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Padlet-Based Predict Observe Explain (POE) Learning Model: Learning Outcomes of PAI and Character Education

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ABSTRACT

This research is motivated by low student learning outcomes in Islamic Religious Education (PAI) and Character Building at Middle School 7 Krui, particularly in higher-order thinking skills (C5 and C6). This issue stems from monotonous teaching methods, varied student comprehension levels, limited media, and low motivation. This study aims to determine the effect of the Padlet-based Predict-Observe-Explain (POE) learning model on student learning outcomes. Using a quantitative approach with a quasi-experimental, post-test only control group design, the sample comprised two classes: an experimental class taught via the Padlet-based POE model and a control class taught conventionally. Data were collected using validated and reliable multiple-choice tests, then analyzed using normality, homogeneity, t-test, and Mann-Whitney tests. The results showed a significant difference in learning outcomes between the two groups, with a t-test significance value of 0.030 and a Mann-Whitney test value of 0.040 ($p < 0.05$). This indicates that the Padlet-based POE model effectively improves learning outcomes, especially in critical and analytical thinking. This success is driven by the POE syntax—prediction, observation, and explanation—integrated with interactive digital media, which enhances student activity, motivation, and comprehension. In conclusion, the Padlet-based POE learning model has a positive and significant influence on student learning outcomes. It serves as an innovative and effective alternative learning strategy for Islamic Religious Education and Character Education.

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1. INTRODUCTION

In everyday life, learning is understood as a conscious effort to acquire new understanding and abilities through the dynamics of their experiences (Mardicko, 2022). Effective learning is a reciprocal interaction between teachers and students, which plays a central role in determining academic success (Gebresilase et al., 2025). In the context of Islamic Religious Education (PAI) and Character Education, particularly in the aspect of Islamic Cultural History, learning is not merely a transfer of past information but

aims to empower students to understand life issues related to Islamic law and the dynamics of the development of Muslim civilization (Al Anshory, 2020). Through a comprehensive understanding of culture influenced by Islamic teachings, students are expected to learn lessons and develop character values for implementation in modern life.

Learning outcomes are an essential indicator for measuring the extent to which students have achieved instructional objectives (Fauhah & Rosy, 2020; Khalifatussadiah, 2020; Masithoh, 2022). Comprehensive learning outcomes reflect holistic behavioral changes encompassing the cognitive, affective, and psychomotor domains (Lestari et al., 2021; Suprihatin & Manik, 2020; Yandi et al., 2023). In Islamic Religious Education (PAI) learning, the cognitive aspect demands the ability to analyze historical events, the affective aspect fosters pride and appreciation for Islamic heritage, while the psychomotor aspect emphasizes practical skills such as presentations or creative projects (Fidya et al., 2021; Nahdotun Nisa & Lisnawati, 2021; Noor, 2020; Qiptiyyah, 2020). Ideal learning outcomes condition students to actively participate, think critically, creatively, and confidently. The achievement of these outcomes is greatly influenced by the appropriateness of learning strategies, motivation, and the readiness of the learning environment (Astrini et al., 2021; Indrawan et al., 2022; Marantika, 2021; Nurtanto et al., 2021; Setianingsih et al., 2025).

However, this ideal condition has not been fully realized at Middle School 7 Krui. Building upon pre-research through observations and interviews with Islamic Religious Education (PAI) and Character Education (Culture) teachers, four main root causes were identified: (1) differences in students' understanding of the material, (2) monotonous learning processes, (3) limited use of technology due to reliance on conventional printed textbooks, and (4) low student motivation and concentration. These problems directly impact student learning outcomes, particularly when faced with conceptual history material. This gap in learning outcomes is particularly striking when analyzing students' cognitive levels from C1 to C6. At the lower-order thinking skills (LOTS) levels, C1 to C3, student performance is quite dominant, with an average correct answer rate ranging from 14 to 17, while incorrect answers are only 2 to 3. Conversely, a drastic decline begins at the C4 (analysis) level, where incorrect answers jump to 10 compared to 6 correct answers. The peak is at the Higher Order Thinking Skills (HOTS) levels, C5 (evaluation) and C6 (creation), where students' understanding declines sharply; at C5, there are only 4 correct answers compared to 13 incorrect ones, and at C6, there are only 2 correct answers compared to 15 incorrect ones. This empirical data underscores the need for innovative learning models that can train students' analytical and evaluative skills (Amalia & Pujiastuti, 2020; Rahmawati et al., 2022).

