

THE EFFECT OF INQUIRY-BASED LEARNING ON IMPROVING STUDENTS' CRITICAL THINKING SKILLS

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Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh penerapan model pembelajaran berbasis inquiry terhadap kemampuan berpikir kritis siswa pada mata pelajaran Qur'an Hadis kelas VII MTs Swasta Al-Hidayah Patumbak. Penelitian menggunakan pendekatan kuantitatif dengan metode quasi experiment. Subjek penelitian berjumlah 45 siswa yang terdiri atas kelas eksperimen VII A sebanyak 22 siswa dan kelas kontrol VII B sebanyak 23 siswa. Pengumpulan data dilakukan melalui tes pretest dan posttest serta angket untuk memperoleh data mengenai kemampuan berpikir kritis siswa. Analisis data meliputi uji validitas, reliabilitas, normalitas, homogenitas, dan pengujian hipotesis. Hasil penelitian menunjukkan bahwa nilai rata-rata pretest kelas eksperimen sebesar 77,73 dan posttest sebesar 75,31, sedangkan kelas kontrol memperoleh rata-rata pretest sebesar 76,43 dan posttest sebesar 76,04. Instrumen penelitian dinyatakan valid berdasarkan nilai r hitung yang lebih besar daripada r tabel dan reliabel dengan nilai Cronbach's Alpha sebesar 0,870. Secara deskriptif, hasil tersebut menunjukkan bahwa kemampuan berpikir kritis siswa pada kelas eksperimen belum mengalami peningkatan setelah penerapan pembelajaran berbasis inquiry. Oleh karena itu, kesimpulan mengenai adanya pengaruh yang signifikan perlu didasarkan pada hasil pengujian hipotesis inferensial.

Kata Kunci: Pembelajaran Berbasis Inquiry, Kemampuan Berpikir Kritis, Al-Qur'an Hadis

Abstract

This study aims to analyze the effect of implementing an inquiry-based learning model on students' critical thinking skills in Qur'an Hadith subject for Grade VII students at MTs Swasta Al-Hidayah Patumbak. The study employed a quantitative approach using a quasi-experimental method. The research subjects consisted of 45 students, comprising 22 students from Grade VII A as the experimental class and 23 students from Grade VII B as the control class. Data were collected through pretest and posttest assessments and questionnaires to obtain information regarding students' critical thinking skills. Data analysis included validity, reliability, normality, homogeneity, and hypothesis testing. The results showed that the experimental class obtained a mean pretest score of 77.73 and a posttest mean score of 75.31, while the control class obtained mean pretest and posttest scores of 76.43 and 76.04, respectively. The research instrument was declared valid based on the calculated r -value being greater than the r -table value and reliable with a Cronbach's Alpha coefficient of 0.870. Descriptively, these results indicate that students' critical thinking skills in the experimental class did not improve after the implementation of inquiry-based learning. Therefore, conclusions regarding a significant effect should be based on the results of inferential hypothesis testing.

Keywords: Inquiry-Based Learning, Critical Thinking Skills, Qur'an Hadith

INTRODUCTION

Education in the twenty-first century is no longer sufficiently oriented toward the mastery of knowledge through memorization but must facilitate students' ability to analyze information, evaluate arguments, solve problems, formulate conclusions, and make rational decisions. One of the competencies that has a central position in these demands is critical thinking. Ennis (1996, 2011) conceptualizes critical thinking as a reflective and rational process directed toward determining what to believe or what action to take. Critical thinking therefore involves more than the ability to provide correct answers; it encompasses the capacity to identify problems, examine evidence, assess arguments, interpret information, consider alternative perspectives, and formulate defensible conclusions. Facione (2015) similarly emphasizes that critical thinking involves purposeful judgment based on processes such as interpretation, analysis, evaluation, inference, explanation, and self-regulation. In educational settings, these competencies are essential because students are expected not merely to receive information but to actively examine, question, and construct knowledge through meaningful learning experiences.

