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Focus-Explore-Reflect-Apply (FERA) Learning Model: Aqidah Akhlaq Learning Outcomes at Islamic Lower Secondary School

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ABSTRACT

Learning outcomes in Aqidah Akhlaq (Islamic creed and ethics) across Indonesian madrasahs are often constrained by traditional lecture-dominated instruction, leaving students struggling to master application-level cognitive skills (Cognitive Level C3). This study evaluated the efficacy of the Focus-Explore-Reflect-Apply (FERA) learning model—a constructivist framework adapted from science education—in enhancing student learning outcomes in Aqidah Akhlaq. A quantitative quasi-experimental design was conducted at an Islamic Lower Secondary School in East Lampung. Two intact seventh-grade classes with homogeneous baseline academic abilities were assigned to an experimental group taught via FERA (n=24) and a control group taught via conventional instruction (n=25). Data were collected using a validated 15-item objective test (Cronbach's $\alpha=.650$). Due to a non-normal score distribution in the experimental group (Shapiro-Wilk, $p=.011$), hypothesis testing was performed using the nonparametric Mann-Whitney U test. The results revealed a statistically significant difference between groups ($Z=-6.169$, $p<.001$), demonstrating that the FERA model yields significantly superior learning outcomes, particularly at the application level (C3). These findings suggest that adapting constructivist science-based models like FERA into Islamic education offers a promising pedagogical strategy to bridge cognitive application gaps in madrasah curricula.

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1. INTRODUCTION

Learning outcomes are the central indicator by which the success of instruction is judged, encompassing the cognitive, affective, and psychomotor domains (AlAfnan, 2025; Layali & Sohiah, 2020). In Islamic religious education, this tripartite view of achievement carries weight: a competent learner is expected not only to know religious teachings but also to internalize them as character and conduct (akhlaq) enacted in daily life (Mawaddah, 2023; Norlianti et al., 2024; Oktama et al., 2026; Zul et al., 2026). This orientation is textually grounded in the Qur'an (Q.S. Al-'Alaq: 1–5), in which the command to “read” is presented as the foundation of knowledge acquired through divine

instruction, establishing learning and the pursuit of knowledge as acts of worship rather than mere memorization.

Within the cognitive domain, Anderson and Krathwohl's revision of Bloom's taxonomy distinguishes six levels of cognitive processing – remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and creating (C6) – of which the application level is widely regarded as the pivotal bridge between theoretical understanding and real-world practice (Adhikari, 2024; Akbar et al., 2026; Darwazeh, 2018; Noushad, 2024; Sajidan et al., 2022). Weaknesses at this level are therefore of particular concern in religious education, where the aim of instruction is precisely the translation of doctrinal knowledge into ethical action.

A preliminary study at Islamic Lower Secondary School Ma'arif Fatahillah, Sindang Anom, East Lampung—comprising classroom observation, interviews with the Aqidah Akhlaq teacher, and a diagnostic test—identified several interrelated problems. First, and most acute, students' application-level (C3) performance was markedly weak: on the diagnostic instrument, incorrect responses at this level (17) considerably outnumbered correct ones (10), a pattern not observed at the remembering (C1) or creating (C6) levels, where correct responses dominated. Second, instruction remained dominated by one-directional lecturing, which offered students little opportunity for active participation or discussion. Third, variation in students' motivation and reasoning ability left some learners feeling left behind and lacking confidence. Fourth, external factors—limited parental support and inadequate learning facilities—further constrained students' concentration and enthusiasm. Fifth, the instructional media in use was insufficiently engaging to sustain interest. Collectively, these findings point to a clear instructional gap: a lecture-centered pedagogy that leaves the application of religious knowledge—arguably the most consequential learning outcome in Aqidah Akhlaq—underdeveloped.

One instructional response to this gap is the Focus-Explore-Reflect-Apply (FERA) learning model, developed by the National Science Resources Center (Budiman et al., 2018; Diani et al., 2020; Nurhalimah & Rizal, 2024; Ranialini et al., 2025) within a constructivist framework in which learners actively construct knowledge through direct experience and reflection rather than passive reception (Komarudin et al., 2022; Ranialini et al., 2024). The model comprises four sequential stages: (a) Focus, in which students clarify and connect prior knowledge to a relevant phenomenon, activating motivation for further learning; (b) Explore, in which students engage in hands-on investigation – observation, experimentation, inquiry, and interview – to test ideas and construct new concepts independently; (c) Reflect, in which students analyze and reprocess the information gathered during exploration to consolidate understanding; and (d) Apply, in which students transfer the concepts learned to everyday situations or novel problems, translating knowledge into practice (Budiman et al., 2019; Ranialini et al., 2025).

