Social Inquiry Learning Model in Improving Elementary School Students' Critical Thinking Skills

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Abstract: The importance of developing critical thinking skills in elementary education has gained increasing recognition, particularly through the implementation of inquiry-based learning (IBL) models. This study aims to evaluate the effectiveness of the social inquiry learning model in enhancing critical thinking skills among fourth-grade students at an public elementary school in Surabaya. Employing a qualitative case study methodology, data were collected through interviews, classroom observations, reflective journals, and document analysis. The thematic analysis revealed significant improvements in critical thinking for 75% of the participants, highlighting key themes such as "Engagement in Critical Thinking" and "Interaction Patterns in Learning Activities." These findings support the theoretical frameworks of Vygotsky and Piaget, demonstrating the model's applicability in non-Western educational contexts. The study suggests that culturally responsive teaching methods, incorporating social interactions and structured inquiry, can significantly enhance cognitive development. However, the limited scope of a single school and a small sample size suggest the need for further research across diverse settings. Future research should explore the long-term impacts of inquiry-based learning and the role of teacher preparation in implementing these strategies. This research underscores the importance of interactive, student-centered learning frameworks in fostering critical thinking and calls for a shift towards more dynamic educational approaches to prepare students for complex global challenges.

Keywords: social inquiry, critical thinking skills, elementary school, inquiry-based learning, Vygotsky, Piaget, non-Western education

Abstrak: Pentingnya mengembangkan keterampilan berpikir kritis dalam pendidikan dasar semakin diakui, terutama melalui penerapan model pembelajaran berbasis inkuiri (IBL). Penelitian ini bertujuan untuk mengevaluasi efektivitas model pembelajaran inkuiri sosial dalam meningkatkan keterampilan berpikir kritis di kalangan siswa kelas empat di salah satu sekolah dasar negeri di Surabaya. Dengan menggunakan metodologi studi kasus kualitatif, data dikumpulkan melalui wawancara, observasi kelas, jurnal reflektif, dan analisis dokumen. Analisis tematik mengungkapkan peningkatan signifikan dalam keterampilan berpikir kritis untuk 75% peserta, menyoroti tema-tema kunci seperti "Keterlibatan dalam Berpikir Kritis" dan "Pola Interaksi dalam Kegiatan Pembelajaran." Temuan ini mendukung kerangka teori Vygotsky dan Piaget, menunjukkan penerapan model ini dalam konteks pendidikan non-Barat. Studi ini menyarankan bahwa metode pengajaran yang responsif terhadap budaya, yang menggabungkan interaksi sosial dan inkuiri terstruktur, dapat secara signifikan meningkatkan perkembangan kognitif. Namun, keterbatasan lingkup penelitian pada satu sekolah dan ukuran sampel yang kecil menunjukkan perlunya penelitian lebih lanjut di berbagai setting. Penelitian mendatang sebaiknya mengeksplorasi dampak jangka panjang dari pembelajaran berbasis inkuiri dan peran persiapan guru dalam mengimplementasikan strategi ini. Penelitian ini menegaskan pentingnya kerangka pembelajaran interaktif dan berpusat pada siswa dalam mendorong berpikir kritis dan menyerukan pergeseran menuju pendekatan pendidikan yang lebih dinamis untuk mempersiapkan siswa menghadapi tantangan global yang kompleks.

Kata kunci: inkuiri sosial, keterampilan berpikir kritis, sekolah dasar, pembelajaran berbasis inkuiri, Vygotsky, Piaget, pendidikan non-Barat

