skills.

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1. Introduction

At the primary school level, Social Studies holds a significant pedagogical function in fostering students' critical thinking, as the subject is closely connected to real social, economic, and cultural contexts encountered in everyday life. Brookhart (2010) argues that higher-order thinking skills are unlikely to develop unless learning activities actively engage students in evaluating ideas, constructing arguments, and linking theoretical knowledge with authentic situations. Despite this potential, Social Studies instruction in numerous primary schools continues to rely on traditional, teacher-dominated approaches that limit students' opportunities to actively engage in reasoning and problem-solving (Yatri, Boeriswati, & Bintoro, 2023).

Such instructional conditions contribute to the limited development of students' critical thinking and problem-solving capacities. Within the scope of primary education, critical thinking occupies a central position as it underpins students' capacity to make rational judgments grounded in evidence. Facione (2023) conceptualizes critical thinking as an organized cognitive process that involves interpreting information, conducting analysis, evaluating evidence, and formulating reasoned conclusions. Through the cultivation of this skill, learners are not merely engaged in memorizing factual information, but are encouraged to comprehend underlying meanings, recognize interrelationships, and reflect on the broader implications of the phenomena they experience. Critical thinking skills can be developed in students through a complex process. This ability is not only crucial in learning but also plays a role in every decision made in daily life, especially in today's digital era, where everyone can access information quickly. Therefore, critical thinking skills help students filter information selectively and accurately; hence, the processed information can be accounted for when shared with others. (Wulandari et al., 2026).

Critical thinking and problem-solving skills are essential skills for students to develop. Strong critical thinking and problem-solving skills will help them recognize and interpret situations and problems in learning and everyday life, enabling them to make informed decisions. Critical thinking facilitates independent learning. Students who lack the opportunity to develop these skills will struggle to navigate social and academic situations. These two skills are essential for every student, especially as they enter college and the workplace. Critical thinking plays a key role in problem-solving, enabling one to analyze and determine strategies for solving problems. Mastering these skills enables students to think quickly and effectively when addressing problems. (Tanty et al., 2022). Furthermore, Sholihah & Lastariwati (2020) explained that critical thinking skills are essential for problem-solving. Through critical thinking, students not only know the answers to problems but can also provide explanations and elaborate on the "why" and "how" questions.

Empirical evidence reported by Sasmita, Sapriya, & Maryani (2022) indicates that several primary students have difficulty articulating causal relationships in social phenomena and tend to rely on descriptive responses rather than logical reasoning. Complementary findings by Maksum, Widiana, & Marini (2021) further demonstrate a strong association between critical thinking and problem-solving skills, suggesting that students with more advanced critical thinking skills are better equipped to identify the essential aspects of a problem, assess alternative courses of action, and make reasoned decisions through logical evaluation.

Research by Qondias, Lasmawan, Dantes, and Aryana (2022) demonstrates that the application of multicultural-based Problem-based Learning is effective in improving primary students' critical thinking skills and social attitudes, as it provides space to explore social issues from various perspectives. This is in line with the findings of Darmawati and Mustadi (2023), which reveal that the problem-based learning model can improve primary students' critical

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thinking skills through investigative, collaborative, and reflective activities. Meanwhile, Amrina (2024) found a positive relationship between critical thinking skills, creativity, and problem-solving in context-based learning in primary schools.

The urgency of this research is increasingly relevant in the context of implementing the Independent Curriculum, which places critical thinking and problem-solving skills at the core of the "critical reasoning" dimension. Social Studies is an ideal vehicle for developing these two skills because it inherently demands analysis of social issues, moral decision-making, and reflection on human values (Tunkler & Akman, 2023). However, empirical studies that specifically examine the relationship between critical thinking skills and problem-solving in the context of Social Studies learning in primary schools, particularly among grade VI students, remain limited in Indonesia.

Accordingly, this study seeks to examine the relationship between critical thinking and problem-solving skills in Social Studies among sixth-grade primary students. A quantitative correlational design is employed to determine both the magnitude and direction of the relationship between these variables. Based on a theoretical perspective, the findings are expected to contribute to the body of knowledge on the development of higher-order thinking skills in basic education. Practically, the results may provide meaningful insights for teachers designing social studies instruction that is reflective, contextually grounded, and oriented toward fostering students' critical reasoning to address social issues. In this regard, social studies extend beyond content transmission, serving as a learning space to cultivate analytical, empathetic, and solution-oriented perspectives on real-life social problems.

