Bidayatuna Jurnal Pendidikan Guru Madrasah Ibtidaiyah
Vol. 09 No. 01 April 2026
DOI: 10.54471/bidayatuna.v9i1.3863
E-ISSN: 27150232 | P-ISSN : 26212153

The Effect of Lecture-Based and Interactive Tauhid Learning Models on Students' Cognitive Learning Outcomes in Islamic Elementary Education

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Received: March 9, 2026
Revised: March 28, 2026
Accepted: April 03, 2026
Available online: April 15, 2026

To cite this article: Hasri, H., Wardi, M.M., Mappanyompa, Balang, N.,J, (2026). The Effect of Lecture-Based and Interactive Tauhid Learning Models on Students' Cognitive Learning Outcomes in Islamic Elementary Education, *Bidayatuna : Jurnal Pendidikan Madrasah Ibtidaiyah 9*(1), 1–12.

Abstract

Strengthening the understanding of Tawhid in elementary schools is important because its abstract concepts require effective learning strategies. With the dominance of lecture methods that minimize student involvement, an interactive approach is needed to encourage active participation and cognitive deepening. This study examines the individual and combined effects of lecture-based Tawhid instruction (X1) and interactive Tawhid instruction (X2) on students' cognitive learning outcomes (Y) among 58 fifth-grade students at an Integrated Islamic Elementary School selected via census sampling. This study employs an explanatory quantitative design. The independent variables were operationalized using a 15-item structured questionnaire on a Likert scale that measured the quality of implementation of each learning model as experienced by the students, with construct validity confirmed through corrected item-total correlations ($r \geq 0.30$) and Cronbach's Alpha coefficients ($\alpha = 0.84$ for X1; $\alpha = 0.81$ for X2; $\alpha = 0.87$ for Y). Cognitive learning outcomes were measured through documentation of daily cognitive test scores obtained directly from subject teachers, including pre- and post-implementation scores. Data were analyzed using paired-sample t-tests and multiple linear regression at $\alpha = 0.05$. The results of the paired-sample t-test indicated a statistically significant increase in cognitive scores ($t = -5.406$; $df = 57$; $p < 0.001$). Both models simultaneously explained 16.1% of the variation in cognitive learning outcomes ($F = 5.261$; $p = 0.008$; $R^2 = 0.161$). The interactive model showed a significant positive effect ($\beta = 0.343$; $p = 0.022$), while the lecture model did not reach significance ($\beta = -0.303$; $p = 0.071$). The findings advance a theoretical implication that interactive pedagogical strategies mediate the translation of abstract Tawhid concepts into measurable cognitive achievement, highlighting the necessity of active engagement frameworks in Islamic elementary learning. This conceptualization contributes a refined understanding of instructional effectiveness, offering guidance for future curriculum design that integrates traditional and interactive learning paradigms.

Keywords: Cognitive Learning Outcomes; Interactive Instruction; Lecture-Based Instruction; Tawhid Education; Conceptual Framework; Islamic Elementary School.

1. Introduction

Elementary education plays a strategic role in shaping students' intellectual, moral, and spiritual foundations from an early age, where quality learning not only meets academic goals but also instills character values that are sustainable and essential for life (Aulia, 2023). In Islamic Elementary Schools (SDI), the development of religious character holds an equal standing with cognitive achievement, making the internalization of faith a core educational goal inseparable from the entire learning process (Hattie & Donoghue, 2016; Nonci 2021; Nuryanti et al., 2024). In the Islamic education curriculum, Tawhid occupies the most fundamental position as the theological foundation underpinning all students' religious understanding; however, its highly abstract concepts including the attributes of Allah, and monotheistic beliefs (aqidah) present unique pedagogical challenges that demand teaching strategies capable not only of conveying information but also of fostering a genuine and deep internalization of faith in every student (Hanafi et al., 2021; Asykur et al., 2025; Sahin, 2018)