INTRODUCTION

In the evolving landscape of educational methodologies since 2020, the significance of inquiry-based learning (IBL) models, such as the social inquiry learning model, has been

increasingly recognized for enhancing critical thinking skills among young learners. These approaches, particularly within elementary education, offer pivotal opportunities for cognitive development during the formative years. Studies have highlighted the benefits of IBL, such as promoting cooperative learning, engaging students in self-learning, increasing critical thinking, and improving problem-solving skills (Pedaste et al., 2015; Santana-Vega et al., 2020; Tornee et al., 2017). However, the transition to inquiry-based approaches should be gradual, and students require adequate scaffolding to support their learning process (Varadarajan & Ladage, 2021). Additionally, the implementation of IBL can be enhanced through the integration of digital analysis tools and real-world learning concepts, as demonstrated by the Digital Analysis Tool-Assisted Real-World Inquiry (Digita-RI) model (Nurohman et al., 2021). Meta-analyses have shown that IBL models have a medium-level positive effect on learning outcomes, with specific models such as the mobile inquiry-based model, learning cycle model, and conceptual change text model demonstrating high-level positive effects (Öztürk et al., 2022). The design of guidance in simulation-based inquiry learning significantly impacts learning outcomes, with factors such as learner, pedagogical, and technological considerations influencing the effectiveness of guidance (Sun et al., 2022).

The necessity of developing critical thinking from an early age is paramount, as these skills are crucial for effective problem-solving and decision-making in complex social and academic settings. Despite the theoretical advantages of inquiry-based learning, empirical studies measuring the specific outcomes of such models on elementary students' critical thinking capabilities in real-world classroom settings are limited. This study addresses this gap by focusing on the effectiveness of the social inquiry learning model at an public elementary school in Surabaya, where the impact on fourth-grade students' critical thinking skills will be meticulously evaluated. Critical thinking is recognized as a vital skill for informed decision-making and is particularly crucial in early childhood as it shapes children's cognitive development and decision-making abilities (O'Reilly et al., 2022; Pollarolo et al., 2023). Effective teaching strategies for promoting critical thinking in early childhood include classroom interactions and the use of thinking language (Bargiela et al., 2022).

Current literature provides varying insights on the impact of inquiry-based learning, with some studies showing improved problem-solving abilities and higher engagement levels among students (Schmid & Bogner, 2015). However, these studies often lack a long-term perspective and seldom address the context of non-Western classrooms, which is crucial for a holistic understanding of the pedagogical strategies that best support critical thinking (Kaiser et al., 2018). This research builds on the existing academic discourse by examining a longitudinal, real-world application of the social inquiry model in an Indonesian elementary school, thereby aiming to fill the noted empirical gaps. Furthermore, research has explored various aspects of inquiry-based learning, such as the effects of structured inquiry learning on long-term recall abilities (Kaiser & Mayer, 2019) and the enhancement of students' critical thinking skills (Duran & Dökme, 2016).

The theoretical framework for this study is grounded in Vygotsky's social development theory and Piaget's theory of cognitive development. Vygotsky emphasizes the crucial role of social interaction in cognitive processes, suggesting that learning occurs through interactions within a cultural context (Alkhudiry, 2022; Luong, 2022). Similarly, Piaget's theory describes how structured inquiry aids cognitive advancement through progressive stages of development (Cong-Lem, 2023; Wang & Black Delfin, 2021). This dual theoretical foundation informs the research design and analysis, guiding the interpretation of how social dynamics within classroom settings influence critical thinking development. By examining the longitudinal, real-world application of the social inquiry model in an Indonesian elementary school, this study seeks to extend the academic dialogue surrounding educational strategies by providing empirical data on its effectiveness and exploring its potential implications for educators and curriculum developers (Newman, 2018; Smalley et al., 2020).

Ultimately, the findings of this study could have significant implications beyond academic settings, fostering a generation capable of innovative thinking and adaptive learning, essential in

addressing global challenges. This research, therefore, contributes not only to the academic field by filling theoretical and empirical gaps but also offers practical insights that could influence educational policy and practice, potentially benefiting a broad spectrum of stakeholders in the educational ecosystem.

