

AI ChatGPT-Based Islamic Religious Education to Enhance Students' Critical Thinking and Moral Reasoning

M Agus Salim & Fajri Habibi

STKIP Kumala Lampung, Indonesia

agusms1417@gmail.com; fajri.habibi@kumala.ac.id

Abstract

Higher education increasingly leverages artificial intelligence (AI) to foster higher-order cognitive skills; however, in Indonesia, students of Islamic Religious Education (PAI) often depend on rote memorization, limiting the growth of critical thinking and moral reasoning. This study aimed to determine the effectiveness of a ChatGPT-based PAI learning model in enhancing students' dual thinking abilities. A mixed-methods quasi-experimental design was implemented with 32 undergraduate students assigned equally to experimental and control groups; instruments comprised a critical thinking test, a moral reasoning test contextualized with Islamic dilemmas, and a transcript analysis guide, all expert-validated. Quantitative results showed notable post-test gains in the experimental group for critical thinking ($M = 78.6$, $SD = 7.8$) and moral reasoning ($M = 76.8$, $SD = 7.9$), while qualitative analysis indicated that 56.3% of students reached advanced critical thinking levels and 68.8% demonstrated advanced moral reasoning. The findings indicate that integrating ChatGPT enhances both cognitive and affective learning outcomes in PAI. The study concludes that a ChatGPT-based model is effective for strengthening critical thinking and moral reasoning, and contributes empirical evidence on generative AI in Islamic education; practically, it underscores ChatGPT's utility as a dialogic partner when guided by lecturers. The implications include scaling to larger samples and longer interventions and exploring adaptive prompting strategies across diverse educational contexts.

Keywords: ChatGPT; Generative AI; Islamic Religious Education (PAI); Critical Thinking; Moral Reasoning

INTRODUCTION

Higher education has seen a revolution thanks to artificial intelligence (AI), which offers cutting-edge, interactive, and adaptable teaching strategies. Generative AI such as ChatGPT has been widely recognized for its potential to enhance students' higher-order thinking skills (Chara-De lo Rios et al., 2025). Several studies confirm that AI can foster analytical and reflective abilities (Darwin et al., 2024), though concerns remain regarding students' overreliance on technology (Hou et al., 2025). Beyond cognitive aspects, AI is also linked to moral reasoning. Previous works highlight that AI can facilitate moral dilemmas and stimulate ethical reflection (Jiang et al., 2025; Zhang et al., 2022), yet it still requires human moderation to avoid bias (Bonnefon et al., 2024).

In the Indonesian context, Islamic Education faces persistent challenges. Learning practices remain dominated by rote memorization, while students' analytical and moral reasoning skills are underdeveloped (Taufik, 2020). Recent studies indicate that AI has begun to transform Islamic education, from increasing learning effectiveness (Salim & Rajabiyah, 2025) to supporting innovation and socio-cultural adaptation (Syukur et al., 2024). AI applications in PAI have shown positive effects, such as improving fiqh learning outcomes (Khoir et al., 2024) and strengthening cognitive-affective domains (AN et al., 2025). However, prior research has generally focused on broad technological integration, with limited empirical exploration of ChatGPT as a direct learning medium to foster both critical thinking and moral reasoning in Islamic education.

Based on the identified research gap, Three primary research questions are the subject of this study: (1) How does the ChatGPT-based Islamic Religious Education (PAI) learning model enhance students' critical thinking skills? (2) How does the model influence students' moral reasoning abilities? and (3) What qualitative characteristics of student engagement and reasoning patterns emerge during interactions with ChatGPT in PAI learning?

METHODS

A mixed-methods procedure was used in this investigation, mixing quantitative and qualitative techniques to evaluate the effectiveness of a ChatGPT-based Islamic Religious Education (PAI) model.

A quasi-experimental setup with non-equivalent groups serving as controls and experiments was employed in the quantitative component, while the qualitative component used content analysis of student–ChatGPT dialogues to capture patterns of engagement with Islamic moral dilemmas. This design was selected because full randomization was not feasible in natural classroom settings, yet it allowed for systematic comparison between groups.