In the teaching of Tawhid in Islamic elementary schools, the lecture method remains the most widely used instructional approach, primarily due to its ability to convey complex theological material systematically and efficiently in terms of time (Stains et al., 2018; Hasan et al., 2024). However, empirical studies consistently reveal that lecture-based instruction, when implemented in isolation, places students in a passive role with minimal opportunities for active engagement, thereby creating an excessive reliance on the teacher's individual verbal skills a practice proven to be highly problematic in Tawhid education, where deep conceptual understanding and the authentic internalization of faith are far more important than the rote memorization of superficial facts in educational value (Suryadinata, 2024)

Interactive learning models are becoming increasingly popular and are recommended as a more effective approach to fostering meaningful cognitive engagement among students (Arrumi, 2025; Mercer et al., 2019). Interactive learning models emphasize a dialogic, collaborative, and participatory learning process, in which students not only receive information but also actively engage in knowledge construction through discussions, question-and-answer sessions, and collaborative problem-solving (Gillies, 2023; Rosyid & Diyah, 2025). This approach is highly aligned with the developmental characteristics of elementary school students, who learn most effectively through concrete experiences and meaningful social interactions (Ningrum, 2025)). In the specific context of Tawhid education, interactive methods are believed to bridge the gap between abstract theological concepts and students' everyday realities, thereby fostering a deeper, more contextual, and lasting conceptual understanding (Arrumi, 2025; Latuconsina, 2023).

Based on research by Theobald (2020), who demonstrate that the benefits of active learning are inclusive and equitable, and provide greater advantages for students from diverse backgrounds. Hattie and Donoghue (2016) also identified interactive learning strategies rich in feedback as the strongest predictor of learning outcomes compared to other teaching strategies. In addition, collaborative learning environments have been shown to support both academic achievement and intrinsic

motivation among elementary school students (Dewsbury et al., 2022; Jeong et al., 2019; Sulistyowati et al., 2023)

Although research in this field continues to evolve, there are still several gaps that require further attention. Previous studies have largely focused on Islamic education in general or on ethical dimensions, resulting in limited attention to Tawhid as a pedagogical domain with its own unique cognitive complexities (Arrumi, 2025). Furthermore, although interactive learning has been widely recognized as an effective method for enhancing student engagement and learning outcomes, its application has not been sufficiently studied within the specific institutional context of Islamic elementary schools, which may impact its implementation and effectiveness (Radianti et al., 2020; Putkonen et al., 2025). Furthermore, although previous research has examined lecture-based and interactive approaches separately, studies exploring the integration of both within a unified analytical framework in Tawhid instruction remain relatively limited (Hutapea et al., 2021; Santosa et al., 2023).

Based on these gaps, this study aims to examine the effects of lecture-based and interactive Tawhid instruction on students' cognitive learning outcomes at Islamic elementary schools. This study emphasizes the importance of students' active engagement in the learning process as an effort to help them understand abstract Tawhid concepts. The strength of this study lies in the integrative approach used, which analyzes the contribution of each method while examining their combined influence within a single analytical framework. In this regard, this study developed the Cognitive Engagement Integrative Tawhid Learning Framework (CEITLF), which views the lecture method as the foundation for building conceptual understanding, while interactive learning plays a role in activating thinking processes and deepening students' understanding. Through this approach, this study seeks to provide a more comprehensive picture of the process by which cognitive learning outcomes are formed in Tawhid instruction.

2. Methods

This This study employed an explanatory quantitative design to examine the effects of lecture-based (X1) and interactive (X2) Tawhid instruction on students' cognitive learning outcomes.. This design aligns with the planned statistical analyses, including paired t-tests, ANOVA, and multiple linear regression, which allow for assessing both individual and combined effects of the learning models, analysis of variance (ANOVA) to evaluate the simultaneous significance of regression models, and multiple linear regression analysis to examine the individual and combined contributions of X1 and X2 to Y, thus clearly distinguishing this design from a descriptive survey design, which merely describes the distribution of variables without explaining predictive relationships among them (Cohen , 2017).