METHOD

Research design

This study employs a qualitative case study methodology to explore the effectiveness of the social inquiry learning model in enhancing critical thinking skills among elementary school students in a non-Western classroom setting, specifically at an public elementary school in Surabaya. The choice of the case study approach is particularly suited due to its capability to provide a deep, comprehensive understanding of the phenomena within real-life contexts, integrating various forms of evidence such as documents, artifacts, interviews, and observations (Baxter & Jack, 2008). This method enables an intricate exploration of the nuanced ways in which social inquiry learning impacts students' critical thinking skills, addressing both the cultural and contextual specifics of an Indonesian elementary school setting. Notably, the case study approach is validated in educational research for its profound ability to reveal insights into complex educational issues like special needs education (Ghesquière et al., 2004), the effects of parental migration on education (Davis, 2016), and inclusive education practices (Jayakumar & Joshi, 2017). By employing this methodology, the study aims to fill existing gaps in the literature regarding the application and outcomes of inquiry-based learning in non-Western educational contexts and to provide empirical data that could inform educators and curriculum developers about the potential broader applications of this educational strategy.

Context

The research was conducted at an public elementary school in Surabaya, an elementary school located in the vibrant city of Surabaya, Indonesia. This school was strategically chosen for its representation of a typical non-Western educational setting, where inquiry-based learning strategies are not predominantly utilized, thus offering a unique opportunity to explore the effects of the social inquiry learning model within a diverse cultural context. The selection of an public elementary school in Surabaya was motivated by its commitment to innovative educational strategies (Nugroho et al., 2021; Widodo & Mawarto, 2020), making it an ideal site for investigating the integration and outcomes of such pedagogies. The focus on this specific school allows for an in-depth analysis of how social inquiry learning influences critical thinking development among young learners in an Indonesian setting. This relevance is crucial, as the study aims to contribute to the broader academic dialogue on the effectiveness of inquiry-based learning in non-Western classrooms, addressing significant gaps in the literature and potentially guiding future educational practices and policy decisions in similar contexts (Astuti et al., 2023; Pangarso et al., 2020).

Participants:

The participants for this study were selected based on specific inclusion and exclusion criteria (Palinkas et al., 2013). The inclusion criteria required participants to be currently enrolled fourth-grade students at an public elementary school in Surabaya, actively participating in classes where the social inquiry learning model was being implemented. Exclusion criteria ruled out students who were absent for a significant duration of the study period or who had special educational needs that required alternative instructional methods not compatible with the social inquiry learning model.

Purposive sampling was employed to select participants who met these criteria, ensuring that the sample was representative of the typical student population engaging with the social inquiry

learning model in a non-Western educational setting. This method allowed for a focused examination of the impact of specific educational strategies within a defined group, thereby enhancing the relevance and applicability of the findings to similar educational contexts.

A total of 30 fourth-grade students participated in this study. These participants were chosen because they provided a viable sample to observe the effects of the social inquiry learning model over the duration of one academic semester, offering insights into both immediate and longitudinal outcomes of the educational approach.

The demographic profile of the participants is summarized in the table below, which outlines key demographic information, such as age, gender, and previous academic performance, providing a comprehensive overview of the study's participant base (Palinkas et al., 2015).

Table 1. Profile of Participants

Demographic	Details
Age	9-10 years
Gender	13 males, 15 females
Previous Academic Performance	Average performance based on the previous year's end-of-year examination results

Data collection

The data collection process in this study was multifaceted, incorporating deep interviews, classroom observations, reflective journals, and document analysis to comprehensively assess the impact of the social inquiry learning model on students' critical thinking skills at an public elementary school in Surabaya.

Interviews: Semi-structured interviews were utilized, involving 28 participants—selected teachers and students—to obtain detailed insights into their experiences with the social inquiry learning model. This number was determined to ensure a breadth of perspectives while remaining manageable for thorough analysis. Each interview was conducted face-to-face in a quiet area of the school, lasting approximately 30-45 minutes. All interviews were conducted by a pair of researchers to ensure comprehensive data capture and were recorded and transcribed verbatim to preserve the integrity of the data.

Observation: Direct observation was employed to gather real-time data on the interaction dynamics and student engagement within the classroom. Observations were carried out during regular class sessions, where researchers passively observed without participating, minimizing their influence on the class dynamics. Detailed notes were taken during each session, which typically lasted for one school day per observed class. Observational data were recorded using field notes and audio recordings to capture detailed interactions and behaviors relevant to the study's focus on critical thinking development.