The participants were 32 undergraduate students enrolled in the PAI course at STKIP Kumala Lampung. They were selected through purposive sampling to match the research objectives and were split equally between the control group of participants ($n = 16$) and the experimental group ($n = 16$).

Data has been obtained using three instruments: (1) a critical thinking test developed based on Ennis' indicators, (2) a moral reasoning test adapted from the Defining Issues Test and contextualized with Islamic dilemmas, and (3) a content analysis guide for evaluating student–ChatGPT transcripts. All instruments were validated by experts in Islamic education, pedagogy, and instructional media, with average scores exceeding 4.2 on a 5-point scale, indicating feasibility with minor revisions. The validation results are summarized in Table 1.

Table 1. Expert Validation Results

Validator	Average Score	Category	Notes/Recommendations
Islamic Education Expert	4.3	Feasible with minor revisions	Ensure ChatGPT outputs are aligned with authoritative Islamic sources; lecturer as moderator
Learning Methodology Expert	4.4	Feasible with minor revisions	Provide clearer lecturer guidelines; add more collaborative student activities
Media Expert	4.28	Feasible with minor revisions	Ensure consistent interface; filter terminology; provide offline alternatives

Table 1 shows that all experts rated the instruments as feasible with minor revisions. The recommendations emphasize alignment with Islamic sources, the importance of lecturer guidance, and technical refinements for broader accessibility.

The research was carried out in four sessions over a six-month period (April–September 2025). The procedure included preparation and validation of instruments, pre-test administration, intervention sessions, and post-test assessment. As illustrated in Figure 1, both groups followed parallel procedures, but with different learning treatments: the experimental group engaged in ChatGPT-based PAI learning, while the control group continued with conventional lectures.

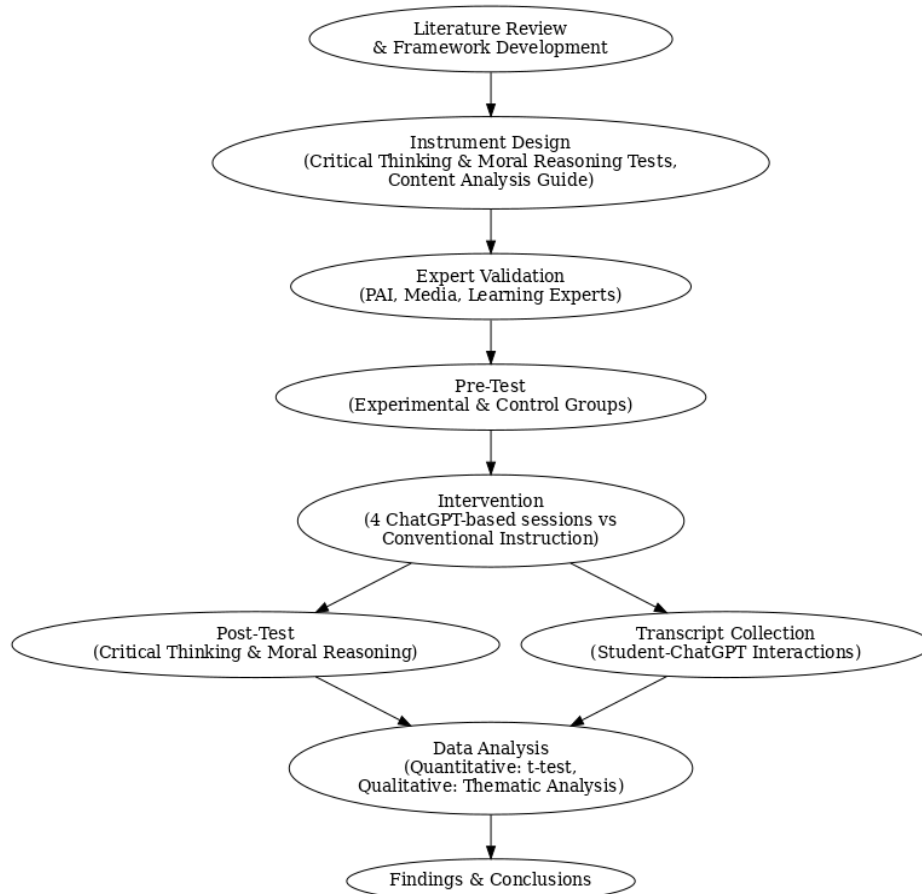


Figure 1. Research Flow Diagram

Descriptive analyses, pair-sample t-tests, and independent-sample t-tests were used to assess quantitative data to compare learning outcomes between groups. Qualitative data were analyzed thematically, guided by indicators of critical thinking and moral reasoning, and validated through triangulation to ensure credibility and reliability.