The study was conducted at SD Islam Aswaja Darul Falah Mataram, which was purposively selected because it has implemented structured Tawhid instruction by integrating lecture and interactive methods, making it relevant for examining the influence of these two pedagogical approaches on students' cognitive learning outcomes. The research subjects were determined using census sampling; All 58 fifth-grade students were included using census sampling, enabling complete data

collection. All students had participated consistently in both lecture-based and interactive Tawhid instruction, ensuring readiness for cognitive assessment. In addition to the students, the Islamic Religious Education teacher and the school principal were also involved in this study. Subject teachers served as sources of data on students' cognitive learning outcomes while also verifying the consistency of the learning model's implementation in the classroom, whereas the school principal was interviewed directly to obtain contextual information regarding institutional policies related to the implementation of Tawhid instruction at the school. The involvement of both groups was not included in the main statistical analysis but served as contextual triangulation to strengthen the interpretation of quantitative findings.

Data collection was conducted using two primary sources: a structured questionnaire and documentation of students' daily cognitive scores. The questionnaire consisted of 15 closed-ended statements measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), developed to operationalize the independent variables by measuring the quality of implementation and intensity of each learning model as experienced by students during the learning process, based on indicators of the lecture learning model (X1), the interactive learning model (X2), and the dimensions of cognitive learning outcomes, which include remembering, understanding, and applying in accordance with Bloom's taxonomy (Adams, 2015). Cognitive learning data (Y) were obtained through documentation of daily test scores provided directly by the Islamic Religious Education teacher, including scores taken before and after the implementation of the integrated Tawhid learning model, as a measure of students' cognitive achievement.

Data The research procedure was conducted in four sequential stages. The preparatory stage included obtaining permits, conducting an initial observation of the learning environment, validating the questionnaire, and interviewing the school principal to gain an understanding of institutional policies. The implementation stage included eight sessions of Tauhid instruction over two months, held once a week for 60 minutes each, covering the obligatory, impossible, and permissible attributes of Allah along with their supporting evidence; lecture sessions consisted of a 30-minute presentation, a 15-minute guided Q&A, and 15 minutes of individual reflection, while the interactive sessions include 20 minutes of small-group discussion, 20 minutes of collaborative problem-solving and presentation, and 20 minutes of teacher-led Q&A and feedback (Gillies, 2023; Mercer et al., 2019).

The data collection phase was conducted by distributing questionnaires to all students and obtaining documentation of daily cognitive scores from the Islamic Education teachers. The data analysis phase utilized JASP software through descriptive analysis, the Kolmogorov-Smirnov normality test, the paired-sample t-test, multiple linear regression, ANOVA, and regression coefficient analysis, with a significance threshold of $\alpha = 0.05$ (Khashayanti et al., 2024)