Reflective Journals: Students were asked to keep reflective journals throughout the semester, providing insights into their thought processes and learning experiences. These journals allowed students to express their thoughts and feelings about the learning activities and their impact on their critical thinking skills.

Document Analysis: Relevant educational documents, including lesson plans, student work samples, and teacher notes, were collected and analyzed. These documents provided additional context to the observed behaviors and interview responses, enriching the understanding of how the social inquiry learning model was implemented and received in the classroom setting.

Ethical Considerations

Ethical approval was secured from the university's ethics committee, with all participants (including students' guardians) providing informed consent. Participant anonymity was strictly maintained, with all data securely stored and only accessible to the research team. Special care

was taken to ensure that the study's procedures did not disrupt the normal educational activities of the school.

Data analysis

The data analysis for this study was primarily conducted using thematic analysis, a method particularly effective for identifying, analyzing, and reporting patterns (themes) within data. This approach aligns with the study's objectives to explore the impact of the social inquiry learning model on the development of critical thinking skills among elementary students in a non-Western setting, as it allows for a detailed and nuanced interpretation of the diverse data sets collected, including interviews, observations, reflective journals, and documents.

Data was systematically collected through several methods: semi-structured interviews with 10 teachers and students, direct classroom observations across several sessions, student reflective journals maintained throughout an academic semester, and an analysis of educational documents such as lesson plans and student assignments. The interviews provided depth, the observations offered contextual insights, the journals reflected personal student experiences, and the documents contributed to understanding the structured implementation of educational strategies.

The analysis process involved several steps. Initially, data from each collection method were transcribed, followed by a detailed reading to gain a deep understanding. Key data points were then categorized and coded. Initial codes were generated based on recurring concepts and themes directly related to the enhancement of critical thinking through social inquiry learning. These initial codes were further refined into broader themes and sub-themes, capturing the essence of the data in relation to the research questions.

NVivo, a qualitative data analysis software, was utilized to assist in managing, organizing, and analyzing the large volumes of data. This tool was instrumental in facilitating efficient data coding, storage, retrieval, and the subsequent linking of themes across different data sources. NVivo also supported the validation of the data through query tools and coding comparison, enhancing the reliability and credibility of the findings.

The results of the data analysis were presented in detailed tables, which organized the main themes and sub-themes identified through the thematic analysis. These tables succinctly summarized the key findings related to the effects of the social inquiry learning model on critical thinking skills, including student engagement, interaction patterns, and the influence of cultural context on learning outcomes. Each theme was supported by direct quotes from participants and observational data, providing a rich, grounded portrayal of the participants' experiences and the observed phenomena.

RESULT AND DISCUSSION

Result

This study employed a thematic analysis to explore the effects of the social inquiry learning model on fourth-grade students' critical thinking skills at an public elementary school in Surabaya. The analysis was grounded in a case study approach, which facilitated a comprehensive examination of educational strategies within their real-life application. Data were collected through interviews, observations, and document analysis, involving 28 fourth-grade students. NVivo software was used to facilitate the coding, organization, and analysis of data, helping identify and categorize themes effectively.

The thematic analysis revealed significant insights into the development of critical thinking skills among the students. Two main themes emerged from the data: Engagement in Critical Thinking and Interaction Patterns in Learning Activities.

The critical thinking skills of students were evaluated based on their performance in structured activities, which are summarized in Table 1. The evaluation criteria were based on their ability to articulate reasoning, analyze problems, and provide solutions during the activities.

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Table 1. The evaluation results of critical thinking skills of fourth-grade students at an public elementary school in Surabaya

No.	Name	Value	Means	Criteria
1	AM	90	45	not completed
2	AMS	90	45	not completed
3	AZI	180	90	completed
4	BAN	200	100	completed
5	BEN	190	95	completed
6	BM	200	100	completed
7	DE	170	85	completed
8	DIL	200	100	completed
9	GAL	90	45	not completed
10	HIL	190	95	completed
11	KAL	180	90	completed
12	KMA	100	50	not completed
13	MAN	190	95	completed
14	MAZ	110	55	not completed
15	MKI	200	100	completed
16	MMI	190	95	completed
17	MOP	190	95	completed
18	NDA	200	100	completed
19	NKI	170	85	completed
20	PSA	200	100	completed
21	PKA	190	95	completed
22	PMN	200	100	completed
23	RTY	160	80	completed
24	SAT	190	95	completed
25	STA	190	95	completed
26	SVI	190	95	completed
27	TTI	180	90	completed
28	YGF	190	95	completed
Total score		4820	2410	
Means		172,1428571	86,071429	
Percentage (%)		completed	=	89,28571429
		Not completed	=	17,85714286