2. Literature review

2.1 Critical thinking concepts in primary school learning

Critical thinking has been widely acknowledged as a core competency in contemporary education, particularly in addressing the demands of the twenty-first century (Brookhart, 2010; Facione, 2023; Encabo Fernández et al., 2023; Kirk et al., 2023). Through a Delphi consensus process involving experts from diverse academic backgrounds, Facione (1990, 2015) described critical thinking as a structured cognitive activity encompassing several interrelated mental processes, including interpreting information, conducting analysis, evaluating evidence, drawing inferences, articulating explanations, and regulating one's own thinking. This conceptual framework has subsequently served as a foundational reference for the development and validation of critical thinking assessment instruments across multiple educational levels, including primary education (Alpizar et al., 2022; Sasmita et al., 2022; Yatri et al., 2023).

In the primary school context, the development of critical thinking skills should begin early, as it is foundational to lifelong learning (Brookhart, 2010; Encabo Fernández et al., 2023; Shadowens, 2023). Encabo Fernández et al. (2023) found that primary students who received critical-thinking-based learning interventions showed significant improvements in evaluation and analysis skills compared with the control group. This research involved 1,272 primary school students in Murcia, Spain, and used an instrument adapted from Facione's framework to measure critical thinking skill in accordance with the cognitive development characteristics of primary school-age children (Encabo Fernández et al., 2023; Albarracín Vivo et al., 2024). Similar findings were reported by Alpizar et al. (2022), who provide empirical evidence that critical thinking skills among junior high school students can develop significantly through immersive science learning, with improvements especially in the analysis and evaluation of scientific arguments.

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In the Indonesian context, Sasmita, Sapriya, & Maryani (2022) reported that numerous primary students have difficulty explaining causal relationships in social phenomena and tend to show limited ability to present logical arguments. Their qualitative study, which employed classroom observations and interviews in primary schools in Bandung, revealed that conventional approaches to social studies instruction constrain the development of students' critical thinking skills. Similar conclusions have been highlighted by subsequent studies, which indicate that teacher-centered learning practices reduce opportunities for students to actively engage in reasoning processes (Darmawati & Mustadi, 2023; Yatri et al., 2023). In contrast, research by Yatri, Boeriswati, and Bintoro (2023) demonstrated that integrating TPACK-based learning media into social studies instruction can enhance students' critical thinking skills, particularly in interpreting information and analyzing social issues.

2.2 Problem-solving skill based on the polya model

The Polya problem solving model (1945, 1957), which consists of four stages, namely understanding the problem devising a plan carrying out the plan and looking back, has become a fundamental framework in research on mathematical problem solving and has been widely adapted to various other learning domains (Schoenfeld, 1987; Riyadi et al., 2021; Sari et al., 2024; Vessonen et al., 2024). Riyadi Syarifah and Nikmaturrohmah (2021) analyzed primary students' problem-solving skills using Polya's four stages and found that students performed best at the understanding the problem stage, with a success rate of 78 percent. However, students experienced considerable difficulties during the evaluation and reflection stages, achieving only a 42 percent success rate. This study involved 71 students from grades three, four, and five in primary schools in Surakarta and employed word problems at three levels of complexity: one-step, two-step, and multi-step (Riyadi et al., 2021).

Another study that underscores the importance of the Polya model was conducted by Sari et al. (2024), which confirms that using the Polya model in primary school mathematics learning significantly increases students' problem-solving skills. This quasi-experimental research involved 60 fifth-grade students and found that the group that received Polya-based learning intervention showed significant improvement in all stages of problem solving, especially in the planning and strategy implementation stages ($p < 0.05$) (Sari et al., 2024; Nguyen et al., 2023; Khofifah et al., 2024). Schoenfeld (1987), in his book Cognitive Science and Mathematics Education, emphasizes the importance of metacognition in the problem-solving process. Schoenfeld argues that the skill to monitor and regulate one's own thought processes during problem solving is a key skill that differentiates effective problem solvers from less effective ones, and that problem solving cannot be separated from critical thinking skills (Schoenfeld, 1987; Maksum et al., 2021; Perdani et al., 2023).