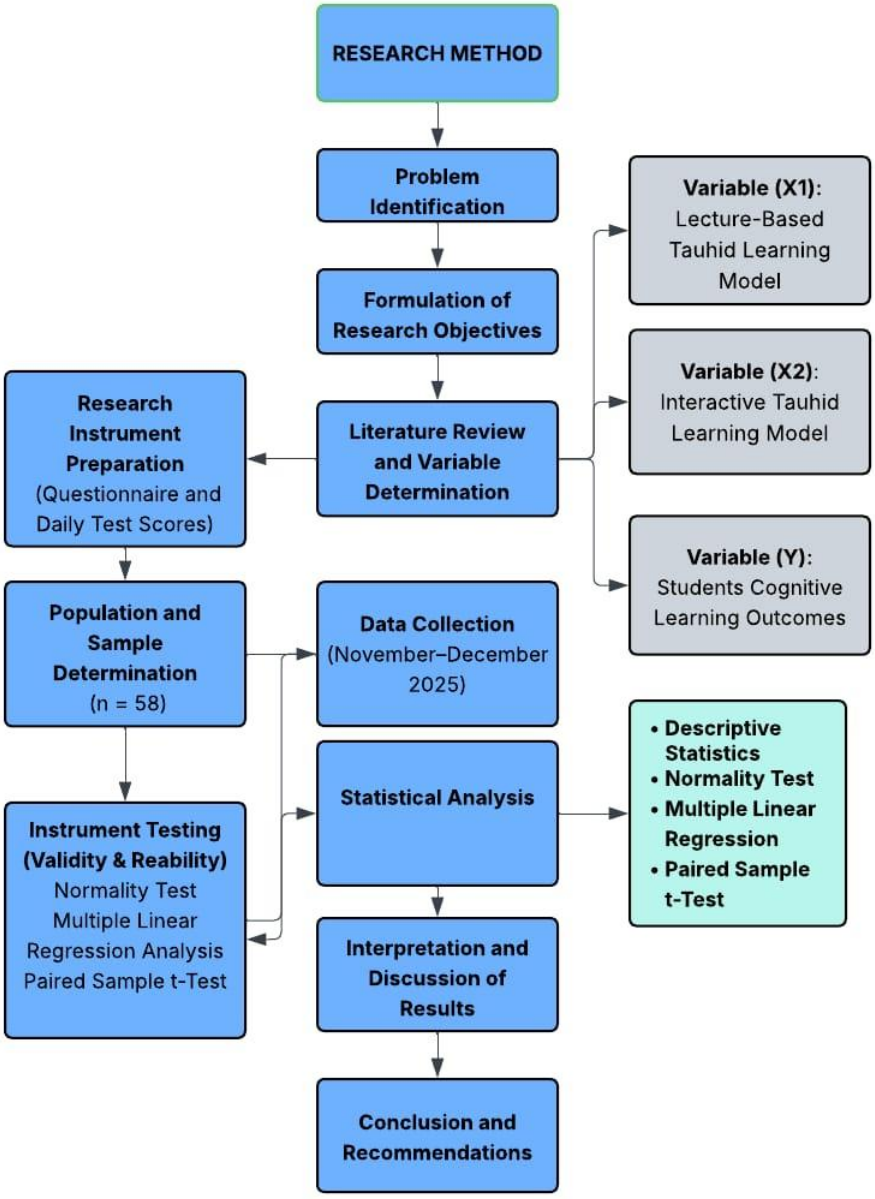

Figure 1 *Procedure Research*

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3. Results

1. Analysis Descriptive Statistics

This section presents descriptive statistics to describe the characteristics of the data. Descriptive statistics analysis can be seen in Table 1.

Table 1 *Descriptive Statistics of Research Variables*

	X1	X2	Y
Valid	58	58	58
Median	80.00	80	83.00
Mean	79.91	80	84.55
Std. Deviation	4.695	5	6.176
Variance	22.05	28	38.15
Minimum	68.00	68	73.00
Maximum	88.00	92	98.00

Based on Table 1, all three variables yielded 58 valid data points with no missing values. The median values of X1 and X2 are both 80.00 while Y records a median of 83.00, and mean scores of 79.91, 80.00, and 84.55 respectively indicate consistently high response patterns across all variables. Score ranges of 68–88 for X1, 68–92 for X2, and 73–98 for Y confirm that variation remains within acceptable performance boundaries. Standard deviation values of 4.695 for X1, 5.000 for X2, and 6.176 for Y, accompanied by variance values of 22.05 for X1, 28.00 for X2, and 38.15 for Y, indicate moderate data diversity with the greatest variation observed in variable Y. Overall, the three variables display high values with stable distribution, rendering the data sufficiently representative and suitable as a basis for further inferential analysis, including paired samples t-test, multiple linear regression, and ANOVA.

2. Normality Test

This section presents normality testing to ensure that the data distribution meets the assumptions of parametric analysis. The normality test analysis (Kolmogorov-Smirnov) can be seen in Table 2.