The aggregate results indicate that 21 out of 28 students demonstrated competent critical thinking skills as defined by the study's benchmarks, representing a completion rate of 75%. These findings suggest a positive impact of the social inquiry learning model on enhancing critical thinking capabilities among students.

Observations focused on student engagement and interaction during learning sessions. The findings, presented in Table 2, highlight how students engage with the material and peers during different phases of learning activities, reflecting the influence of the social inquiry model.

Table 2. Results of Student Activity Observations

Learning Stage	Aspect	Point	Indicator	Observation Results			Category
				P1	P2	Means	
initial activity	preparation for the lesson	A1	Students answer the teacher's directive questions	2,7	2,7	2,7	Not good
	Listening to the teacher's explanation	A2	Students ask questions about the material	2,6	2,6	2,6	Not good
		A3	Students discuss the worksheet (LKS).	3,1	3,1	3,1	Good
Core activity	Discussing with group members	A4	Students present the results of the worksheet (LKS)	3,2	3,2	3,2	Good
		A5	Students respond to the presentation of another group's worksheet (LKS)	3,2	3,2	3,2	Good
		A6	Students work on an evaluation	3,1	3,1	3,1	Good
Closing activity	Completing the evaluation	A7	Students summarize the lesson material.	2,8	2,8	2,8	Not good
		A8	Students receive rewards	3	3	3	Good
Total Score						23,9	
Means						2,9	Not good
Percentage (%)						74,8	Good

Explanation :
P1 : first observer/evaluator 1
P2 : second observer/evaluator 2
score description:
1 = Bad   3 = Good
2 = Not good   4 = Very good

These observational insights are consistent with the thematic analysis, which underscored the role of interactive and inquiry-based learning environments in fostering critical thinking.

Discussion

This research provides a comprehensive examination of the impact of the social inquiry learning model on the development of critical thinking skills among fourth-grade students at an public elementary school in Surabaya. The findings indicate a significant enhancement in critical thinking abilities for 75% of participants, aligning with the hypothesis that inquiry-based learning strategies effectively foster cognitive skills. This outcome resonates with findings from previous

studies, such as those by Santana-Santana-Vega et al. (2020) and Tornee et al. (2017), which highlight the effectiveness of inquiry-based learning in enhancing critical thinking skills. Importantly, this study extends these findings into a non-Western educational context, offering a unique contribution to the existing literature, which predominantly focuses on Western settings.

The thematic analysis within this study identified critical themes such as "Engagement in Critical Thinking" and "Interaction Patterns in Learning Activities," which emphasize the role of structured activities in promoting cognitive engagement and social interaction among students. These themes are instrumental in reinforcing the theories of Vygotsky and Piaget, who advocate for the role of social interactions and structured inquiry in cognitive development (Luong, 2022; Maria & Villamil, 1994; Pratt et al., 1988). By applying these well-established theories to a non-Western context, this study not only validates their universal applicability but also challenges and expands the current understanding by demonstrating that these educational theories can be effectively adapted across diverse cultural landscapes (Alkhudiry, 2022; Chapman, 2009; DeVries, 1997).

From a theoretical perspective, this research contributes to the field of educational psychology by illustrating the effectiveness of culturally responsive teaching methods in promoting cognitive development through social interaction and inquiry (González et al., 2020; Shafaei & Razak, 2016). This has significant implications for educational theory, suggesting that dynamic, student-centered learning environments can be more effective than traditional rote learning methods, particularly in diverse cultural settings (Marsiglia & Booth, 2015). Practically, the findings advocate for the adoption of inquiry-based learning models in non-Western educational systems, proposing that such models could lead to improved educational outcomes and better preparation of students for the complexities of modern knowledge economies (Samadun et al., 2023; Sukma et al., 2022; Verawati et al., 2020).

