



Does the Discovery Learning Model Improve Students' Critical Thinking Skills in Islamic Education? Experimental Study

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Article Info	Abstract
Article History Received: 2025-11-05 Revised: 2025-12-19 Published: 2026-01-16 Keywords: <i>21st Century Skills; Discovery Learning Model; Learning Innovation; Rukhsah Material.</i>	Critical thinking is one of the most valuable skills that the education system can develop in students. In fact, critical thinking skills among students in Indonesia are still relatively low. Choosing the right learning model also helps students understand the material being studied, thereby empowering their critical thinking skills. The purpose of this study was to determine the effect of applying the discovery learning model on improving the critical thinking skills of JHS students in Islamic Education. This research is a quasi-experimental study using a pretest-posttest control group model. The research was conducted at JHS 1 Buay Madang Timur May-June 2025. The research population consisted of seventh-grade JHS students, and the research sample consisted of seventh-grade students in class VII F (experimental group) and class VII G (control group). Data collection techniques for critical thinking skills were conducted using tests. The instruments used were valid and reliable essay questions. The research data were analyzed using descriptive quantitative analysis and an independent sample t-test. The results of the independent sample t-test Sig. (2-tailed) value of $0.00 < 0.05$, indicating a significant difference in post-test critical thinking skills between the experimental and control groups.

Artikel Info	Abstrak
Sejarah Artikel Diterima: 2025-11-05 Direvisi: 2025-12-19 Dipublikasi: 2026-01-16 Kata kunci: <i>Inovasi Pembelajaran; Keterampilan Abad 21; Materi Rukhsah; Model Discovery Learning.</i>	Kemampuan berpikir kritis salah satu kemampuan yang sangat berharga yang dapat dikembangkan oleh sistem pendidikan pada siswa. Faktanya kemampuan berpikir kritis siswa di Indonesia masih relatif rendah. Pemilihan model pembelajaran yang tepat juga membantu pemahaman siswa terhadap materi yang pelajari sehingga dapat memberdayakan kemampuan berpikir kritis siswa. Tujuan penelitian ini yaitu mengetahui pengaruh penerapan model discovery learning untuk meningkatkan kemampuan berpikir kritis siswa SMP pada pembelajaran PAI. Jenis penelitian ini yaitu penelitian eksperimen semu dengan model Pretest-Posttest Control Group. Penelitian dilakukan di SMPN 1 Buay Madang pada Bulan Mei-Juni 2025. Populasi penelitian adalah siswa SMP kelas VII dan sampel penelitian siswa kelas VII F (kelompok eksperimen) dan siswa kelas VII G (kelompok kontrol). Teknik pengumpulan data data kemampuan berpikir kritis dengan tes. Instrumen yang digunakan yaitu instrumen soal essay yang valid dan reliabel. Data hasil penelitian dianalisis deskriptif kuantitatif dan uji independent sample t-test. Hasil uji independent sample t-test memperoleh nilai Sig. (2-tailed) $0,00 < 0,05$ artinya terdapat perbedaan nilai post-test kemampuan berpikir kritis siswa pada kelompok eksperimen dan kontrol.

I. INTRODUCTION

Facing the challenges of the 21st century, students need to be equipped with several skills, one of which is critical thinking. Critical thinking is recognized as one of the most essential thinking skills and one of the most important indicators of the quality of student learning. Critical thinking is essential for individuals to live, work, and function effectively in society. Almost all professions, including education, engineering, management, medicine, finance, politics, and law, require the ability to think critically about individuals, as clear and rational thinking is necessary to solve problems systematically (Chusni et al., 2020). This skill is

very important for students because the process involves several abilities such as the ability to estimate, analyze, synthesize, evaluate, and reason (Zulyusri et al., 2023; Song et al., 2024). According to Setiadi and Elmawati (2019) The objective of developing critical thinking skills in students is to achieve a deep understanding that leads to long-term sustainable learning.