Data Collection

The research was conducted over six months (April–September 2025). The first two months were allocated to instrument development and expert validation. The intervention took place in four sessions, with the experimental group using ChatGPT-based learning while the control group received conventional instruction. Post-tests and transcript analysis were conducted in the final phase.

Data Analysis

Independent samples t test, paired sample t test, and descriptive statistical techniques were used to assess quantitative data (Okoye & Hosseini, 2024). Qualitative data were analyzed thematically, using indicators of critical thinking and moral reasoning as coding references (Salmona, M., & Kaczynski, D. 2024). Triangulation was applied to strengthen validity and reliability.

RESULTS

Before the intervention, The instruments' viability was confirmed by expert validation and the ChatGPT-based learning model. Three experts participated: one in Islamic Education, one in Learning Methodology, and one in Media. The results showed that all instruments were categorized as “feasible with minor revisions.” The average scores were 4.3 (Islamic Education), 4.4 (Learning Methodology), and 4.28 (Media). Minor improvements were suggested, such as aligning ChatGPT outputs with authoritative Islamic sources, adding clearer lecturer guidelines, and ensuring consistent user interface design.

Pre-Test Results

Before the intervention, both groups were assessed to ensure equivalence in their initial levels of critical thinking and moral reasoning. Table 2 displays the findings.

Table 2. Independent Samples t-test Results (Pre-Test)

Aspect	Group	N	Mean	SD	t-value	p-value
Critical Thinking	Experimental	16	62.5	7.5	0.27	0.79
	Control	16	61.8	7.9		
Moral Reasoning	Experimental	16	60.3	7.4	0.21	0.83
	Control	16	59.7	7.6		

Before the intervention, there were no discernible differences between the experimental and control groups, as Table 2 demonstrates. Both groups' mean scores were nearly the same, and statistical equivalence was confirmed by p-values greater than 0.05. This ensures that any differences observed in the post-test can be attributed to the intervention rather than pre-existing disparities. Such baseline comparability strengthens the internal validity of the quasi-experimental design (Handley et al., 2018).

Intervention Process

The intervention phase was conducted over four sessions to compare the effectiveness of the ChatGPT-based Islamic Religious Education (PAI) model with conventional lecture-based instruction. This stage was designed not only to deliver the treatment but also to observe students' engagement and the quality of classroom interaction. In quasi-experimental research, the process of implementation is critical because it provides contextual evidence of how the intervention operates in practice, beyond the numerical outcomes reflected in pre- and post-tests (Nair & Prem, 2020).

During the sessions, the experimental group interacted with ChatGPT through structured prompts that addressed authentic Islamic ethical dilemmas such as *riba* in online loans, *zakat* on digital income, business ethics, and academic honesty. These prompts encouraged students to analyze arguments, evaluate alternative perspectives, and reflect critically on moral decisions. By contrast, the control group received the same content through conventional lectures delivered by the instructor, relying on memorization and teacher explanation without interactive dialogue.

Classroom observations and transcript analysis provided additional insights into students' learning behaviors. The experimental group exhibited higher levels of participation and dialogic interaction, as students engaged not only with ChatGPT but also with peers under lecturer moderation. In contrast, the control group's engagement was limited, and discussions were generally normative rather than analytical. The outcomes of the intervention process are compiled in Table 3.

Table 3. Summary of Intervention Process Outcomes

Aspect	Experimental Group (ChatGPT-based)	Control Group (Conventional)
Student participation	85% active	55% active
Quality of discussion	High (reflective, analytical)	Moderate (limited interaction)
Critical thinking growth	56.3% reached CT3–CT5 (advanced level)	Dominant at CT1–CT2 (basic)
Moral reasoning growth	68.8% reached MR3–MR5 (advanced level)	Dominant at MR1–MR2 (normative)

Source: Classroom observation and transcript analysis, 2025.