Empirical evidence on FERA is encouraging but has so far been concentrated in science and mathematics education. Rizal (2023) reported that a scientific-approach FERA model improved students' science process skills on dynamic-fluid material.

Komarudin et al. (2022) found that video-assisted FERA instruction significantly enhanced students' metacognitive ability and adaptive mathematical reasoning. Nurhalimah and Rizal (2024) demonstrated that FERA assisted by Crocodile Physics software improved students' critical thinking skills. In contrast, in one of the few studies situated in Islamic religious education, Raniah et al. (2024) found no significant difference between FERA and a conventional model in Islamic Religious Education (PAI) achievement, suggesting that the model's effectiveness may be sensitive to subject matter, implementation fidelity, and supporting media.

This mixed picture, together with the near-total absence of research testing FERA specifically within Aqidah Akhlaq instruction at the madrasah tsanawiyah (junior secondary) level, constitutes the gap this study addresses. Whereas prior applications of FERA have targeted procedural or scientific reasoning, Aqidah Akhlaq instruction additionally requires the internalization of belief and moral values – an outcome for which the Explore and Reflect stages, which invite students to revisit and make sense of religious concepts, and the Apply stage, which asks students to enact those concepts in daily conduct, may be particularly well suited.

Accordingly, this study asks: is the FERA learning model effective in improving the learning outcomes of Aqidah Akhlaq students at Islamic Lower Secondary School Ma'arif Fatahillah, particularly at the application (C3) cognitive level? We hypothesize that students taught with the FERA model will demonstrate significantly higher learning outcomes than those taught with a conventional, lecture-based approach. In addressing this question, the study contributes (a) empirical evidence on FERA's effectiveness outside its established STEM contexts, (b) a substantive extension of constructivist pedagogy into Islamic character education, and (c) practical guidance for teachers seeking to move Aqidah Akhlaq instruction beyond lecture-based delivery toward a more participatory, reflective, and applied approach.

2. METHOD

This study used a quantitative, quasi-experimental approach, in which the independent variable is manipulated but participants are not individually randomized to condition. Specifically, a Posttest-Only Control Group Design was employed: an experimental class received the FERA treatment while a control class received conventional instruction, after which both groups completed the same achievement test; the resulting scores were compared to evaluate the treatment's effect. The design can be summarized as follows: Experimental group, R – X – O; Control group, R – – O, where R denotes the (randomly selected) intact class, X denotes the FERA treatment, and O denotes the posttest score.

The population comprised all seventh-grade students at Islamic Lower Secondary School Ma'arif Fatahillah, Sindang Anom, East Lampung, distributed across three classes (n = 74). Using simple random sampling – in which every class had an equal probability of selection, implemented by a randomized class draw – two intact classes were selected: Class VII-A was assigned as the control group (n = 25), receiving

conventional lecture-based instruction, and Class VII-C was assigned as the experimental group (n = 24), receiving instruction with the FERA model.

Table 1. Population and sample distribution

Class	Number of students	Group
VII-A	25	Control (conventional instruction)
VII-B	25	Not sampled
VII-C	24	Experimental (FERA)
Total population	74	—

Learning outcomes were measured with a 15-item multiple-choice achievement test constructed according to Anderson and Krathwohl's cognitive taxonomy (C1–C6), with particular attention to the application (C3) level identified as the students' principal weakness. Content and construct validity were assessed using the Pearson product-moment correlation between each item score and the total score, with items considered valid when r -count exceeded the critical r -table value. Reliability was estimated using Cronbach's alpha, with $\alpha \geq .60$ taken as the threshold for acceptable internal consistency (Anggraini et al., 2022). Item difficulty was calculated as the proportion of correct responses per item ($P = \frac{B}{N}$), with items classified as difficult ($P \leq .30$), moderate (.31 – .70), or easy ($P \geq .71$). Item discrimination was estimated via the point-biserial correlation between item and total scores (with an item-discrimination criterion of $D \geq .30$ regarded as satisfactory), and distractor functioning was evaluated using a distractor-effectiveness index.