As a solution to address students' weak higher-order thinking skills at Middle School 7 Krui, the Predict-Observe-Explain (POE) learning model offers a promising approach. POE is a student-centred learning model that encourages independent knowledge construction (Amelia et al., 2021). Through this model, students are not directed to memorize, but rather are encouraged to propose tentative predictions (hypotheses) regarding a historical phenomenon based on their prior knowledge (Budi et al., 2021).

Furthermore, through the observation and verification phase, students are encouraged to reconstruct their thinking if there is a discrepancy between their initial prediction and the scientific facts found (Fitrianingsih et al., 2021).

Operationally, the implementation of the POE model in the classroom follows a well-structured syntax. The teacher begins the lesson by establishing a relevant topic of Islamic cultural history (Juniwati, 2020). In the Predict phase, students are encouraged to make logical predictions about the events or concepts presented. In the Observe stage, students conduct independent or group investigations to test the validity of their predictions (Mallombasi & Sayidiman, 2023). Entering the Explain stage, students present arguments based on their observations and align them with their initial predictions, with the teacher acting as a mediator, correcting misconceptions and providing reinforcement (Marhento, 2020). This integrated process concludes with collective conclusions drawn to secure meaningful student understanding.

The theoretical advantages of the POE model in triggering motivation, reducing rote verbalism, and training critical reasoning have been widely validated by the literature (Anggraini et al., 2023; Lusiana et al., 2020; Murtihapsari et al., 2022; Noor et al., 2023; Paoliana et al., 2020; Prasetiyaningsih, 2020; Wulandari et al., 2022). However, the novelty of this research lies in the integration of Padlet interactive digital media into the POE syntax for Islamic Religious Education subjects at the junior high school level. Referring to previous studies (Zega, 2024; Adeulliah, 2023), the implementation of POE has been largely limited to exact science subjects such as science, physics, and social studies from elementary to high school levels. This study breaks this limitation by implementing the Padlet-assisted POE model in Islamic Religious Education (PAI) materials to accommodate the limitations of schools' digital resources and to specifically test its effectiveness in improving higher-order reasoning (C5 and C6).

Given the critical nature of students' reasoning problems at Middle School 7 Krui, research into the impact of the Padlet-based POE learning model is highly urgent. Without interactive strategic interventions, student boredom in learning Islamic history will persist and hinder the achievement of their multidimensional learning outcomes. The theoretical and practical implications of this research are expected to provide a concrete contribution in the form of a blueprint for innovative learning strategies for Islamic Religious Education teachers. Thus, the process of reconstructing the narrative of Islamic cultural history is no longer merely a passive memorisation activity but rather a means for students to hone their critical, analytical, and applicable historical thinking skills.

2. METHOD

This study employed a quantitative approach with a quasi-experimental approach. The research design employed a post-test-only control group design. This design measures the effect of the independent variable, the learning model, exclusively at the end of the treatment period using a post-test, without any pre-test. This approach was chosen to objectively evaluate differences in cognitive learning outcomes between the

group receiving the innovative intervention and the group taught with the conventional approach.