Table 3 illustrates the superior outcomes achieved by the experimental group in terms of both engagement and reasoning skills. The high rate of student participation (85%) indicates that ChatGPT fostered a more dynamic and interactive learning atmosphere compared to conventional teaching (55%). In terms of discussion quality, The experimental group's kids were able to have thoughtful and critical conversations, while the control group remained at a moderate level with limited interaction. Growth in critical thinking was also more pronounced, with 56.3% of experimental group students reaching advanced levels (CT3–CT5), compared to the control group which remained at basic levels (CT1–CT2). Likewise, moral reasoning growth was stronger in the experimental group (68.8% at MR3–MR5), whereas the control group stayed at normative levels (MR1–MR2). These findings demonstrate that integrating ChatGPT into PAI learning not only promoted the growth of higher-order thinking skills but also raised student engagement.

Post-Test Results

After the four intervention sessions were completed, A post-test was administered to both groups to gauge how well their moral reasoning and critical thinking skills had developed. The experimental group (ChatGPT-based learning) and the control group (conventional lecture-based instruction) could be directly compared thanks to the post-test, which was the main measure of learning outcomes. In quasi-experimental studies, post-test analysis is particularly important because it provides empirical evidence of the causal effect of the treatment after controlling for baseline equivalence (Handley et al., 2018).

In Table 4, the independent-samples t-test results are displayed. Critical thinking and moral reasoning were two areas where the experimental group scored better than the control group, according to the findings, with statistically significant differences.

Table 4. Post-Test Results of Critical Thinking and Moral Reasoning

Aspect	Group	N	Mean	SD	t-value	p-value
Critical Thinking	Experimental	16	78.6	7.8	2.95	0.006
	Control	16	69.2	8.1		
Moral Reasoning	Experimental	16	76.8	7.9	2.80	0.009
	Control	16	67.5	8.2		

According to Table 4, the experimental group's pupils received mean scores of 76.8 for moral reasoning and 78.6 for critical thinking, both categorized as high. In contrast, the control group obtained mean scores of 69.2 for critical thinking and 67.5 for moral reasoning, both remaining at a moderate level. P-values < 0.01 indicated that the group differences were statistically significant, confirming the effectiveness of the ChatGPT-based intervention. These results indicate that generative AI, when appropriately integrated into PAI learning, not only improves students' analytical abilities but also enhances their moral reasoning. The results are consistent with earlier studies that highlighted AI's capacity to enhance higher-order thinking and encourage ethical reflection (Darwin et al., 2024; Jiang et al., 2025).

Comparative Outcomes

Even though the experimental and control groups' post-test results showed notable variations, it was crucial to take a closer look at how the learning outcomes were distributed. Comparative analysis helps to reveal not only mean score differences but also the proportion of students reaching advanced levels of reasoning. This type of study offers a more comprehensive view of the intervention's overall efficacy and ability to raise students' success levels across the board (Nair & Prem, 2020). The distribution of post-test outcomes is summarized in Table 5.

Table 5. Distribution of Post-Test Outcomes

Group	High Level (%)	Moderate Level (%)
Experimental	62.5	37.5
Control	25.0	75.0

In comparison to just 25% of the control group, 62.5% of students in the experimental group achieved the high category in both moral reasoning and critical thinking, as seen in Table 5. On the other hand, 75% of pupils in the control group continued to fall into the moderate range, indicating that conventional methods were less effective in promoting higher-order reasoning. These findings reinforce the earlier post-test results and highlight that the ChatGPT-based intervention was not only statistically significant but also

practically meaningful in elevating a larger proportion of students to advanced levels. The outcomes correspond with Darwin et al. (2024), who reported that students perceive AI as beneficial for strengthening critical thinking, and with Jiang et al. (2025), who emphasized AI's role in stimulating moral judgment through structured dilemmas.

Transcript Analysis

Beyond numerical test scores, transcript analysis was conducted to capture how students engaged with ChatGPT during the learning sessions. This qualitative component was essential for identifying patterns of interaction, the depth of student reasoning, and the extent to which ChatGPT facilitated dialogic learning. Transcript analysis allows researchers to explore not only whether students improved, but also how the improvement manifested in terms of reflective dialogue, questioning, and ethical deliberation (Salmona, M., & Kaczynski, D. 2024).