Prior to hypothesis testing, the assumptions of normality and homogeneity of variance were examined. Normality was assessed with the Shapiro-Wilk test (data considered normally distributed when $p > .05$), and homogeneity of variance was assessed with Levene's test (variances considered homogeneous when $p > .05$). Because the normality assumption was violated in one group (see Section 3), the Mann-Whitney U test – a nonparametric alternative to the independent-samples t-test – was used to test the hypothesis that posttest scores differed between the experimental and control groups, at a significance level of $\alpha = .05$. All analyses were conducted in SPSS.

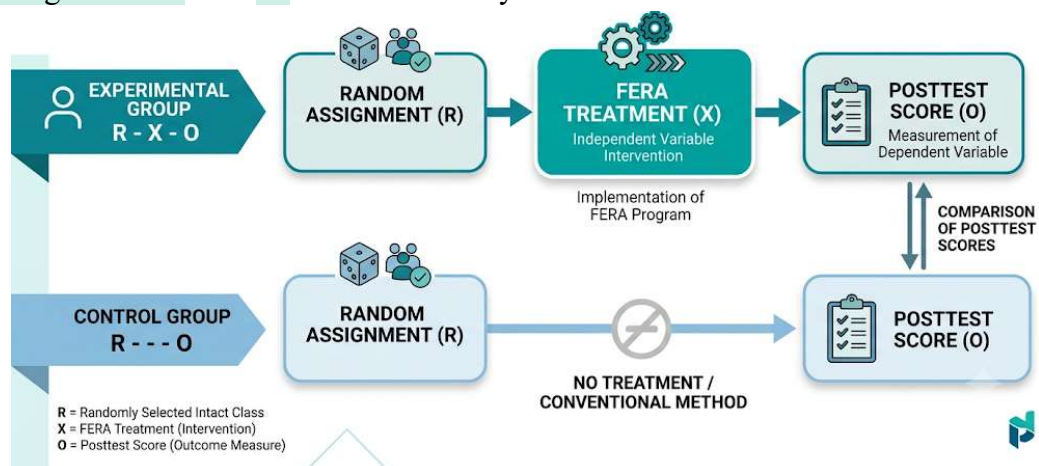


Figure 1. Pretest-Posttest Control Group Design

3. RESULTS AND DISCUSSION

Results

Instrument Validity and Reliability

To evaluate the structural integrity and construct validity of the measurement instrument, a Pearson product-moment correlation analysis was performed on the 15 original items against a critical threshold ($r_{\text{table}} = .344, \alpha = .05$). The preliminary psychometric evaluation revealed that 12 items demonstrated satisfactory item-total correlations, with calculated values (r_{count}) ranging from .353 to .512, thereby confirming their empirical validity. Conversely, three items—specifically Item 1 ($r = .012$), Item 2 ($r = .232$), and Item 14 ($r = -.142$)—failed to reach statistical significance and were subsequently omitted from the scale to maintain construct purity, as detailed in Table 2.

Following the elimination of the non-performing items, the revised 12-item scale was subjected to internal consistency testing using Cronbach's alpha (α). The resulting reliability coefficient was .650, which surpasses the widely accepted benchmark threshold of .60 for exploration and applied research instruments. This result confirms that the retained items exhibit an acceptable degree of inter-item correlation and collective cohesion, thereby establishing the final instrument as a psychometrically sound and reliable tool for subsequent empirical analysis.

Table 2. Item validity (Pearson product-moment correlation, N = 24)

Item	r-table	r-count	Status
1	0.344	0.012	Invalid
2	0.344	0.232	Invalid
3	0.344	0.483	Valid
4	0.344	0.407	Valid
5	0.344	0.463	Valid
6	0.344	0.430	Valid
7	0.344	0.483	Valid
8	0.344	0.431	Valid
9	0.344	0.408	Valid
10	0.344	0.353	Valid
11	0.344	0.494	Valid
12	0.344	0.431	Valid
13	0.344	0.512	Valid
14	0.344	-0.142	Invalid
15	0.344	0.382	Valid

Item Difficulty and Discrimination

Difficulty analysis showed that none of the 15 items fell into the “difficult” category; six items (2, 3, 6, 7, 10, and 13) were classified as easy and nine items (1, 4, 5, 8, 9, 11, 12, 14, and 15) as moderate. This distribution – dominated by moderate-to-easy items – is generally favourable for an achievement instrument, since moderately difficult items discriminate better between higher- and lower-ability students than items that are uniformly easy or uniformly hard.