Table 2 *Normality Test Results (Kolmogorov-Smirnov)*

Variable	Statistic	p
X1	0.165	.085
X2	0.168	.075
Y	0.150	.146

Based on Table 2, of the Kolmogorov–Smirnov normality test, it was found that variable X1 had a p-value of 0.085, X2 had a p-value of 0.075, and Y had a p-value of 0.146, all of which were above the significance threshold of 0.05. These findings indicate that the three variables follow a normal distribution because there are no significant differences between the empirical data distribution pattern and the theoretical normal distribution. Thus, the normality assumption is fulfilled, the data are eligible for analysis using parametric statistical methods, including paired samples t-test, multiple linear regression, and ANOVA. The fulfillment of this assumption also provides a strong basis for the validity of further analysis, because normal data distribution allows for more accurate parameter estimation, makes hypothesis testing more reliable, and reduces the potential for bias in drawing conclusions; therefore, researchers can continue the inferential analysis process with confidence that the data has met the necessary statistical criteria.

3. Paired Samples T-Test

This section presents the T-test (paired sample t-test) to identify significant differences between the groups or variables being compared. The multiple paired sample t-test analysis can be seen in Table 3.

Table 3 *Results of the Paired Samples T-Test*

Measure 1		Measure 2	t	df	p
Pre-test	-	Post-test	−5.406	57	< .001

Note. Student's t-test.

Based on Table 3, the Paired Samples T-Test using Student's t-test indicates that the comparison of pre-test and post-test scores yielded a t-value of –5.406 with 57 degrees of freedom and a significance level of $p < .001$. These results indicate a statistically significant difference between the two measurements. This improvement reflects a genuine gain in students' cognitive learning outcomes following the implementation of the integrated Tauhid learning model. The negative t-value indicates that the mean Post-test score is higher than the mean Pre-test score, reflecting an improvement in student learning outcomes. Although Cohen's d is not available, the magnitude of the t-value indicates that the treatment effect is substantial, meaning the observed difference is not only statistically significant but also has practical relevance. Overall, these findings confirm that the implemented learning method has a significant and positive influence on students' cognitive achievement.

4. Multiple Linear Regression Analysis

This section presents the results of multiple linear regression analysis (summary) to provide an overview of the research findings. The Summary of Multiple Linear Regression Analysis can be seen in Table 4.

Table 4 *Summary of Multiple Linear Regression Analysis*

Model	R	R^2	Adjusted R^2	RMSE
M_0	0.000	0.000	0.000	6.176
M_1	0.401	0.161	0.130	5.761

Note. M_1 includes X1, X2

Based on Table 4, the baseline model (M_0) yields R = 0.000 and R^2 = 0.000, confirming that without X1 and X2 the model has no capacity to explain variation in Y. In the advanced model (M_1), the inclusion of both predictors increases R to 0.401 with R^2 = 0.161 and Adjusted R^2 = 0.130, indicating that X1 and X2 jointly account for 16.1% of the total variance in cognitive learning outcomes — a modest yet statistically significant contribution by educational research standards. The decrease in RMSE from 6.176 to 5.761 confirms improved prediction accuracy. The remaining 83.9% of unexplained variance suggests that cognitive learning outcomes are also substantially determined by factors beyond the current model, including teacher pedagogical competence, students' prior knowledge and motivation, learning environment quality, and institutional support, underscoring the need for a more comprehensive multi-variable framework in future research.

5. Analysis of Variance (ANOVA)

This section presents the results of ANOVA to evaluate the overall statistical significance of the regression model. The ANOVA results can be seen in Table 5.

Table 5 *Analysis of Variance (ANOVA)*

Model		Sum of Squares	df	Mean Square	F	p
M_1	Regression	349.2	2	174.58	5.261	.008
	Residual	1825.2	55	33.19		
	Total	2174.3	57			

Note. M_1 includes X1, X2

Based on Table 5, the ANOVA results for Model 1 (M_1), which includes X1 and X2 as predictors, show that the regression sum of squares is 349.2 with a mean square of 174.58, an F value of 5.261, and a significance level of p = 0.008, indicating that the regression model as a whole is significant in explaining the variation in

variable Y. These values confirm that the combination of X1 and X2 contributes significantly to the formation of the prediction model, making the model involving both variables better than the model without predictors. The Sum of Squares Residual of 1825.2 with a mean square of 33.19 indicates that there is still variation in Y that cannot be explained by the model, but the significance of $p < 0.05$ ensures that the regression model is feasible to use because simultaneously X1 and X2 are proven to have a significant effect on Y, even though the strength of the explanation is in the low to moderate category.