Critical thinking is one of the most valuable skills that the education system can develop in students. It is important to note that we are not born as critical thinkers; therefore, we must develop this skill over time and through practice (O'Reilly, Devitt and Hayes, 2022). The facts on the ground show that students' critical thinking

skills in Indonesia are still relatively low. For example, research by Lestari, Ahmadi and Rochmad (2021) that elementary school students' critical thinking skills are also still low. In addition to elementary school students, the results of research by Azmi et al. (2022) that the critical thinking skills of junior high school students in Palembang, South Sumatra are still relatively low in all indicators, with an average percentage below 50%. The results of a study by Dwi, Akhsan and Marlina (2024) that the critical thinking skills of high school students in North Sumatra are also still low. Furthermore, a survey by that the critical thinking skills of students at several universities in the Sumatra region are also still low (Tampubolon and Sipahutar, 2024). Based on findings obtained from previous studies, it was revealed that critical thinking skills at the elementary to university levels in Sumatra still need to be developed.

Field observations at one school in South Sumatra, namely JHS 1 Buay Madang Timur, Palembang, with an Islamic Education teacher, revealed that in the Islamic Education learning process, many students still received scores below the minimum passing grade on daily tests. In addition, during the Islamic Education learning process, students also tend to be passive and lack enthusiasm for participating in the learning process. This finding is also reinforced by interviews with several students in grades VII F and VII G, who stated that they were bored with the teacher's teaching methods in Islamic Education, which consisted only of lectures and summarizing assignments. These findings were also reinforced by interviews with Islamic Education teachers, who said that the methods used by teachers were generally lectures and worksheets. The questions given by teachers to students were generally questions from worksheets or textbooks. Teachers have not yet compiled their questions to give to students, so students are not accustomed to answering critical thinking questions.

According to Primadoniati (2020) and Sabarudin et al. (2023) in Islamic education, there is still a strong emphasis on reasoning or memorization, which significantly influences the attitudes that children will develop. Memorization certainly has its uses, but if all subjects must be memorized, it will produce students who are less creative and afraid to express their own opinions. Therefore, it is not surprising that students become lazy and unmotivated in this subject. Research results by Nadhiroh and Anshori (2023) that students who

have low attention and are unmotivated in Islamic Education are also one of the causes of low critical thinking skills. Similar findings by Raito and Dewi (2023) one of the causes of low critical thinking skills among students in Islamic Education is low concentration and lack of motivation in learning due to monotonous teaching methods. In addition, low critical thinking skills among students can also be influenced by teachers who still use conventional teaching models and choose inappropriate teaching models (Solissa et al., 2023). Therefore, there is a need for a student-centered learning model that is not always centered on the educator. Learning must also be adapted to learning models that are relevant to 21st-century learning. The selection of a learning model is essential for increasing or strengthening student motivation to learn. According to Satwika, Laksmiwati and Khoirunnisa (2018) Choosing the right learning model also helps students understand the material being studied. A good learning model can motivate students to achieve learning objectives, thereby empowering their critical thinking skills (Manurung and Pappachan, 2025).

According to Putri, Bukit and Simanjuntak (2021) critical thinking skills can be achieved by implementing innovative learning methods in line with learning activities, such as designing learning that is closely related to reality and student-centered. One way to do this is by applying the discovery learning model (Novita, Asrori and Rusman, 2022; Afiuwah, Susanti and Purwandari, 2024). Research results by Iyasa, Aisah and Firdaus (2023) that the application of the discovery learning model in Islamic Education, particularly in teaching students at vocational high schools about preparing the deceased for burial, can improve students' critical thinking skills. Findings by Ningsih and Santani (2025) Through a literature review, it was found that the application of the discovery learning model had a positive effect on improving students' critical thinking skills in Islamic Education. Findings by Syaifullah and Maulidiyah (2024) that the application of the discovery learning model has the potential to improve students' critical thinking skills. Finally, findings by Tarmizi (2021) the implementation of the discovery learning model effectively improved the critical thinking skills of students at JHS 4 Loksumawe with a completion rate of 94%.