2.3 Social studies learning as a context for the development of critical thinking and problem-solving skills

Social Studies, as a discipline that examines social, economic, cultural, and political phenomena, offers a meaningful learning context for fostering higher-order thinking skills (Tunkler & Akman, 2023; Qondias et al., 2022; Sasmita et al., 2022). Tunkler and Akman (2023) argue that contemporary social studies instruction should be intentionally designed to enhance students' capacity to analyze social issues, appreciate multiple perspectives, and make evidence-based decisions by integrating critical thinking with creativity, collaboration, and communication. In line with this, Lingga et al. (2025) explained that social studies in primary school explore social and cultural life, as well as global issues. With that, the community can

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later face global situations in an increasingly complex era. Through social studies, students gain benefits such as the ability to think critically and solve problems, as the material relates to social issues. This view is consistent with the findings of Witarsa and Muhammad (2023), who highlight the role of project-based learning in social studies as an effective approach for strengthening critical thinking skills, particularly among pre-service teacher students. Social studies in primary school not only explains material or information about culture or phenomena in the world, but through this learning, students can learn to analyze and interpret social events, interact with classmates, and connect new knowledge with their prior knowledge to correlate social events with the students' real life (Rizal et al., 2026).

Qondias, Lasmawan, Dantes, and Aryana (2022) demonstrated that the implementation of multicultural-oriented problem-based learning effectively enhances primary students' critical thinking skill as well as their social attitudes. Their quasi-experimental study, which involved 60 fifth-grade students in East Nusa Tenggara, revealed that students in the experimental group showed notable improvements in analytical skills, evaluation, and inference after engaging in learning activities that encouraged them to explore social issues from multiple perspectives. These findings reveal that learning environments that promote inquiry and openness to diverse viewpoints contribute positively to the development of higher-level thinking skills. Supporting evidence is provided by Darmawati and Mustadi (2023), who reported that the application of problem-centered learning in social studies can significantly improve primary students' critical thinking skills through investigative, collaborative, and reflective learning processes. Their action research with 32 sixth-grade students showed a substantial increase in average critical-thinking scores across learning cycles, indicating the effectiveness of problem-oriented instructional approaches in strengthening students' analytical capacities (Darmawati & Mustadi, 2023; Sasmita et al., 2022; Yatri et al., 2023).

Social studies offers a meaningful setting for the simultaneous development of critical thinking and problem-solving skills, as the subject inherently engages students with complex social situations that require analysis and decision-making (Maksum et al., 2021; Qondias et al., 2022; Witarsa & Muhammad, 2023). Thornhill Miller et al. (2023) highlight that creativity, critical thinking, communication, and collaboration are interconnected competencies that should be fostered in an integrated manner through learning experiences grounded in authentic problem solving and closely related to students' real-life contexts. In line with this perspective, Witarsa and Muhammad (2023) argue that social studies instruction at the higher education level should be reinforced through project-based learning in order to strengthen pre-service teachers' critical thinking skills. This pedagogical recommendation is also relevant for primary education, particularly when social studies learning incorporates contemporary social issues and provides students with authentic opportunities to engage in problem-solving activities that reflect real social challenges (Witarsa & Muhammad, 2023; Darmawati & Mustadi, 2023; Sasmita et al., 2022).

3. Method

3.1 Research approach and design

This research uses a quantitative, correlational approach to determine the relationship between critical thinking and problem-solving skills in Social Studies among primary students. A correlational design was used because it aligns with the research objectives, which focus on analyzing relationships between variables without administering experimental treatments to

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subjects (Creswell & Creswell, 2018). The correlational approach allows researchers to empirically identify the strength and direction of the relationship between two research variables.

3.2 Research settings and participants

This study involves four schools in a single development area. The research samples were selected using purposive sampling. The purposive selection of samples is due to this study involving schools with students who have similar characteristics within a single development area or village. The number of samples in each school was SD A with 30 students, SD B with 18 students, SD C with 14 students, and SD D with 19 students. Hence, the total research sample was 81 students. The selection of sixth-grade students is based on the premise that students at this level have had sufficient social studies experience and are at a stage of cognitive development that enables them to think critically and solve problems systematically (Encabo-Fernández et al., 2023).