Discrimination analysis, based on the corrected item-total correlation, indicated that overall item discrimination was weak: no items reached the “very good” (.70–1.00) or

“good” (.40–.69) categories; one item (item 6, $r = .392$) fell in the “sufficient” category (.20–.39); six items (2, 10, 11, 12, 13, and 15) fell in the “poor” category (.00–.19); and eight items (1, 3, 4, 5, 7, 8, 9, and 14) showed negative correlations, indicating “very poor” discrimination. This pattern indicates that, notwithstanding acceptable overall reliability, a substantial number of items require revision – through rewording, recoding of scoring keys, or realignment of answer keys – before the instrument is used in future research or instructional assessment.

Table 3. Item discrimination index

Discrimination category	Range	Number of items	Item numbers
Very good	0.70–1.00	0	–
Good	0.40–0.69	0	–
Sufficient	0.20–0.39	1	6
Poor	0.00–0.19	6	2, 10, 11, 12, 13, 15
Very poor	< 0.00	8	1, 3, 4, 5, 7, 8, 9, 14

Tests of Normality and Homogeneity

To evaluate the distribution characteristics of the post-intervention scores, a Shapiro–Wilk test of normality was conducted across both study conditions (Table 4). The empirical results indicated that scores within the experimental group utilizing the FERA model deviated significantly from a normal distribution ($p = .011$), whereas scores in the conventional control group satisfied the normality assumption ($p = .118$). Because the requirement of univariate normality was not met across both groups simultaneously, the dataset violated the core prerequisites for parametric inferential analyses, justifying the deployment of non-parametric hypothesis testing.

In addition to distributional assessment, the assumption of homoscedasticity was evaluated using Levene’s test for equality of variances. The analysis revealed that the variances between the experimental and control cohorts were statistically homogeneous ($p = .314$). Nevertheless, given the presence of non-normal distribution patterns within the FERA experimental group, non-parametric procedures (e.g., the Mann–Whitney U test) were selected as the most robust analytical approach to prevent inflation of Type I error rates while maintaining statistical integrity.

Table 4. Shapiro-Wilk Normality Test

Group	Shapiro-Wilk p	Distribution
Experimental (FERA)	0.011	Not normal
Control (conventional)	0.118	Normal

Hypothesis Testing

To determine the effectiveness of the intervention amidst the non-normal distribution of scores, a Mann–Whitney U test was performed on the post-test learning outcomes (Table 5). The analysis revealed a statistically significant difference between the experimental group instructed under the FERA framework and the control group receiving conventional instruction ($Z = -6.169, p < .001$). Consequently, the null hypothesis (H_0) of equal group distributions was rejected in favor of the alternative hypothesis (H_1). This result demonstrates that the implementation of the FERA teaching

model yielded a substantial positive shift in students' post-intervention performance relative to traditional pedagogical practices.

A detailed examination of the cognitive dimensions showed that the superiority of the experimental group was most pronounced at the application level (C3), which had previously been identified during the preliminary study as the primary area of academic deficit among students. By effectively targeting this specific cognitive bottleneck, the FERA intervention not only elevated overall academic achievement but also facilitated higher-order knowledge transfer. These empirical findings substantiate the efficacy of the FERA model as an impactful instructional strategy for bridging baseline cognitive gaps in complex learning domains.

Table 5. Mann-Whitney U test of posttest learning outcomes

Statistic	Value
Mann-Whitney U	significant
Z	-6.169
Asymp. Sig. (2-tailed)	0.000
Decision	H0 rejected; H1 accepted

Discussion

The results show that the FERA learning model produced a statistically significant improvement in students' Aqidah Akhlaq learning outcomes relative to conventional, lecture-based instruction, with the clearest gains at the application (C3) level – precisely the cognitive level identified as deficient in the preliminary diagnostic assessment. This finding suggests that models organized around exploratory and reflective activity can narrow the gap between theoretical understanding and practical application that lecture-based instruction, by design, leaves largely unaddressed.