The development of critical thinking is particularly important in Islamic education because religious learning requires students to understand not only the textual content of religious teachings but also their meanings, implications, and relevance to everyday life. Qur'an Hadith as a subject in Madrasah Tsanawiyah has considerable potential to facilitate this process because its learning materials are derived from the Qur'an and Hadith, which contain principles of faith, morality, worship, social relations, and guidance for human life. Learning Qur'an Hadith should therefore extend beyond reading, memorizing, and recalling verses or prophetic traditions. Students need opportunities to interpret messages, examine meanings, relate religious texts to contextual problems, and formulate reasoned responses to issues encountered in their environment. Ismail et al. (2024) emphasize the importance of critical thinking skills in Qur'an and Hadith learning, particularly in understanding religious texts and connecting their messages with broader contexts. Consequently, Qur'an Hadith learning can function as an important pedagogical space for developing students' analytical, reflective, and evaluative abilities.

Nevertheless, the potential of Qur'an Hadith learning to develop critical thinking is not always reflected in classroom practice. Learning activities that remain dominated by teacher explanations, direct transmission of information, question-and-answer routines, and memorization may position students primarily as recipients of knowledge. Such teacher-centered practices can restrict opportunities for students to formulate questions, investigate problems, evaluate evidence, compare interpretations, and develop independent conclusions. The distinction between teacher-centered and learner-centered learning is particularly important in this context because active participation provides students with greater opportunities to construct knowledge through interaction, investigation, and reflection (Mujahida & Rus'an, 2019). Sanjaya (2006) argues that effective learning strategies should provide meaningful opportunities for students to engage actively in the learning process rather than merely receive

information from teachers. This indicates the need for a learning approach capable of shifting students from passive recipients toward active investigators of knowledge.

One approach that is conceptually relevant to this need is inquiry-based learning. Inquiry-based learning places students at the center of a systematic process of investigation in which they identify problems, formulate questions, collect relevant information, analyze evidence, test possible explanations, and draw conclusions. Gulo (2002) explains that inquiry learning involves students maximally in systematic, critical, logical, and analytical investigation to discover answers to problems. Pedaste et al. (2015) further explain that inquiry-based learning can be understood through a cycle consisting of orientation, conceptualization, investigation, conclusion, and discussion. This structure creates a learning environment in which students are encouraged to question information, investigate evidence, develop explanations, and reflect upon their findings. Such processes have a direct conceptual relationship with critical thinking because students are continuously required to analyze information, evaluate evidence, make inferences, and justify their conclusions.

Empirical studies have also demonstrated the potential of inquiry-based learning to enhance critical thinking. Minner et al. (2010), through a research synthesis, found that inquiry-oriented science instruction can contribute positively to students' learning when students are actively involved in investigating questions and constructing explanations. Furtak et al. (2012) similarly reported positive effects of inquiry-based science teaching, particularly when inquiry activities are appropriately structured. Lazonder and Harmsen (2016), through a meta-analysis, further demonstrated that inquiry-based learning becomes more effective when students receive adequate guidance during the inquiry process. These findings indicate that inquiry should not be understood simply as allowing students to learn independently, but as a structured pedagogical process in which teachers provide appropriate scaffolding while maintaining students' active intellectual involvement. More recent evidence strengthens this argument. Sari et al. (2023) found a positive effect of guided inquiry on students' critical thinking skills, while Arifin et al. (2025) reported through a systematic review and meta-analysis that inquiry-based learning has a significant contribution to the development of students' critical thinking skills. Harapan et al. (2026) likewise confirmed the relationship between inquiry-based learning and critical thinking through a meta-analysis that considered variations in control groups.

The relevance of inquiry-based learning is also increasingly evident within Islamic education. Solichin (2017) demonstrated that inquiry-discovery learning in Islamic Religious Education provides students with opportunities to formulate problems and discover answers through active thinking processes. Asror (2022) similarly highlighted the implementation of inquiry methods in Islamic Religious Education as an alternative to conventional instructional practices. Saharani et al. (2024) specifically found that inquiry learning can support the development of students' critical and creative thinking in Islamic Religious Education. More recently, Nabillah et al. (2025) developed an inquiry learning model in Islamic Religious Education specifically to improve students' critical thinking skills. Sari et al. (2025) also reported evidence from a meta-analysis concerning the contribution of HOTS-oriented inquiry learning to

critical thinking in Islamic Religious Education. These studies demonstrate that inquiry has substantial potential within Islamic educational contexts; however, much of the existing research has examined Islamic Religious Education in general rather than focusing specifically on Qur'an Hadith as a distinct subject.