3.3. Data collection

Critical thinking skills are measured using tests based on critical thinking indicators, which include interpreting, analyzing, evaluating, inferring, and explaining, according to frameworks developed by Facione (1990, 2015) and Brookhart (2010). This instrument is contextualized with social studies material at the primary school level as recommended by Yatri, Boeriswati, and Bintoro (2023) and adapted to the characteristics of social studies, which focuses on the analysis of social phenomena (Encabo Fernández et al., 2023). The test consists of 5 descriptive question items, each measuring a single indicator of critical thinking in the context of social issues relevant to primary students' lives.

Problem-solving skills were assessed using a Likert-scale questionnaire developed with reference to the frameworks proposed by Polya (1945, 1957) and Maksum, Widiana, and Marini (2021), which conceptualize problem-solving as a process consisting of four sequential stages. These stages include understanding the problem, planning an appropriate solution, implementing the selected strategy, and evaluating the results. The questionnaire comprised 12 statements distributed across four dimensions that correspond to each stage of the problem-solving process, with response options ranging from one representing strongly disagree to five representing strongly agree. The development of this instrument was informed by previous studies emphasizing the importance of systematically measuring problem-solving processes among primary students, particularly those highlighting metacognitive aspects of problem-solving (Schoenfeld, 1987; Alpizar et al., 2022).

3.4. Data analysis

The collected data were analyzed using descriptive statistics to characterize students' profiles of critical thinking and problem-solving skills. Before conducting the correlation test, the researcher performed a normality test using the Kolmogorov-Smirnov test to assess the data distribution. The normality test results indicated that the two variables were not normally distributed ($p < 0.05$); hence, the correlation analysis used the Spearman Rank correlation as an alternative to parametric tests. Spearman's rank correlation is used because it is suitable for ordinal data or data that do not meet the assumptions of normality (Sugiyono, 2022). All statistical analyses were carried out using SPSS version 26 software with a significance level of $\alpha = 0.05$. The research results are expected to provide an empirical picture of the relationship between these two high-level thinking skills in the context of social studies learning in primary

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schools and serve as a basis for developing learning strategies that foster critical reasoning and problem-solving skills from an early age.

3.5. Trustworthiness

To enhance trustworthiness, several strategies were employed. Credibility was supported by experts who validated the instrument for critical thinking and problem-solving skills. The instruments have been validated by two basic education experts and one social studies expert using content validity, with a Content Validity Ratio (CVR) indicating that all items are valid after the revision of one item. First, the researcher applied for research permission to the principal of each school. Second, the researcher conducted outreach to sixth-grade teachers regarding the aims and procedures of the research. Third, the critical thinking test was administered face-to-face for 90 minutes under the supervision of researchers and class teachers to ensure the objectivity of data collection. Fourth, the problem-solving skill questionnaire was administered in a separate 45-minute session after the critical thinking test. After completing the students' critical thinking and problem-solving skill tests, the researcher validated the instruments. Moreover, instrument reliability was assessed using Cronbach's alpha, yielding values of 0.87 for the critical thinking test and 0.84 for the problem-solving questionnaire, indicating high internal consistency.

3.6. Ethical considerations

This research involves primary students and classroom teachers; the researcher must adhere to ethical standards to protect the privacy of the students and the school, thereby. The researcher requested permission from the 6th-grade students to conduct tests on critical thinking and problem-solving skills in science and social studies. The researcher explained that the students' names would not appear in any publication; thus, they do not need to worry if their test results are not as expected. Students who feel uncomfortable participating in the research are allowed to not take the test. The researcher also explained that this test is for research purposes and not to measure school achievements.

4. Results

This section presents the results of data analysis obtained from 81 grade VI students spread across four primary schools in Cilacap. An analysis was conducted to describe the profiles of students' critical thinking and problem-solving skills and to identify the relationship between these two variables. The research results are presented sequentially, starting with descriptive analysis, which describes the average skill of students in each school, followed by pre-requisite analysis tests in the form of data normality tests, and ending with the Spearman Rank correlation test to determine the strength and direction of the relationship between critical thinking and problem-solving skills.