The discovery learning model provides several advantages in learning, especially in Islamic Education. For example, this model

encourages students to explore concepts through the direct discovery of new knowledge rather than direct transmission from educators. This model encourages active and independent inquiry that involves students cognitively and behaviorally in the learning process (Ismail et al., 2024). Discovery learning is a widely recommended learning strategy because this method can improve students' learning methods (Yenti, Ramadhanti and Laila, 2022). Students make discoveries and teachers guide them in doing so, so this model encourages students to learn independently. Therefore, in learning, students are required to be able to think critically in answering various problems presented (Nursakinah and Suyanta, 2023).

Based on the findings obtained show that the critical thinking skills of students in Islamic Education, including at JHS 1 Buay Madang Timur, still need to be empowered. Improving critical thinking skills has become an obligation for educators; educators should design learning to train the abilities and skills needed by students in the future. One of the efforts made is to apply the discovery learning model. Several previous studies have found that the discovery learning model is efficacious in improving students' critical thinking skills in each step of this learning model. Previous findings also show that in Islamic Education for junior high school, senior high school, and vocational high school students, this model is efficacious in improving critical thinking skills. However, there is still minimal research on Islamic Education learning that applies the discovery learning model to Rukhsah material for seventh-grade students in the Merdeka Curriculum. In addition, interview results also show that teachers have not yet applied the discovery learning model at JHS 1 Buay Madang Timur. Therefore, it is essential to conduct this study to improve the critical thinking skills of seventh-grade students on Rukhsah material by applying the discovery learning model.

II. METHOD

1. Research Type

The type of research used in this study was quasi-experimental research with a pretest-posttest control group model (Table 1). This study aimed to determine the effect of the discovery learning model on the critical thinking skills of seventh-grade JHS students in Islamic Religious Education (Islamic Education) lessons. The research was conducted at JHS 1 Buay Madang Timur, Oku

Timur, South Sumatra, Indonesia in May-June 2025.

Table 1. Research Design

Group	Pretest	Treatment	Posttest
Experiment	O1	X	O2
Control	O3	-	O4

Explanation:

O1: Pre-test results of critical thinking skills in the experimental group

O2: Post-test results of critical thinking skills in the experimental group

O3: Pre-test results of critical thinking skills in the control group

O4: Post-test results of critical thinking skills in the control group

X: Learning with the discovery learning model

- : Conventional learning with a teacher

2. Research Subject

The population involved in this study were students in grades VII A-VII H at JHS 1 Buay Madang Timur, totaling 272 students (1 class with 34 students). The sample involved in the study were students in grade VII F, totaling 27 students, and grade VII G, totaling 33 students. Grade VII F in this study was the experimental group, and grade VII G in this study was the control group. The sampling technique used in this study was purposive sampling. The basis for sample selection was determined based on the researcher's initial observations and suggestions from subject teachers who understand the students' characteristics and daily lives.

This research was conducted with due regard to ethical research principles. Prior to conducting the research, the researcher first obtained and obtained official permission from the school. After obtaining permission, the researcher clearly explained the objectives and procedures of the research to the students before the research activity began. The research process was carried out during Islamic Religious Education class hours, not outside of school hours, with the consideration that the rukhsah material had not been taught by the teacher so as not to disrupt the previous learning process. The researcher also guarantees that all student personal data is kept confidential and is not included in the research article.

3. Research Procedures

In general, this research procedure is divided into three main stages, namely the preparation stage, the implementation stage, and the reporting stage (Table 2).

Table 2. Research Procedures

Stage	Description
Preparation	The research preparation stage includes field needs analysis, which in this study was conducted through interviews with classroom teachers and school principals. The results of these interviews were used as material for formulating relevant solutions, namely the application of the discovery learning model to improve students' abilities in rukhsah material. In addition, at this stage, preparations were also made for the development of learning tools for the experimental group and research instruments. The instruments prepared at this stage include pre-test and post-test instruments for critical thinking skills. In addition, at this stage, critical thinking instruments were also tested, and the test results were used as material for analyzing the quality of the instrument items to obtain valid and reliable instruments. These valid and reliable instruments were used as research instruments to measure the critical thinking skills of students in the experimental and control groups.
Implementation	The research implementation stage is carried out if the learning tools have been completed and the critical thinking skills instruments are valid and reliable. Learning is divided into two groups, namely the experimental and control groups. Learning in the two groups is carried out within 1 month. Learning in the experimental group uses the discovery learning model, while the control group uses the learning model commonly used by Islamic Education teachers at JHS 1 Buay Madang Timur. The learning process began with a pre-test, followed by learning activities in accordance with the learning scenario outlined in the teaching module. After the learning activities were completed, a post-test was administered to both groups. Finally, the learning process was repeated for the experimental group.
Reporting	The reporting stage involved processing the research results to answer the hypothesis of this study.