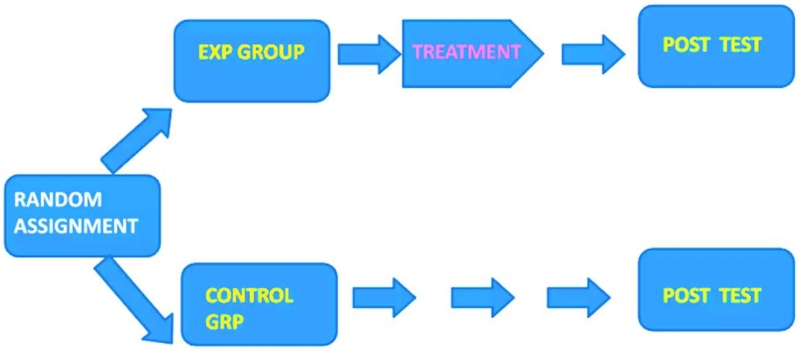

Figure 1. Post-Test-Only Control Group Design

The target population for this study included all eighth-grade students at Middle School 7 Krui, spread across several classes, totaling 93 students. Sampling was conducted using simple random sampling after ensuring homogeneity of the population characteristics. Based on this technique, two classes were selected as the study sample: class VIII B as the experimental group receiving the new intervention model, and class VIII A as the control group representing regular learning.

The initial phase of the research focused on developing learning materials and data collection instruments. Researchers developed a framework for the Islamic Religious Education (PAI) learning outcome test instrument specifically for higher cognitive levels, namely levels C5 (evaluation) and C6 (creation), based on Bloom's Taxonomy. Before being used for real-world data collection, all objective multiple-choice questions were empirically tested for their feasibility through validity tests, reliability estimates, difficulty level analysis, discriminatory power, and distractor effectiveness (distractor analysis) to ensure the quality and accuracy of the assessment instrument.

During the treatment implementation phase, the Predict-Observe-Explain (POE) learning model was systematically integrated in the experimental group. Learning began with the teacher presenting historical problems or phenomena related to the History of Islamic Culture (ISC) material to stimulate students' critical reasoning. Entering the Predict phase, students were encouraged to formulate tentative assumptions or logical hypotheses along with supporting arguments based on their prior knowledge schema regarding the issue.

Next, learning moved to the Observe and Explain phases. Students conduct direct investigations and observations through demonstration activities or analysis of digital historical documents to test the accuracy of their initial predictions. All observation results were recorded, compared, and discussed in groups. In the final phase, the teacher facilitated students in presenting scientific explanations of the causality of phenomena based on valid theories/concepts, drawing essential conclusions, and providing conceptual reinforcement to reduce misconceptions.

After the entire treatment session was completed for both groups, a final evaluation was conducted by distributing a high-level evaluation post-test instrument to both the

experimental and control groups. The quantitative data obtained from the post-test results were analyzed using a series of inferential statistical tests. The testing began with prerequisite analysis tests, including normality tests (using the Liliefors method) and homogeneity of variance tests (using the Bartlett method). The final step was hypothesis testing using an Independent Sample t-test to determine the significance of differences in learning outcomes between the two groups, which served as the primary basis for drawing the research conclusions.

3. RESULTS AND DISCUSSION

Results

This quasi-experimental research was conducted at Middle School 7 Krui by applying objective instrument-based data collection techniques in the form of multiple-choice tests designed to measure students' higher-order thinking skills. To ensure the validity of statistical conclusions, the learning outcome data obtained from the instrument were then analyzed through a series of prerequisite tests and inferential tests, which included a normality test to see the distribution of data, a homogeneity test to check the equality of group variances, and a t-test to test the significance of differences in learning outcomes between the experimental group and the control group, all of which results are presented comprehensively below.

Table 1. Results of Data Normality Test

Variable	Group	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistics	df	Sig.	Statistics	df	Sig.
Results	1	0.195	24	0.019	0.93	24	0.096
	2	0.19	24	0.026	0.912	24	0.039

The results of the normality test in the SPSS calculation table obtained the following interpretation: in the experimental and control groups, the significance values of the Kolmogorov-Smirnov and Shapiro-Wilk tests were 0.096 and 0.039, respectively. The value in the experimental group was greater than 0.05 (> 0.05), while in the control group it was less than 0.05 (< 0.05). This indicates that the data in the experimental group were normally distributed, while the data in the control group were not normally distributed. Because the control group did not meet the assumption of normality, further analysis used a nonparametric test, namely the Mann-Whitney Test, as follows:

Table 2. Mann-Whitney U Test Results

Test Statistics	Value
Mann-Whitney U	192.5
Wilcoxon W	492.5
Z	-2.049
Asymp. Sig. (2-tailed)	0.04

The results of the test obtained a Mann-Whitney U value of 192.500 with a significance value of 0.040. This significance value, which is less than 0.05 (<0.05), indicates a significant difference between the experimental group and the control group.