6. Multiple Regression Coefficient Analysis

This section presents the coefficient estimation results to show the effect of each independent variable on the dependent variable. The multiple regression coefficient test analysis can be seen in Table 6.

Table 6 *Multiple Regression Coefficient Analysis*

Model		Unstandardized	Standard Error	Standardized	t	p
M_0	(Intercept)	84.552	0.811		104.258	< .001
M_1	(Intercept)	136.197	16.196		8.409	< .001
	X1	-0.303	0.164	-0.230	-1.842	0.071
	X2	0.343	0.145	0.296	2.365	0.022

Based on Table 6, the regression coefficient results for both models are presented as follows. Model 0 (M_0) shows that the intercept value of 84.552 with a significance level of < 0.001 represents the estimated mean of Y when no predictor variables are included; thus, this model only describes the baseline value without considering the effects of X1 or X2. In Model 1 (M_1), the intercept value increases to 136.197 with a significance level of < 0.001, indicating that when the values of X1 and X2 are zero, the initial value of Y is estimated to be that figure. The coefficient of X1 is –0.303 with $p = 0.071$, indicating that although the direction of X1's effect on Y is negative, its effect is not statistically significant at the 5% significance level; thus, it cannot be said to make a strong contribution to changes in Y. Conversely, the coefficient of X2 is 0.343 with $p = 0.022$, indicating that X2 has a significant positive effect on Y, where a one-unit increase in X2 increases Y by 0.343 units. Thus, in the regression model involving both predictors, only X2 was found to have a significant effect on Y, while X1 did not show a statistically significant effect. This finding is consistent with the theoretical expectation that interactive learning makes a positive contribution to cognitive learning outcomes.

4. Discussion

This study shows that the integration of the lecture method (X1) and interactive learning (X2) in Tawhid instruction significantly improves students' cognitive learning outcomes at the Integrated Islamic Elementary School. ANOVA results indicate that both methods together have a significant effect on cognitive learning outcomes ($F = 5.261$; $p = 0.008$), while multiple linear regression analysis shows that interactive learning (X2) is the only statistically significant predictor ($\beta = 0.343$; $p = 0.022$), whereas the lecture method (X1) alone does not show a significant effect ($\beta = -0.303$; $p = 0.071$). The combination of these two predictors explains 16.1% of the variation in cognitive learning outcomes ($R^2 = 0.161$), suggesting that students' active engagement plays a more critical role in understanding abstract concepts than teacher-centered lectures alone (Theobalda et al., 2020; Hattie & Donoghue, 2016). The paired-sample t-test further confirms that students' post-test scores were substantially higher than pre-test scores ($t = -5.406$; $df = 57$; $p < 0.001$), reflecting practical improvements in cognitive achievement.

From a constructivist learning theory perspective, these findings indicate that knowledge is actively constructed through social interaction, reflection, and collaborative problem-solving rather than passively received (Arrumi, 2025; Mercer et al., 2019) In the context of Tawhid learning, interactive methods such as group discussions, guided Q&A sessions, and collaborative problem-solving enable students to understand abstract theological concepts more effectively than lectures alone. These findings align with Gillies (2023) and Koç & Kanadlı (2025), who demonstrated that dialogic and inquiry-based approaches enhance conceptual understanding and critical thinking skills across diverse educational contexts.