4. Data Collection Techniques and Instruments

The data in this study is data on students' critical thinking skills. The data collection technique for critical thinking skills was conducted using a test technique. The test data were collected using critical thinking essay questions. The essay questions used in this study consisted of nine questions that referred to critical thinking skills indicators by

Ennis. The questions used were tested on 57 seventh-grade students at JHS 1 Buay Madang, and the results of the test were analyzed to obtain valid and reliable questions. Out of the 10 questions developed, 9 were found to be valid in this study, with a reliability value of 0.702, indicating a high level of reliability for the critical thinking skills instrument (Table 3). Validity testing was conducted using Pearson product-moment correlation and Cronbach's alpha, assisted by SPSS 27 software.

Table 3. Instrument Item Validity Results

Pre-Test	Item		Sig value (2-tailed)	Decision
	Post-Test			
1	10		0,000	Valid
2	9		0.000	Valid
3	8		0.000	Valid
4	7		0.000	Valid
5	6		0.001	Valid
6	4		0.000	Valid
7	5		0.000	Valid
8	1		0.000	Valid
9	2		0.000	Valid
10	3		0.061	Invalid

5. Data Analysis Techniques

Pre-test and post-test data on critical thinking skills in rukhsah material were analyzed using descriptive statistics to obtain the average critical thinking skills score and inferential statistics using an independent sample t-test to determine the effect of the discovery learning model on improving the critical thinking skills of seventh grade students at JHS 1 Buay Madang Timur. This test is a parametric statistical test; therefore, there are prerequisites that must be met, namely that the data is normally distributed and homogeneous. If the research data does not meet the prerequisites, a non-parametric test, namely the Mann-Whitney test, can be used. The basis for deciding to use the independent sample t-test is as follows (Table 4).

Table 4. Research Hypothesis

Significance value	Research Hypothesis
Sig value > 0.05	H0 accepted and Ha rejected
	There is no effect of the application of the discovery learning model on the critical thinking skills of seventh grade students at JHS 1 Buay Madang Timur in Islamic Education
Sig value < 0.05	Ha accepted and H0 rejected
	There is an effect of the application of the

discovery learning model on the critical thinking skills of seventh grade students at JHS 1 Buay Madang Timur in Islamic Education

III. RESULT AND DISCUSSION

A. Result

The implementation of Islamic Education learning in the experimental group using the discovery learning model in this study was conducted over 1 month or 4 meetings. Learning in the control group was also conducted over 1 month. Learning in both groups was conducted from May 15 to June 10, 2025. Before starting the learning process in the experimental and control groups, the researcher administered a pre-test to measure students' critical thinking skills (initial). After completing the entire learning process, the researcher administered a post-test to measure students' critical thinking skills (final) after receiving the treatment.

1. Descriptive Data on Critical Thinking Skills

The results of the study in Table 5 show that the minimum pre-test score of students in the experimental group was 40, and the maximum score was 70. Furthermore, in the post-test data, the experimental group obtained a minimum score of 78 and a maximum of 100. The average pre-test score in the experimental group obtained a score of 57, while the average post-test score obtained an average of 90. Furthermore, in the control group, the results of the study in Table 5, the minimum pre-test score was 33 and the maximum was 73. The average pre-test score in the control group was 51. Furthermore, in the post-test data, the minimum score was 63, and the maximum was 93. The average pre-test score in the control group was 51, and the average post-test score obtained an average of 78.