This gap is important because Qur'an Hadith possesses particular characteristics that distinguish it from general Islamic Religious Education. The subject requires students to engage simultaneously with religious texts, meanings, interpretation, contextual understanding, and practical application. Therefore, critical thinking in Qur'an Hadith cannot be reduced to general problem-solving skills but should involve the ability to examine religious information, understand textual messages, relate them to contextual realities, evaluate interpretations, and formulate responsible conclusions. Although Ismail et al. (2024) have highlighted the importance of critical thinking in Qur'an and Hadith learning, empirical studies examining the direct effect of inquiry-based learning on students' critical thinking within this specific subject and at the Madrasah Tsanawiyah level remain limited. This creates an important research space for investigating whether inquiry-based learning can produce measurable improvements in students' critical thinking when applied specifically to Qur'an Hadith instruction.

The present study therefore focuses on the implementation of inquiry-based learning among seventh-grade students in Qur'an Hadith at Madrasah Tsanawiyah Swasta Al-Hidayah Patumbak. The study is positioned not merely to introduce an alternative teaching method but to empirically examine the extent to which inquiry-based learning contributes to the improvement of students' critical thinking. The significance of this investigation lies in connecting a student-centered instructional model with the specific epistemological and pedagogical characteristics of Qur'an Hadith learning. Through inquiry activities, students are expected to move from receiving religious information toward actively questioning, investigating, interpreting, evaluating, and drawing conclusions from the learning materials. The inquiry process thus provides a potential bridge between religious knowledge and critical intellectual engagement.

Based on this context, the study is important both theoretically and practically. Theoretically, it contributes to the growing body of literature concerning active and inquiry-oriented learning in Islamic education by providing empirical evidence from the specific context of Qur'an Hadith at the Madrasah Tsanawiyah level. Practically, the findings may provide Qur'an Hadith teachers with an evidence-based alternative for designing learning activities that encourage students to become more active, analytical, reflective, and independent learners. Accordingly, this study aims to determine the effect of implementing inquiry-based learning on the improvement of critical thinking skills among seventh-grade students in Qur'an Hadith at Madrasah Tsanawiyah Swasta Al-Hidayah Patumbak. The study is expected to demonstrate that Qur'an Hadith learning can move beyond the transmission and memorization of religious knowledge toward a learning process that cultivates students' capacity to understand religious teachings critically, reflectively, and responsibly.

METHOD

This study employed a quantitative approach with a quasi-experimental design to examine the effect of inquiry-based learning on students' critical thinking skills in Qur'an Hadith. A quantitative approach was selected because the research data were expressed as numerical scores and analyzed statistically to test the proposed hypothesis (Sugiyono, 2022). The research used a non-equivalent control group design, involving an experimental group that received inquiry-based learning and a control group that received conventional instruction. The quasi-experimental design was selected because the researcher could not randomly assign individual students, as the research subjects were organized into existing classroom groups (Sukardi, 2023).

The study was conducted at Madrasah Tsanawiyah Swasta Al-Hidayah Patumbak, Patumbak District, Deli Serdang Regency, during the first semester of the 2025/2026 academic year. The population consisted of all seventh-grade students, comprising 22 students in class VII A and 23 students in class VII B, with a total of 45 students. Because the population was relatively small, a saturated sampling technique was employed, allowing all students to participate as research subjects. Class VII A was assigned as the experimental group, while class VII B served as the control group. The existing classroom structure was maintained to avoid disrupting the school's regular learning activities.