Table 3. Results of the Homogeneity of Variance Test

Variable	Homogeneity Criteria	Levene Statistic	df1	df2	Sig.
Result	Based on Mean	0.038	1	46	0.847
	Based on Median	0.035	1	46	0.852
	Based on Median and with adjusted df	0.035	1	45.307	0.852
	Based on trimmed mean	0.014	1	46	0.908

The results of the homogeneity of variance test (Levene's Test) in Table 3 obtained significance values (Sig.) for several approaches, namely 0.847 (based on mean), 0.852 (based on median), 0.852 (median with adjusted df), and 0.908 (trimmed mean). All significance values are greater than 0.05 (> 0.05). This indicates that the data variance between the experimental and control groups is homogeneous. In other words, the distribution of data from both groups has a relatively equal level of diversity.

Table 4. Results of the Independent Samples t-Test

Variable	Variance Assumption	Levene's Test		t-test for Equality of Means			Mean Difference	Std. Error Difference	95% Confidence Interval	
		F	Sig.	t	df	Sig. (2-tailed)			Lower	Upper
Result	Equal variances assumed	0.038	0.847	-2.235	46	0.03	-0.7083	0.317	-1.3464	-0.0703
	Equal variances not assumed			-2.235	45.014	0.03	-0.7083	0.317	-1.3467	-0.0699

The results of the homogeneity of variance test using Levene's Test obtained a significance value (Sig.) of 0.847. Because the p-value = 0.847 > 0.05, the assumption that the data variance between the two groups of research subjects is equal or homogeneous has been met. The methodological consequence of meeting this homogeneity assumption requires that the interpretation of the data in the t-test refers to the first row, namely Equal variances assumed.

Referring to the Equal variances assumed row in the Independent Samples t-test, a t-value of -2.235 was found with degrees of freedom (df) = 46 and a significance value of Sig. (2-tailed) of 0.030. Because the p-value = 0.030 < 0.05, the null hypothesis (H_0) is statistically rejected and the alternative hypothesis (H_a) is accepted. These inferential results conclusively prove that there is a significant difference in student learning outcomes between the experimental class using the new learning model and the control class using the conventional method. Thus, it can be concluded that the applied learning

model has a significant influence on the variables tested, so that it can support the research hypothesis that there is a significant difference between the experimental group using a certain learning model and the control group using conventional learning methods.

Discussion

Methodological Implications and Justification for Statistical Test Selection

This quasi-experimental study conducted at Middle School 7 Krui aimed to measure the effect of a new learning model on students' Higher Order Thinking Skills (HOTS). Before drawing inferential conclusions, a series of comprehensive data analysis prerequisite tests were conducted to ensure the validity of the statistical findings and avoid Type I errors (false positives). These prerequisite tests are crucial in quasi-experimental designs because sampling is not random (non-random assignment), requiring careful mapping of the data distribution characteristics before evaluating the intervention. This initial data exploration step aligns with the methodological recommendations of Rubin and Donkin (2024), who emphasize that the accuracy of hypothesis testing in educational research is highly dependent on meeting basic statistical data assumptions.

A methodological dilemma arose during the normality test, where the Shapiro-Wilk test results (Table 1) indicated asymmetric distribution deviations between groups. The experimental group data were normally distributed ($p = 0.096 > 0.05$), but the control group data showed a significantly non-normal distribution ($p = 0.039 < 0.05$). This non-normality in one of the groups has important consequences because it violates the basic assumptions of parametric statistics such as the Independent Samples t-test. In response to this situation, the researchers appropriately took the precautionary step of switching to the non-parametric Mann-Whitney U test as the primary inferential analysis. This decision is supported by studies by Creswell and Creswell (2017), which stated that when the normality assumption is violated in one of the sample groups, the Mann-Whitney U test is the best and most robust alternative for comparing two independent groups without distorting the study's significance values.