Table 5. Description of Critical Thinking Skills Data

Group	Value	Minimum	Maximum	Average	N
Experiment	Pre-Test	40	70	57	27
	Post-Test	78	100	90	27
Control	Pre-Test	33	73	51	33
	Post-Test	63	93	78	33

2. Research Hypothesis Testing

The results of the normality test of the pre-test and post-test data of the experimental group and the control group in Table 6 obtained a significance value > 0.05 , meaning that the pre-test and post-test data of the critical thinking skills of students in the experimental and control groups were univariate and normally distributed.

Table 6. Results of the Normality Test of Critical Thinking Ability Data

Group	Statistic	df	Sig.	Decision
Pre-test (Experimental Group)	.925	27	.053	Normal
Post-test (Experimental Group)	.950	27	.212	Normal
Pre-test (Control Group)	.954	33	.176	Normal
Post-test (Control Group)	.946	33	.102	Normal

The homogeneity test results of critical thinking skills data based on the mean in Table 7 obtained a significance value of $0.127 > 0.05$. These results indicate that the data originated from the same variance (homogeneous). Based on the results of the univariate prerequisite test, the critical thinking skills data in this study meet the univariate prerequisite test, namely, normal distribution and homogeneity. Therefore, the data was subjected to a hypothesis test using an independent sample t-test.

Table 7. Results of Homogeneity Test of Critical Thinking Ability Data

Levene Statistic	df1	df2	Sig.	
Based on Mean	1.942	3	116	.127
Based on Median	1.778	3	116	.155
Based on Median and with adjusted df	1.778	3	105.602	.156
Based on trimmed mean	1.941	3	116	.127

The results of the independent sample t-test in Table 8 obtained a Sig. (2-tailed) value of $0.00 < 0.05$, meaning that there was a difference in the post-test scores for critical thinking skills between the experimental and control groups. These results indicate that the application of the discovery learning model was practical in improving the critical thinking skills of seventh-grade junior high school students in the subject of rukhsah in Islamic Education. These results are further supported by the descriptive research

findings in Table 5, which show that the average post-test scores in the experimental group were higher than those in the control group. Additionally, the difference between the pre-test and post-test average scores in the experimental group was also greater.

Table 8. Independent Sample T-Test Results

	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Equal variances assumed	58	.000	12.08754	1.86609	8.35216	15.82292
Equal variances not assumed	56.917	.000	12.08754	1.80401	8.47496	15.70012

B. Discusson

The results of the study in Tables 5 and 8 indicate that the application of the discovery learning model is efficacious in improving the critical thinking skills of seventh-grade students at JHS Buay Madang Timur in Islamic Education, particularly in the material on rukhsah. The average pre-test and post-test scores of the experimental class were higher than those of the control class (Table 3). The findings of this study are relevant to previous studies Syafriadi (2024) the application of the discovery learning model in Islamic education in senior high schools can improve students' critical thinking skills. The results of research by Novita, Asrori and Rusman (2022) that the application of the discovery learning model in Islamic Education for high school students in private schools is 85% effective in improving students' critical thinking skills. Furthermore, the results of research by Samsul, Ferdinan and Rajjah (2024) that packaging Islamic Education learning at the junior high school level using the discovery learning model is effective in improving students' critical thinking skills. In addition, at the Madrasah Tsanawiyah level, findings by Najwa (2025) the discovery learning model in Fiqh material is effective in improving students' critical thinking skills. Finally, at the elementary school level, the discovery learning model in Fiqh material is also effective in improving students' critical thinking skills at Madrasah Ibtidaiyah (Zubaedi, 2025) and effective in improving critical thinking skills among students at Sampang Madura Public Elementary School, with a success rate of 72%

in cycle 1 and 86% in cycle 2 (A'yunin, Soraya and Hamdani, 2022).

The results obtained from previous studies show that the application of the discovery learning model has a positive effect on achieving learning objectives, thereby improving students' critical thinking skills. Through the application of the discovery learning model in Islamic Education learning, students will learn to think and try to solve problems on their own, which can then be applied in their social lives, especially from the perspective of Islamic values (Khasanah et al., 2017). According to Wahyuningtyas and Widiyono (2024) Developing critical thinking skills in Islamic Education involves not only cognitive abilities but also knowledge of Islamic principles and morality. Within the framework of Islamic education, critical thinking encompasses not only intellectual capacity but also the ability to evaluate and test moral principles, justice, and ethics in everyday life. Therefore, students can make wise and responsible decisions in accordance with Islamic teachings.