This study proposes the Cognitive–Engagement Integrative Tawhid Learning Framework (CEITLF), which views lectures as providing foundational knowledge and interactive learning as activating higher-order cognitive processes. This framework offers theoretical novelty by combining traditional and interactive pedagogies into a unified model specifically for Tawhid instruction, addressing a gap in previous research that typically focused on only one method (Radianti et al., 2020; Hutapea et al., 2021). CEITLF serves as both a practical and theoretical guide for designing integrated learning strategies that optimize students' cognitive engagement in religious education.

Although the results are positive, the moderate R^2 value (16.1%) indicates that other factors also influence cognitive learning outcomes, such as teacher competence, prior knowledge, student motivation, institutional support, and school facilities (Anggraeni et al., 2023; Fatmawati, 2025; Kurniasandi et al., 2023; Li Lu et al., 2025). These findings suggest that while the integrated model is effective, its success heavily depends on broader educational and institutional conditions. Future research is recommended to explore the interaction between these factors and instructional methods to further optimize cognitive achievement.

Overall, this study provides important empirical and theoretical contributions. Empirically, it confirms that combining lectures and interactive methods enhances cognitive learning outcomes in Tawhid instruction. Theoretically, it introduces CEITLF, integrating foundational knowledge with active learning strategies, thereby

expanding understanding of pedagogical design in religious education (Radianti et al., 2020; Gillies, 2023; Mercer et al., 2019). Practically, the findings highlight the importance of teacher competence, systematic planning, and adequate facilities to implement integrated learning strategies effectively. This integrative framework can serve as a reference for practitioners and educational researchers to optimize student learning outcomes at Islamic elementary schools (Aryfien et al 2025).

Thus, the application of the Tauhid learning model, which integrates lecture and interactive methods, has been proven to influence the improvement of students' cognitive learning outcomes. Its successful implementation is highly dependent on careful planning, teacher competence, and the availability of adequate facilities and infrastructure. In addition, the use of interactive learning strategies and media needs to be supported by appropriate pedagogical approaches and educational system support so that its impact on students' conceptual understanding and engagement is optimal.

5. Conclusions

Based on the analysis results, The findings of this study indicate that the integrative lecture-based and interactive Tawhid learning model positively influences students' cognitive learning outcomes in Integrated Islamic Elementary Schools. The paired-sample t-test showed a significant increase in cognitive scores from pre-test to post-test ($t = -5.406$, $df = 57$, $p < 0.001$), while ANOVA confirmed that the combined lecture and interactive methods significantly affect learning outcomes ($F = 5.261$, $p = 0.008$). Multiple linear regression analysis revealed that interactive learning (X2) significantly contributes to explaining 16.1% of the variance in cognitive outcomes ($R^2 = 0.161$), whereas lecture-based instruction primarily functions as a foundation for conceptual understanding. These results support the proposed Cognitive–Engagement Integrative Tawhid Learning Framework (CEITLF), which conceptualizes lecture-based instruction as a cognitive structuring mechanism and interactive learning as a cognitive activation and engagement mechanism, highlighting their complementary roles in facilitating the understanding of abstract Tawhid concepts.

From a theoretical and practical perspective, this study advances the understanding of how structured knowledge delivery and active engagement can work synergistically in religious education. The framework provides a clear theoretical implication, demonstrating that cognitive learning outcomes are maximized when lecture content is reinforced by interactive methods such as guided questioning, discussions, and collaborative problem-solving. Practically, these findings suggest the importance of systematic lesson design, teacher competence in interactive strategies, and institutional support to optimize learning effectiveness. Future research is encouraged to explore the integration of interactive learning with other pedagogical approaches and to examine its impact on cognitive, affective, and skill-based outcomes, ensuring both measurable and sustainable improvements in students' learning.

6. CRediT Authorship Contribution Statement

Hijratul Hasri: Conceptualization, data curation, formal analysis, investigation, methodology, project administration, resource provision, software development, validation, visualization, initial draft writing, and writing – review and editing. **Muhammad Musfiatul Wardi**: Supervision, validation, and writing – review and editing. **Mappanyompa**: Supervision, validation, and writing – review and editing.

7. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

8. Data Availability

Data will be made available on request.

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