Table 6 displays the comparative overview of both groups' pre test and post test results depending on transcript analysis.

Table 6. Summary of Transcript Analysis Findings

Group	Pre Test	Post Test	Pre Test	Post Test
	Critical Think	Critical Think	Moral Reason	Moral Reason
Experimental	62.5 (Moderate)	78.6 (High)	60.3 (Moderate)	76.8 (High)
Control	61.8 (Moderate)	69.2 (Moderate)	59.7 (Moderate)	67.5 (Moderate)

Table 6 shows that the experimental group progressed from moderate to high levels in both critical thinking and moral reasoning, while the control group remained within the moderate range. These findings illustrate how useful ChatGPT is in elevating students' reasoning abilities through structured dialogic engagement. The data also suggest that the intervention encouraged students to shift from reproducing memorized information toward constructing reflective and analytical responses. This qualitative evidence complements the quantitative findings, confirming that the ChatGPT-based model provided both measurable and observable improvements in higher-order learning outcomes.

Qualitative Findings

In addition to the transcript summary, a more detailed qualitative analysis was conducted to identify the distribution of students across different levels of critical thinking and moral reasoning within the experimental group. This stage of analysis provides nuanced insights into how individual students progressed, highlighting not only average

improvements but also variations in achievement. Such distributional evidence is important in educational research because it indicates whether an intervention benefits the majority of learners or only a subset of them (Salmona, M., & Kaczynski, D. 2024). The distribution of reasoning levels in the experimental group is summarized in Table 7.

Table 7. Distribution of Qualitative Findings (Experimental Group, n = 16)

Indicator	Levels Achieved	Percentage
Critical Thinking	9 students at CT3–CT5 (advanced)	56.3% high
	7 students at CT1–CT2 (basic)	43.7% mod.
Moral Reasoning	11 students at MR3–MR5 (advanced)	68.8% high
	5 students at MR1–MR2 (normative)	31.2% mod.

Table 7 demonstrates that over half of the experimental group's pupils (56.3%) attained advanced critical thinking skills (CT3–CT5), while 43.7% remained at the basic to moderate levels (CT1–CT2). In terms of moral reasoning, an even larger proportion (68.8%) reached advanced levels (MR3–MR5), reflecting their ability to deliberate on ethical dilemmas using reflective judgment grounded in Islamic values. However, 31.2% of students remained at normative levels (MR1–MR2), suggesting reliance on rule-based responses rather than deeper ethical analysis. These findings imply that while the ChatGPT-based intervention successfully stimulated higher-order reasoning for most students, additional lecturer scaffolding is still needed to elevate all learners to advanced levels. The qualitative distribution thus complements the quantitative results, confirming that the intervention was both impactful and practical in promoting dual reasoning skills in Islamic Religious Education.

For **critical thinking (CT)**, 56.3% of students were able to operate at advanced levels (CT3–CT5), where they questioned assumptions, weighed evidence, and generated alternative arguments. However, 43.7% remained at lower levels (CT1–CT2), indicating that some students were still reproducing information without significant reflection. This suggests that while ChatGPT stimulated analytical dialogue, additional scaffolding from lecturers was needed to elevate all students to higher-order thinking.

For **moral reasoning (MR)**, 68.8% of students achieved advanced levels (MR3–MR5). Their responses reflected ethical deliberation grounded in Islamic principles, particularly in dilemmas such as digital zakat, online loan *riba*, and academic honesty. Meanwhile, 31.2% of students remained at normative levels (MR1–MR2), primarily focusing on obedience to rules rather than deeper ethical considerations. This finding implies that

ChatGPT encouraged many students to move beyond rote responses, but continuous integration with Islamic virtue ethics remains crucial.

Overall, the qualitative analysis complements the quantitative results by showing that ChatGPT not only improved scores but also fostered reflective and ethical engagement in learning.

DISCUSSION

The study's findings demonstrated that the Islamic Religious Education (PAI) learning paradigm based on ChatGPT substantially enhanced students' critical thinking and ethical reasoning compared to conventional teaching methods. The quantitative analysis showed significant differences in post-test scores, while the qualitative findings highlighted meaningful growth in students' ability to analyze and reflect ethically.