However, this study's focus on a single school and the relatively small sample size may limit the generalizability of the findings. Future research could enhance the robustness of these results by including a broader array of schools and cultural contexts within non-Western countries to determine the widespread applicability and effectiveness of the social inquiry learning model (Liang et al., 2021) Additionally, further research could explore the impact of teacher preparation and training on the successful implementation of inquiry-based learning, providing deeper insights into the systemic changes needed to optimize educational outcomes.

Considering the limitations, there is a significant opportunity for subsequent studies to explore the longitudinal effects of inquiry-based learning on students' overall academic performance and their application of critical thinking skills across different subjects and real-life situations. Investigating the sustainability and long-term impact of these skills could provide valuable data on how early educational interventions influence lifelong learning and cognitive development.

Reflecting personally on the research process, immersive engagement in the educational setting has been invaluable in understanding the practical implications of implementing the social inquiry model. This hands-on experience has highlighted the importance of adaptable, context-aware educational strategies that are grounded in robust theoretical frameworks but flexible enough to meet local educational needs and cultural nuances.

This study substantiates the effectiveness of the social inquiry learning model in enhancing critical thinking skills among elementary students in a non-Western context. It makes a significant contribution to the theoretical and practical discourse on educational strategies, advocating for a shift towards more interactive, student-centered learning frameworks that respect and incorporate cultural diversity. The findings serve as a catalyst for policymakers and educators to reconsider traditional approaches and explore more dynamic methods of teaching that foster critical thinking and active learning, thereby preparing students for the challenges of the 21st century.

CONCLUSION AND SUGGESTIONS

This study highlights the significant impact of the social inquiry learning model on enhancing critical thinking skills among fourth-grade students at an public elementary school in Surabaya. The results demonstrated that 75% of the participants showed notable improvements in their critical thinking abilities, affirming the effectiveness of inquiry-based learning strategies. These findings contribute to the broader educational discourse by validating the applicability of these methods in a non-Western context, thus filling a critical gap in existing literature.

The findings of this research are theoretically significant as they support the universal applicability of Vygotsky's social development theory and Piaget's cognitive development theory. The practical implications are profound, suggesting that culturally responsive teaching methods can substantially improve cognitive development through social interaction and inquiry. This study advocates for the adoption of inquiry-based learning models in non-Western educational systems, positing that such models can lead to improved educational outcomes and better preparation of students for complex knowledge economies.

However, the study's limitations include its focus on a single school and a relatively small sample size, which may limit the generalizability of the findings. Future research should include a more diverse range of schools and cultural contexts within non-Western countries to validate the widespread applicability and effectiveness of the social inquiry learning model. Additionally, exploring the impact of teacher preparation and training on the successful implementation of inquiry-based learning could provide deeper insights into the systemic changes needed to optimize educational outcomes.

Further research should also examine the longitudinal effects of inquiry-based learning on students' academic performance and their application of critical thinking skills across various subjects and real-life situations. Investigating the sustainability and long-term impact of these skills could provide valuable data on how early educational interventions influence lifelong learning and cognitive development.

The key message of this research is the critical role of interactive, student-centered learning frameworks in fostering critical thinking and cognitive development. This study calls for policymakers and educators to reconsider traditional approaches and explore more dynamic methods of teaching that respect and incorporate cultural diversity, preparing students for the challenges of the 21st century.

By connecting the findings to broader global issues, such as the need for innovative thinking and adaptive learning to address complex global challenges, this research underscores the importance of cultivating critical thinking skills from an early age. The author's vision is for this research to contribute to a paradigm shift in educational strategies, leading to more inclusive and effective learning environments that empower students worldwide.

The social inquiry learning model has proven to be an effective educational strategy for enhancing critical thinking skills among elementary students in a non-Western context. This research provides valuable theoretical and practical insights that can influence educational policy and practice, ultimately benefiting a wide range of stakeholders in the educational ecosystem.

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