Data were collected through tests, questionnaires, and documentation. The primary instrument was an essay-based critical thinking test administered before and after the treatment through pre-test and post-test procedures. The test items were developed based on critical thinking indicators, including identifying problems, analyzing information, providing arguments, evaluating information, and drawing conclusions. Instrument development followed established principles of educational assessment to ensure that each item represented the intended construct (Mardapi, 2012). Questionnaires were used as supporting data to obtain information concerning students' responses to the learning process, while documentation provided supporting information regarding student numbers, instructional materials, and research implementation.

The research procedure consisted of three stages. First, both groups completed a pre-test to determine their initial critical thinking abilities. Second, the experimental group received inquiry-based learning through problem orientation, question formulation, information gathering and analysis, answer testing, and conclusion drawing. Meanwhile, the control group studied the same Qur'an Hadith materials through conventional instruction. Third, both groups completed a post-test to identify changes in their critical thinking skills following the treatment.

Before implementation, the research instrument was tested for validity and reliability. Content validity was established through expert judgment, while empirical validity was examined using the Product Moment correlation. Reliability was assessed using Cronbach's Alpha to determine the instrument's internal consistency (Sugiyono, 2022). Data analysis included descriptive and inferential statistics. Learning improvement was examined using N-Gain, while differences between the experimental and control groups were tested using an independent-samples t-test after the relevant statistical assumptions had been fulfilled. The results were used

to determine whether inquiry-based learning had a statistically significant effect on the critical thinking skills of seventh-grade students in Qur'an Hadith.

RESULTS AND DISCUSSIONS

Initial Conditions and Instrument Quality in Measuring Students' Critical Thinking Skills

The results of the study indicate that the initial critical thinking abilities of students in the experimental and control groups were relatively comparable before the implementation of the inquiry-based learning intervention. The experimental class, consisting of 22 students, obtained a mean pretest score of 77.73, while the control class, consisting of 23 students, obtained a mean pretest score of 76.43. The difference of only 1.30 points suggests that the two groups started from relatively similar conditions. This initial similarity is important in a quasi-experimental study because it provides a reasonable basis for examining changes that occur after different instructional treatments are implemented. Critical thinking itself should not be understood merely as the ability to provide correct answers, but as a multidimensional capacity involving interpretation, analysis, evaluation, inference, explanation, and reflective judgment. Ennis (1996, 2011) emphasizes that critical thinking involves reflective and reasoned judgment concerning what should be believed or done, while Facione (2015) highlights the importance of analytical and evaluative processes in critical thinking.

The quality of the research instruments was also examined before the data were used for further analysis. The critical thinking test consisted of 20 items, and all items were found to be valid because their calculated correlation coefficients exceeded the critical value of 0.294. The reliability test produced a Cronbach's Alpha coefficient of 0.870, indicating a high level of internal consistency. The questionnaire used as supporting data regarding students' responses to inquiry-based learning also demonstrated acceptable measurement quality. All questionnaire items were declared valid, while its Cronbach's Alpha coefficient reached 0.862. These results indicate that the instruments were sufficiently reliable for measuring the variables investigated in the study. The importance of using reliable instruments is particularly relevant in critical thinking research because critical thinking involves several interrelated cognitive dimensions and cannot be adequately represented through superficial measures alone. Facione et al. (2000) similarly explain that critical thinking dispositions and skills involve distinguishable but related dimensions that require appropriate measurement.

The assumptions for inferential statistical analysis were subsequently examined. The normality test indicated that the pretest and posttest data generally met the assumption of normality, as the Shapiro-Wilk significance values were greater than 0.05. The posttest data of the control group also produced a significance value of 0.071, which remained above the 0.05 threshold. In addition, the homogeneity test produced a significance value of 0.366, indicating that the posttest variances of the experimental and control groups could be considered

homogeneous. Therefore, the data fulfilled the basic assumptions required for the application of parametric statistical procedures.

These findings establish an adequate methodological foundation for comparing the two groups. However, the similarity of the initial scores and the validity of the instruments do not, by themselves, demonstrate the effectiveness of inquiry-based learning. The determination of whether inquiry-based learning significantly affects students' critical thinking must be based on subsequent inferential analysis. This distinction is important because critical thinking development depends not only on the instructional model but also on the quality, duration, implementation, and measurement of the learning experience (Abrami et al., 2008, 2015).