The finding is broadly consistent with prior FERA research in other domains. Komarudin et al. (2022) reported that FERA significantly enhanced metacognitive ability and adaptive reasoning in mathematics, and the present study extends this pattern to a markedly different content domain – Islamic religious education – suggesting that FERA's constructivist mechanism generalizes beyond STEM subject matter. At the same time, the result stands in contrast to Raniah et al. (2024), who found no significant difference between FERA and conventional instruction in Islamic Religious Education (PAI). One plausible explanation for this divergence is subject-matter specificity: Raniah et al.'s study addressed general PAI content, whereas the present study targeted Aqidah Akhlaq specifically and concentrated instructional design on the application-level weakness diagnosed beforehand, which may have allowed the Apply stage of FERA to more directly target the outcome being measured. This divergence underscores that FERA's effectiveness is likely contingent on implementation fidelity, the specificity of the targeted cognitive outcome, and the degree of alignment between the model's stages and the subject matter's demands – an interpretation also consistent with Nurhalimah and Rizal (2024) and Rizal (2023), who observed strong effects when FERA was closely tailored to skill-specific outcomes (science process skills and critical thinking, respectively).

Theoretically, the pattern of results is well explained by a constructivist account of learning, in which students actively build understanding through direct experience rather than passive transmission (Bada & Olusegun, 2015; Gozum & Mendoza, 2026). Within FERA, the Explore and Reflect stages give students structured opportunities to revisit and reprocess religious concepts through discussion and comparison of ideas, while the Apply stage – arguably the most distinctive contribution of the model to religious education – asks students to internalize and enact Aqidah Akhlaq content in everyday conduct. In this sense, FERA functions not only as an instructional strategy for content mastery but also as a vehicle for the internalization of religious and moral values, aligning pedagogical process with the substantive goal of Islamic religious education.

The findings also resonate with the broader motivation literature: Bempechat and Shernoff (2012) and Katel (2023) both emphasize that adequate facilities, parental support, and methodological variety are central to sustaining student motivation and achievement. By requiring active participation and offering students the chance to test and discuss their own ideas, FERA appears to address the motivational deficit identified in the preliminary study, consistent with RimahDani et al.'s (2023) observation that varied methods and media increase student engagement.

For practice, these findings imply that Aqidah Akhlaq teachers can benefit from shifting away from one-directional lecturing toward instructional designs that deliberately balance exploration, reflection, and application. FERA offers a concrete, replicable structure for making this shift without requiring specialized technology or extensive resources, which may be particularly relevant for resource-constrained madrasah settings such as the one studied here.

Several limitations qualify for these conclusions. First, the quasi-experimental design used intact classes rather than individual random assignments, leaving open the possibility of pre-existing between-class differences not controlled by the design. Second, the sample was drawn from a single school and comprised only 49 students across two classes, which constrains statistical power and the generalizability of findings to other institutional and regional contexts. Third, item discrimination analysis revealed that most test items performed poorly, indicating that the achievement instrument requires further refinement – through item rewriting, rescoring, or replacement – before it is reused in subsequent research. Fourth, because the achievement measure captured only cognitive outcomes, the model's hypothesized contribution to affective and psychomotor dimensions of Akhlaq – arguably central to religious character education – remains untested in this study and warrants direct investigation.

4. CONCLUSION

This study evaluated the empirical efficacy of adapting the Focus-Explore-Reflect-Apply (FERA) learning model—a constructivist framework derived from STEM education—into Islamic religious instruction (Aqidah Akhlaq). Statistical analysis via the Mann-Whitney U test demonstrated a significant positive effect on students' posttest scores compared to conventional lecture-based instruction ($Z = -6.169$, $p < .001$), with

the most pronounced gains observed at the application cognitive level (Bloom's C3). These findings offer preliminary empirical evidence that structured inquiry, reflective reprocessing, and contextual application can effectively bridge the cognitive gap between theoretical religious doctrine and application-level comprehension in secondary madrasah curricula.

Theoretically, this research contributes to the broader educational discourse by illustrating that constructivist pedagogical models are not strictly bound to science and mathematics; when carefully aligned, their core mechanics can enhance cognitive processing within value-based and religious subjects. For instructional practice, the study suggests that Aqidah Akhlaq educators may leverage FERA as an active-learning alternative to traditional lectures to promote deeper conceptual application, particularly in resource-constrained classroom environments.

However, these conclusions must be interpreted within the context of several empirical constraints. Because student achievement was evaluated strictly through a 15-item cognitive test, the findings reflect cognitive application mastery (C3) rather than the direct internalization of affective values or real-world behavioral ethics (akhlaq). Furthermore, given the small sample size (N=49), single-school setting, and reliance on an intact-class quasi-experimental design without a pretest, generalizability remains limited. Future research should deploy larger, multi-site randomized controlled trials, incorporate longitudinal observation of affective and psychomotor outcomes, and evaluate FERA's integration with digital media to provide a more comprehensive assessment of constructivist models in character education.

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