On the other hand, the second prerequisite parameter showed ideal results through the homogeneity of variance test using Levene's Test (Table 3). The mean-based significance value obtained of 0.847 ($p > 0.05$) empirically confirms that the data variance between the experimental and control groups is homogeneous. The fulfillment of this homogeneity assumption proves that both groups of subjects have an equal level of initial diversity or variability characteristics before the intervention is given. According to the experimental design theory by Montgomery and Silvestrini (2018), stable homogeneity of variance ensures that the differences in post-test scores that later appear truly represent the pure effect of the new learning model being tested, not due to bias from the inequality of internal variability that existed from the beginning in the student sample at Middle School 7 Krui.

Convergence of Data Analysis Results

Interestingly, the data analysis in this study employed a complementary approach by simultaneously presenting two inferential analyses: a nonparametric test (Mann-Whitney U Test) and a parametric test (Independent Samples t-Test). This step was taken as a confirmatory strategy to assess the consistency of the estimated direction and significance of the learning model's effects. Based on the test results, both statistical methods yielded fully convergent and consistent conclusions, rejecting the null hypothesis (H_0). This pattern of convergence between tests aligns with the methodological perspective of Schmidt (2015), who stated that statistical triangulation through simultaneous parametric and nonparametric tests can minimize interpretation uncertainty and strengthen the basis for inferential conclusions in quasi-experimental research.

Specifically, the Mann-Whitney U-test yielded a U value of 192.5 with a significance coefficient of $p = 0.040$ ($p < 0.05$), confirming a statistically significant difference in HOTS scores between the experimental and control groups. Meanwhile, supporting analysis using the Independent Samples t-Test in the Equal variances assumed row showed a t value of -2.235 at df = 46 with a p value of 0.030 ($p < 0.05$). The empirical findings from these two tests consistently demonstrate that the new learning model intervention has a significant impact on improving students' higher-order thinking skills compared to the control class using the conventional model.

Although the control group strictly violated the normality assumption, presenting the t-test data in this context serves as a valuable robustness check. The t-test's flexibility to minor violations of the normality assumption at specific sample sizes has been extensively validated in previous Monte Carlo simulation studies, such as those described by Signoret and Leroy (2021), which shows that the t-test maintains stable statistical power as long as homogeneity of variance is met. The very close convergence of results between the nonparametric ($p = 0.040$) and parametric ($p = 0.030$) tests provides crucial evidence that the differences in HOTS abilities found are valid and consistent, and not a statistical artifact or mathematical error due to the selection of only one type of test instrument.

The Substantial Impact of Padlet-Based POE on Enhancing Higher-Order Learning Outcomes in PAI

Substantially, the rejection of the null hypothesis (H_0) in this study conclusively proves that the implementation of the Padlet-based Predict-Observe-Explain (POE) learning model has a statistically significant effect on students' higher-order learning outcomes in Islamic Religious Education (PAI) and Character Education compared to conventional methods. This superior academic performance is empirically demonstrated by a mean difference value of -0.7083 in the t-test, indicating a significant and consistent disparity in achievement between the two groups. This finding reinforces previous research by Eagleton (2017) and Tiruneh et al. (2018), which posits that systematically designed instructional interventions—particularly those integrating digital scaffolding—are far more effective in accelerating students' complex cognitive abilities

and affective internalization than allowing these traits to develop naturally through routine, passive learning.