Changes in Critical Thinking Scores Following Inquiry-Based Learning

The descriptive results reveal an unexpected pattern in the development of students' critical thinking skills after the instructional intervention. Although the experimental class received inquiry-based learning, its mean score decreased from 77.73 in the pretest to 75.31 in the posttest. This represents a decrease of 2.42 points. Meanwhile, the control class experienced a much smaller decrease, from 76.43 in the pretest to 76.04 in the posttest, representing a reduction of only 0.39 points. Consequently, the posttest mean of the control class, 76.04, remained slightly higher than that of the experimental class, 75.31. Based solely on these descriptive statistics, therefore, the results do not provide evidence that inquiry-based learning produced a greater improvement in students' critical thinking skills than conventional instruction.

This finding should be interpreted carefully rather than immediately concluding that inquiry-based learning is ineffective. Previous research has generally demonstrated that inquiry can support the development of higher-order thinking, but its effectiveness is influenced by several contextual and instructional factors. Furtak et al. (2012), for example, found positive effects of inquiry-based science teaching in experimental and quasi-experimental studies, while Minner et al. (2010) reported that inquiry-oriented instruction can contribute to improved conceptual understanding when students are actively engaged in learning. More recent evidence also indicates that inquiry-based learning has potential for strengthening critical thinking, although the magnitude of its effect may vary according to instructional conditions and research contexts (Arifin et al., 2025; Harapan et al., 2026).

One possible explanation for the findings in the present study is students' adjustment to a different learning structure. Students who are accustomed to teacher-centered instruction may initially experience difficulties when they are required to formulate questions, investigate information, discuss evidence, evaluate possible answers, and formulate conclusions. Mughaida and Rus'an (2019) explain that the shift from teacher-centered to learner-centered learning changes students' position from passive recipients of information to active participants in constructing knowledge. Such a transition may require time and appropriate instructional support.

The role of teacher guidance is particularly important in this context. Inquiry does not automatically generate critical thinking simply because students are asked to investigate a problem. Lazonder and Harmsen (2016) demonstrated through meta-analysis that guidance has an important influence on the effectiveness of inquiry-based learning. Without sufficient scaffolding, students may face excessive cognitive demands, misunderstand the learning objectives, or focus on collecting information without critically evaluating it. Pedaste et al. (2015) describe inquiry as a cyclical process involving orientation, conceptualization, investigation, conclusion, and discussion. Each stage requires appropriate guidance so that students do not merely perform activities but engage meaningfully in the reasoning processes underlying inquiry.

The results therefore suggest that the implementation of inquiry in this study had not yet produced a descriptive increase in critical thinking scores. Nevertheless, the finding should not be interpreted as evidence that inquiry is inherently unsuitable for Qur'an Hadith learning. Rather, it indicates that the effectiveness of inquiry may depend on how the model is implemented, the extent of teacher guidance, students' prior learning habits, and the duration of the intervention. Meta-analytic evidence from Abrami et al. (2015) similarly shows that critical thinking can be developed through instructional interventions, but effective implementation requires explicit opportunities for students to practice reasoning and reflection.

The Relevance and Implementation of Inquiry-Based Learning in Qur'an Hadith Instruction

The findings of this study demonstrate that inquiry-based learning has conceptual relevance to Qur'an Hadith instruction, even though the descriptive data do not show an increase in students' critical thinking scores. Qur'an Hadith learning requires students not only to remember verses, hadith, meanings, and religious concepts but also to understand messages, examine relationships between religious texts and real-life situations, provide reasons, and draw conclusions based on evidence. Ismail et al. (2024) emphasize that critical thinking in Qur'an and Hadith learning involves deeper understanding, contextual analysis, critical interpretation, and the ability to connect Islamic teachings with contemporary realities. These characteristics are consistent with the fundamental orientation of inquiry-based learning.