Table 1. Descriptive statistical analysis of critical thinking and problem-solving skills

No	Schools	Sample Size	Mean of Critical Thinking Skill	Mean of Problem-Solving Skill
1.	SD A	30	70.50	74.28
2.	SD B	18	70.28	74.16
3.	SD C	14	72.14	77.43
4.	SD D	19	68.95	73.26

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To determine the scores for critical thinking and problem-solving, the researcher identifies the minimum and maximum scores and subsequently sets score limits to categorize students' critical-thinking skills. The maximum score for critical thinking skill is 100, while the minimum score is 25. Furthermore, the researcher establishes the assessment score limits using the interval formula. Consequently, the researcher determines the score categories. There are low (25-45), sufficient (46-66), good (67-87), and very good (88-100). Based on Table 1, the average scores for critical thinking and problem-solving skills fall into the good category. Although the students' average scores are in the good category, the score acquisition is not very high. After conducting descriptive statistical tests, the researcher proceeds with inferential statistical tests. The first step is to carry out a normality test. Sourced from indicators of critical thinking skills, which consist of interpreting, analyzing, evaluating, inferring, and explaining reasons. The indicator that obtained the highest score is analyzing with a score of 80.35, while inferring obtains the lowest score at 69.46. Meanwhile, it is viewed through the lens of problem-solving indicators, which include understanding the problem, planning a resolution, applying strategies, and evaluating results. The indicator of understanding the problem indicates the highest score, 82.68, while the evaluation results show the lowest, 66.34.

Table 2. Normality test of critical thinking and problem-solving skills

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Skills	**Statistic**	**Df**	**Sig.**	**Statistic**	**df**	**Sig.**
Values	Critical	.112	81	.014	.950	81	.003
	Problem	.120	81	.006	.953	81	.005

a. Lilliefors Significance Correction

As shown in Table 2, the results of the normality test for critical thinking skills yield a significance value of 0.014, which is less than 0.05. Therefore, the data are not normally distributed. Subsequently, the normality test result for problem-solving skill is 0.006, which is less than 0.05; thus, the data are not normally distributed. As the two data sets are not normally distributed, the next step is to use the Spearman rank correlation test to test variable correlation.

Table 3. Correlation test between critical thinking and problem-solving skills

Correlations

			critical	problem
Spearman's rho	Critical	Correlation Coefficient	1.000	.914**
		Sig. (2-tailed)	.	.000
		N	81	81
	problem	Correlation Coefficient	.914**	1.000
		Sig. (2-tailed)	.000	.
		N	81	81

As illustrated in Table 3, the correlation coefficient is 0.914. Referring to the r table, the correlation coefficient falls in the strong category; hence, the relationship between the two variables is positive. Thus, if critical thinking skills increase, problem-solving skills also increase. Subsequently, the results in Table 3 show a significance value of 0.000; this value is less than 0.05, indicating a relationship between critical thinking skill and problem-solving skill.

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5. Discussion

The research results indicate that the critical thinking skills of class VI students fall in the medium-to-high category across all sample schools. If it is related to indicators according to Facione, which include interpretation, analysis, evaluation, inference, and explanation, most students appear strong in the interpretation aspect because they are able to understand and interpret information in social studies. This finding is consistent with the report by Dewi et al. (2023), which found that primary students' interpretation skills tend to be more mature than their analysis and evaluation skills. Syahrul et al. (2020) also found that explanation is often more developed than inference, as in-depth analysis exercises remain limited to conventional learning contexts.

The research findings specifically address the gap in empirical research on the relationship between critical thinking and problem-solving skills in the context of social studies in Indonesian primary schools. As identified in the literature review, previous research has focused primarily on developing a single skill, either in isolation or in contexts outside social studies (Witarsa & Muhammad, 2023; Hmelo-Silver, 2004). This research strengthens the findings from Maksum et al. (2021) and Amrina (2024) by providing more robust empirical evidence through a larger sample and a social studies context rich in social issues. Furthermore, the correlation coefficient of 0.914 in this study indicates a stronger relationship than that reported by Perdani et al. (2023). This research examined the association between critical thinking and problem solving skills among junior high school students, specifically focusing on Climate Change. The correlation coefficient was calculated to be 0.74, indicating a strong and positive relationship between critical thinking and problem-solving skills (Perdani et al, 2023).