The discovery learning model is one of the appropriate learning models to improve students' critical thinking skills and focuses more on the discovery of concepts from previously unknown knowledge or information and student-centered learning (Anwar, Slamet and Daniaty, 2023). In implementing the discovery learning model on the subject of rukhsah, the researcher, as a classroom teacher, designed Islamic Education lessons so that students could discover the application of the concept of rukhsah in their daily lives, for example in prayer, fasting, and the hajj. For example, in the first step of the discovery of learning syntax, namely stimulus, the researcher asked students to understand the discourse containing the application of the concept of rukhsah in life (Table 9). The presentation of the text containing the application of rukhsah values aims to provide initial stimuli and train students' critical thinking skills, particularly in terms of building basic skills. Students are expected to be able to identify the rukhsah values conveyed through the text.

Table 9. Table 10. Mapping Critical Thinking Skills Indicators with the Discovery Learning Model Syntax

Meeting	Discovery Learning Model	Critical Thinking Skills
1	Stimulation	Build basic skills
	Problem Statement	Provide simple explanations
2	Data Collection	Organize strategies and tactics
	Data Processing	Provide simple explanations Provide further explanations
3	Verification	Organize strategies and tactics Provide further explanations
4	Generalization	Draw conclusions

It should be noted that in the process of implementing the discovery learning model, researchers also asked students to form groups. In the process of discovering concepts about the values of rukhsah in their lives, they discussed them with friends in their group. They utilized relevant sources to assist in the discovery process until proof was found so that the concepts discovered were truly concrete and in accordance with the concept. According to (Ardita, Agustika and Wiyasa, 2023) The discovery learning model emphasizes student-centered learning strategies. Students are asked to investigate and discover problems themselves in discussion groups that emphasize the importance of understanding ideas and structures in learning activities. This model requires students to think more critically.

Compared to the lecture method, the application of the discovery learning model trains students to learn intensively to follow scientific investigation methods under the supervision of a teacher. Therefore, this model has the potential to train students' critical thinking skills. (Aliyawinata, Utari and Mahrawi, 2021). Discovery-based learning is considered appropriate for training students' critical thinking skills. It provides students with the ability to research and discover knowledge, accompanied by the ability to understand, write, collaborate, and think critically, creatively, and innovatively (Najwa, 2025). By involving students in active learning, encouraging exploration, and fostering deeper conceptual understanding, the discovery learning model has proven effective in improving students' thinking skills

and preparing them for future challenges (Hasna, Wirdaini and Juhji, 2024).

Regardless of the results of the following study, there are several limitations in the implementation of this study. For example, the implementation of the discovery learning model was applied to Islamic Education lessons, specifically on the topic of rukhsah for seventh-grade students. The application of the discovery learning model was found to have a significant effect on improving critical thinking skills among students at JHS 1 Buay Madang Timur, using a significance level of alpha 5%. Therefore, for further research, the application of the discovery learning model could be expanded to other topics and use a significance level of alpha other than 5%.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

These results demonstrate that the practical application of the discovery learning model improves the critical thinking skills of seventh-grade junior high school students in the rukhsah subject in Islamic Religious Education. Furthermore, this model encourages student engagement in the learning process, fosters curiosity, and helps students understand the rukhsah concept more deeply and contextually. Therefore, discovery learning can be used as an effective alternative learning model to improve the quality of Islamic Religious Education learning, particularly in developing students' critical thinking skills.

B. Suggestion

Critical thinking is one of the essential skills possessed by students. The results of this study indicate that the application of the discovery learning model is efficacious in improving students' critical thinking skills. Therefore, the results of this study can be utilized by stakeholders, such as schools, teachers, and future researchers, to empower students' critical thinking skills in Islamic Education learning, one of which is by applying the discovery learning model in Islamic Education learning. Finally, this learning model can be applied to other materials.

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