Inquiry provides opportunities for students to become actively involved in the construction of knowledge. Rather than receiving complete explanations from the teacher, students can be presented with problems or situations related to the content of Qur'an Hadith, encouraged to formulate questions, identify relevant information, compare interpretations, discuss possible explanations, and formulate conclusions. Gulo (2002) and Sanjaya (2006) position inquiry as an instructional approach that emphasizes student activity and the process of discovering answers through systematic investigation. Solichin (2017) similarly demonstrates the relevance of inquiry-discovery learning to Islamic Religious Education because it creates opportunities for students to formulate problems and develop answers through active cognitive processes.

However, the present findings suggest that the inquiry process needs to be carefully adapted to the characteristics of seventh-grade students. Rather than implementing unrestricted or free inquiry, guided inquiry may be more appropriate. In guided inquiry, teachers continue to provide learning stimuli, formulate contextual problems, provide relevant learning resources, offer guiding questions, and monitor students' investigation, while students remain responsible for analyzing information and constructing conclusions. Sari et al. (2023) found through meta-analysis that guided inquiry has potential to improve students' critical thinking skills. The importance of guidance is also supported by Lazonder and Harmsen (2016), who found that inquiry learning is more effective when students receive appropriate forms of instructional support.

The results are also consistent with research in Islamic education. Asror (2022) demonstrates the relevance of inquiry methods in Islamic Religious Education, while Saharani et al. (2024) specifically associate inquiry-based learning with the development of students' critical and creative thinking. Nabillah et al. (2025) further indicate the potential of inquiry learning in Islamic Religious Education for strengthening students' critical thinking. In addition, Sari et al. (2025) show that inquiry-oriented learning combined with higher-order thinking principles can contribute to critical thinking development in Islamic Religious Education. These studies reinforce the argument that inquiry has pedagogical potential within Islamic education, although its implementation must be responsive to students' characteristics and learning contexts.

Accordingly, the central finding of this study is not that inquiry-based learning has been proven to significantly improve critical thinking, because the available descriptive data do not support such a conclusion. Instead, the findings demonstrate that inquiry represents a theoretically and pedagogically relevant approach whose effectiveness requires confirmation through inferential statistical testing. The difference between pretest and posttest means should therefore be complemented by an independent-samples t-test or an analysis of gain scores. If the inferential test produces a significance value below 0.05, the study may conclude that a statistically significant difference exists between the groups. Conversely, if the significance value exceeds 0.05, the hypothesis of a significant effect should not be accepted. This cautious interpretation is consistent with the broader evidence that instructional interventions for critical thinking are most effective when they provide explicit opportunities for reasoning, argumentation, evaluation, and reflection (Abrami et al., 2008, 2015). Thus, future implementation of inquiry in Qur'an Hadith learning should emphasize guided investigation, contextual problems, structured questioning, evidence-based discussion, and reflective conclusions so that students are not merely active in classroom activities but also actively engaged in critical thinking.

CONCLUSIONS

This study examined the implementation of inquiry-based learning and its potential influence on the critical thinking skills of seventh-grade students in Qur'an Hadith at Madrasah Tsanawiyah Swasta Al-Hidayah Patumbak. The findings indicate that the experimental and

control groups had relatively comparable initial abilities, with mean pretest scores of 77.73 and 76.43, respectively. The research instruments demonstrated adequate validity and high reliability, while the normality and homogeneity tests confirmed that the data met the basic assumptions for further parametric analysis. However, the descriptive results did not demonstrate an improvement in the experimental group. The mean score decreased from 77.73 in the pretest to 75.31 in the posttest, while the control group decreased slightly from 76.43 to 76.04. Therefore, based on the available descriptive data, inquiry-based learning cannot yet be claimed to have significantly improved students' critical thinking skills. Nevertheless, inquiry-based learning remains pedagogically relevant to Qur'an Hadith instruction because its stages encourage students to formulate questions, investigate information, analyze evidence, discuss alternatives, and construct conclusions. The findings suggest that successful implementation requires appropriate teacher guidance, contextual learning problems, structured questioning, and sufficient learning time. Ultimately, the effectiveness of inquiry should be determined through inferential statistical testing rather than descriptive comparisons alone.

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