In primary school, basic skills such as critical thinking can be developed by facilitating learning that provides students with opportunities to ask questions, explain their opinions or ideas, and make decisions. According to Piaget's theory of child development, primary students are typically 7 to 11 years old and fall into the concrete operational stage. As such, they should be given opportunities to think logically about the material presented to them. One way to develop students' critical thinking skills is by studying social studies. Through social studies, students learn to observe an event, make predictions, identify variables, analyze data, and draw conclusions (Sitorus, Kurnia, & Widyastika, 2025). Critical thinking skills in social studies are highly relevant because the subject's nature requires students to understand social phenomena from diverse perspectives. Sasmita et al. (2022) confirmed that social context-based learning strategies can significantly improve analysis and inference skills. On the other hand, Susanti and Widodo (2021) show that discussing social issues improves students' evaluation skills as they weigh different pieces of evidence. Hafidz et al.'s study (2021) confirmed that learning strategies based on higher-order thinking skills in social studies strengthen explanation and inference skills because students are trained to provide logical reasons for the decisions they make.

By identifying problems, students can use their critical thinking to recognize and understand the issues presented by the teacher. Second, in analyzing learning, students are usually asked to analyze information, observe pictures, and watch videos; in this case. Furthermore, the third is to solve problems, and critical thinking skills are needed to do so. In this case, the students are not yet able to solve problems on their own; they still need guidance and direction. Subsequently, the fourth is to conclude. This learning activity encourages students to think critically and retain the material they have learned (Dafit, Gurning, & Anggriani, 2024).

Students' problem-solving skills also demonstrate a high level, as evidenced by Polya's four steps: understanding the problem, planning a solution, developing a strategy, and evaluating the results. Astuti et al. (2019) reported that primary students mostly mastered the step of

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understanding the problem easily, but often experienced difficulties at the stage of evaluating the results. Rahmawati et al. (2021) also found that although students were able to develop strategies, they were still not strong enough to reflect on their effectiveness. Pratiwi and Suryani's (2020) research indicates that reflection skills can be improved through explicit exercises that emphasize re-evaluating chosen solutions.

The Spearman correlation test yields a correlation coefficient of 0.914 and a significance level of 0.000. This indicates a very strong relationship between critical thinking and problem-solving skills. Amrina et al. (2024) noted that analysis and inference skills are directly correlated with the quality of students' problem-solving strategies. Ningsih et al. (2020) found that evaluation plays an essential role in accurately identifying the roots of social problems. Putri and Kurniawan (2022) also stated that the skill of explaining makes a significant contribution to students' success at the strategy development stage because logically explaining steps helps implement effective strategies.

The strong relationship between these two variables can be explained by integrating Facione's indicators and Polya's stages in learning situations. When students can interpret and analyze, they are at the initial stage of understanding the problem. Furthermore, evaluation and inference skills are very influential in planning solutions. Widyaningrum and Rahayu (2019) stated that problem-solving cannot be separated from critical thinking skills, as students must determine whether the available information is sufficient to serve as the basis for decision-making. Aprilianti and Nisa (2023) also imply that greater explanation is associated with students' greater ability to evaluate results, because reflection requires the ability to re-explain the reasons underlying strategy selection.

Overall, the research findings indicate that critical thinking skills serve as a fundamental basis for developing problem-solving skills in social studies. Instructional practices that incorporate authentic social issues, reflective dialogue, and higher-order thinking activities have been shown to support the simultaneous improvement of both competencies. Previous studies have consistently reported that enhancements in students' skills in analyzing information, evaluating evidence, and articulating explanations are closely associated with improvements in the effectiveness of their problem-solving strategies (Dewi et al., 2023; Amrina et al., 2024; Aprilianti & Nisa, 2023). Consequently, social studies teachers are encouraged to design learning experiences that intentionally cultivate key dimensions of critical thinking alongside structured stages of problem-solving, enabling students to develop reasoned, solution-oriented responses to social challenges in their everyday environments.

Empirical investigations examining the association between critical thinking and problem-solving skills have consistently reported a strong, positive relationship between these two constructs (Maksum et al., 2021; Perdani et al., 2023; Amrina, 2024). A study conducted by Perdani, Hernani, and Ramalis (2023), involving 272 junior high school students, reported a correlation coefficient of 0.74 with a significance level below 0.001, indicating a substantial relationship between critical thinking and problem-solving in the context of climate change learning. The study employed validated instruments and conducted statistical analyses in SPSS version 23 and Winstep version 5.4.1 to classify students' skills using the Rasch model. The reported determination value of 0.546 indicates that critical thinking skill accounted for 54.6 percent of the variance in students' problem-solving performance. Consistent results were also reported by Lismayani, Mahanal, and Sulawesi (2017), who identified a significant positive correlation between critical thinking and problem-solving skills in the context of social learning.