Critical Thinking Enhancement

On the post-test critical thinking, the experimental group's score was noticeably higher ($M = 78.6$, $SD = 7.8$) than the other group ($M = 69.2$, $SD = 8.1$), according to the independent samples t test ($t(30) = 2.95$, $p = 0.006$). These results demonstrate that ChatGPT effectively supported students in developing higher-order thinking. However, qualitative findings indicated that only 56.3% of students reached advanced critical thinking levels (CT3–CT5), while 43.7% remained at basic levels. This suggests that although ChatGPT is beneficial, lecturer moderation and structured scaffolding remain necessary. These results are consistent with Chara-De lo Rios et al. (2025), who found that AI can foster deeper analysis, but must be integrated carefully to avoid superficial engagement.

Moral Reasoning Development

Similarly, moral reasoning scores in the experimental group ($M = 76.8$, $SD = 7.9$) were significantly higher than those of the control group ($M = 67.5$, $SD = 8.2$), with $t(30) = 2.80$, $p = 0.009$. Qualitative analysis revealed that 68.8% of students reached advanced moral reasoning levels (MR3–MR5), indicating that ChatGPT facilitated reflective dialogue on Islamic ethical dilemmas. Nevertheless, 31.2% of students remained at normative levels (MR1–MR2), reflecting a reliance on rule-based responses. This is consistent with Raquib et al. (2022) and Jiang et al. (2025), who demonstrated that moral reflection can be sparked by

AI-generated challenges, who emphasized the need for embedding Islamic virtue ethics in AI-assisted learning.

Implications for Islamic Education

The findings strengthen the growing literature on AI in Islamic education. While Salim and Rajabiyah (2025) reported that AI enhances effectiveness and innovation, this study provides empirical evidence of how generative AI specifically supports the dual dimensions of reasoning—critical and moral—that are central to PAI. The results also highlight the importance of lecturers as moderators, as cautioned by Serafimova (2020), making certain that AI results complement Islamic principles and educational objectives.

Limitations and Future Directions

It is critical to recognize the several limitations of this study. The sample size was initially rather small ($n = 32$) and came from just one institution (STKIP Kumala Lampung), restricting the applicability of the results. Second, because the intervention only lasted four sessions, it is yet unknown how ChatGPT-based learning may affect students' critical thinking and ethical reasoning in the long run. Third, the research depended on text-based exchanges with ChatGPT, whereas other forms (like voice-activated or multimedia-augmented AI learning) were overlooked. Fourth, although expert validation was conducted, ChatGPT's responses may still contain biases or inconsistencies, particularly in referencing Islamic sources. Finally, qualitative findings were based on thematic coding of transcripts, which, despite triangulation, remains subject to researcher interpretation.

Subsequent studies must tackle these shortcomings by engaging larger and more varied samples, increasing intervention durations, integrating multimodal AI technologies, and enhancing content validation systems for Islamic education.

CONCLUSION

This study concludes that the ChatGPT-based Islamic Religious Education (PAI) learning model significantly improved students' critical thinking and moral reasoning skills compared to conventional methods. Quantitative analysis demonstrated meaningful improvements in post-test scores, while qualitative findings revealed that a majority of students achieved advanced levels of reasoning.

In theory, This work contributes to the corpus of research on AI in Islamic education by providing factual data that generative AI can simultaneously enhance cognitive (critical thinking) and affective (moral reasoning) domains.

Practically, the findings provide direct implications for lecturers of Islamic Religious Education. ChatGPT can be used as a dialogic partner in classroom learning, offering students case-based prompts and opportunities for ethical reflection. However, lecturers must remain central as moderators—guiding discussions, ensuring alignment with Islamic sources, and providing scaffolding for students who remain at basic reasoning levels. This balance between AI assistance and human moderation ensures that technological innovation strengthens, rather than replaces, the moral and pedagogical roles of PAI educators.

Future studies are encouraged to involve larger samples, extend intervention durations, and explore adaptive prompt strategies to maximize learning outcomes across diverse educational contexts.

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