The success of the Padlet-based POE model in outperforming conventional methods at Middle School 7 Krui underscores the effectiveness of its syntactic structure in stimulating students' critical, analytical, and reflective reasoning within the context of PAI. The Predict stage forces students to independently analyze modern religious and moral dilemmas based on prior knowledge. The Observe stage, facilitated by Padlet's real-time multimedia walls, allows students to scrutinize authentic learning materials, video cases, or textual proofs (dalil). Finally, the Explain stage encourages public articulation of their synthesis. A research instrument specifically designed to measure these advanced learning outcomes through a structured test proved that these adaptive steps successfully triggered higher-order cognitive indicators, including analytical skills (C4), evaluation (C5), and creation (C6) of moral arguments. These instructional characteristics align with Bloom's Revised Taxonomy (Widiana et al., 2023) and a study by Jasper-Abowei and Victor-Ishikaku (2023), confirming that learning strategies emphasizing digital contextual problem-solving significantly shift students' focus from rote memorization of religious facts to actively constructing meaning and evaluating ethical solutions.

Furthermore, this stark disparity in cognitive and character learning outcomes is rooted in fundamental differences in student engagement and digital collaboration. While conventional PAI classrooms tend to be stuck in a teacher-centered approach that relies on one-way information transfer, the Padlet-based POE model provides an interactive, transparent arena for students to explore independently, collaborate, and engage in peer discussions. The digital wall of Padlet accommodates diverse student responses simultaneously, ensuring that every student actively contributes to the Predict and Explain phases. This transformation of students' roles from passive recipients to active moral agents is at the heart of Vygotsky's social constructivism theory (Lima, 2017; Zajda, 2025). In this perspective, the collaborative problem-solving and peer reflections mediated by the Padlet platform act as instructional scaffolding. This digital scaffolding facilitates students to reach their Zone of Proximal Development (ZPD), enabling them to master complex conceptual understandings and resolve abstract ethical dilemmas in PAI that were previously difficult to achieve independently (Raslan, 2024).

Overall, the statistical and theoretical analyses provide strong empirical evidence that the Padlet-based POE learning model is highly worthy of consideration as an innovative instructional approach to accelerate cognitive and affective learning outcomes in PAI at the secondary school level. As a recommendation for future research, investigators are advised to integrate a mixed-methods approach by delving into qualitative aspects in depth—such as tracking changes in students' daily character/behaviour or exploring digital engagement metrics on Padlet through interviews and observations—to identify which specific syntax of POE contributes most significantly to character reinforcement. Furthermore, stricter methodological controls are needed for confounding variables, such as variations in students' digital literacy and classroom dynamics during the

intervention, to minimize external bias while ensuring optimal homogeneity and normality of data distribution across all sample groups.

4. CONCLUSION

The implementation of the Padlet-based Predict-Observe-Explain (POE) learning model has a positive and significant effect on improving student learning outcomes in Islamic Religious Education (PAI) and Character Building subjects at Middle School 7 Krui. Empirical evidence shows a significant difference in learning outcomes between the experimental and control classes, which is supported by a t-test significance value of 0.030 and a Mann-Whitney test of 0.040 ($p < 0.05$). The integration of Padlet interactive digital media into the POE syntax—which includes the stages of prediction, observation, and explanation—has proven effective in stimulating student activity, motivation, and conceptual understanding. Specifically, this learning model is able to bridge the gap in understanding and accelerate students' higher-order thinking skills (HOTS) in the domains of analysis, evaluation, and creation (C4 to C6). Thus, the Padlet-based POE model can be an alternative learning strategy that is innovative, varied, and effective in reducing monotonous learning and optimizing student academic outcomes at the secondary school level.

As a recommendation, it is recommended that Islamic Religious Education (PAI) and Character Education (Culture) teachers begin integrating the Padlet-based Predict-Observe-Explain (POE) learning model as an alternative learning strategy in the classroom to break down the monotonous lecture method and encourage active student engagement. The management of Middle School 7 Krui is expected to continue supporting the provision and optimization of digital technology-based facilities and infrastructure to facilitate interactive learning media innovations like this. Finally, for future researchers interested in studying similar topics, it is recommended to expand the research sample to include different PAI materials and measure the impact of this model on other student psychological variables, such as learning independence or collaborative skills.

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