Amrina (2024) conducted a descriptive correlational study involving 127 fifth-grade primary students and reported a significant relationship among critical thinking skills, creative thinking

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skills, and problem-solving performance in mathematics learning, with a correlation coefficient of 0.68 and a significance level below 0.01. These results reveal that critical thinking plays a substantial role in developing students' skills for addressing complex problems, particularly in contextual learning environments that integrate real-world situations into instructional activities (Amrina, 2024; Witarsa & Muhammad, 2023). Maksum, Widiana, and Marini (2021) employed path analysis with a sample of 240 primary students and found that critical thinking skills exerted a significant direct effect on problem-solving skills in social studies. Their findings also revealed that self-regulation and social skills served as mediating factors in this relationship, indicating that problem-solving performance is shaped not only by cognitive processes but also by the affective and social dimensions of learning (Maksum et al., 2021; Qondias et al., 2022).

Other research that strengthens the relationship between critical thinking and problem solving skills was conducted by Yu and Zin (2023) who found that the adaptation of the Problem-Based Learning model which was oriented towards developing critical thinking consistently showed higher effectiveness in improving problem solving skill compared to conventional PBL, with effect sizes ranging from 0.65 to 1.24 (Yu & Zin, 2023; Hmelo Silver, 2004). These findings reveal that critical-thinking dispositions such as curiosity, open-mindedness, and persistence correlate with problem-solving skills and have crucial implications for students' character development since primary school (Perdani et al., 2023; Thornhill Miller et al., 2023; Amrina, 2024).

One of the roles of critical thinking skills in learning is making decisions to solve problems in learning. Critical thinking involves the skill to identify and evaluate arguments, recognize underlying assumptions, and make decisions based on logical evidence. In the educational context, critical thinking is crucial for equipping students with the analytical and problem-solving skills needed in the information era (Putri et al., 2023). Critical thinking skills in learning prepare students to solve problems and not give up easily when completing tasks. In addition, critical thinking skills are also needed for students from primary school to help them respond to the problems they face. Critical thinking skills are crucial in everyday life because they help students solve problems. Furthermore, critical thinking skills also develop through problem-solving, as students cannot be separated from the ability to think and to find the most accurate evidence and reasoning. (Anggrarina, Rakhmawati, & Purnamasari, 2025).

6. Conclusion and implications

As indicated by the research findings, the researcher found a relationship between critical thinking and problem-solving abilities. The research results, using the Spearman correlation test, revealed a relationship. Meanwhile, based on the average scores of critical thinking and problem-solving skills, they fall into the good category. The test results indicate a correlation between critical thinking and problem-solving abilities. Critical thinking plays a role in problem-solving because it is needed to analyze problems and choose strategies. In addition, the implications for learning are that teachers need to implement learning models or worksheets that facilitate students' thinking and problem-solving, enabling both abilities to run simultaneously. These findings confirm that critical thinking is an essential foundation for formulating, implementing, and evaluating problem-solving strategies, especially in the context of social studies that involve social issues and information analysis.

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First Author: Conceptualization, Methodology, Formal analysis, Writing original draft, Project administration. **Second Author**: Data curation , Resources, Writing review & editing.

Declaration of competing interest
The authors declare that they have no known personal relationships that could have influenced the work reported in this paper.

Data Availability Statement
Researchers are permitted to present the findings of the study; however, they must not disclose the identities of participants in order to maintain confidentiality and uphold research ethics.

Ethical Declaration
This study was conducted in accordance with ethical standards based on the Declaration of Helsinki. Informed consent was obtained from all participants prior to their involvement in the study. Participants were informed about the purpose of the study, procedures, and their right to withdraw at any time without any consequences. The confidentiality of participant data was strictly maintained throughout the research process.

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Declaration of AI statement
This manuscript utilized ChatGPT in a limited manner to improve clarity, coherence, and academic language quality. The AI tool was used solely for supportive purposes and was not involved in data analysis, interpretation of results, or conclusions. All AI-assisted outputs were critically reviewed, revised, and validated by the authors, who take full responsibility for the final content.

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