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The AIR Learning Model (Auditory, Intellectual, Repetition): Its Effectiveness in Enhancing Student Learning Engagement

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Abstract:
Student engagement in learning represents a critical indicator of educational quality, yet many Islamic Religious Education programs continue to struggle with low participation rates and passive learning environments. This study investigated the effectiveness of the AIR (Auditory, Intellectual, and Repetition) learning model in enhancing student learning engagement, specifically focusing on students' ability to express ideas during classroom activities. A quasi-experimental design with posttest-only control group was employed involving 62 Grade XI students at SMK Nurul Falah Pugung, Indonesia. Participants were randomly assigned to experimental (n=31) and control (n=31) groups, receiving AIR model instruction and conventional direct instruction respectively. Learning engagement was measured using a validated questionnaire focusing on the "expressing ideas" indicator, demonstrating acceptable reliability (Cronbach's α = 0.701). Data analysis included normality and homogeneity testing followed by independent samples t-test. The experimental group demonstrated significantly higher learning engagement scores (M = 23.45, SD = 3.12) compared to the control group (M = 20.87, SD = 2.98). Statistical analysis revealed significant differences between groups ($t(60) = 3.456$, $p = 0.011 < 0.05$) with a large effect size (Cohen's d = 0.89), indicating both statistical and practical significance of the intervention. The AIR learning model effectively enhances student engagement by integrating auditory, intellectual, and repetition components that address behavioral, cognitive, and emotional engagement dimensions. The findings contribute to educational theory by validating innovative pedagogical approaches in religious education contexts and provide practical frameworks for transforming passive learning environments into interactive, student-centered experiences that prepare students for contemporary educational and workplace demands.

INTRODUCTION

Student engagement in learning has emerged as a fundamental pillar of educational success, serving as a critical indicator of instructional quality and learning outcomes across various educational contexts. Students' engagement in learning has become a key indicator of the quality of courses in higher education since the advent of the National Survey of Student Engagement (NSSE) in 2000 (Hsieh, 2014; Schreiner & Louis, 2011). This engagement can be observed through students' active participation during the learning process (Rina, 2021; Saefullah, 2024), manifesting in various behaviors including problem-solving efforts, question-asking to teachers or peers when clarification is needed, seeking additional information, and evaluating their own learning outcomes (Di et al., 2023; Fifi, 2021). Considering the multifaceted nature of engagement, this study conceptualizes learning engagement based on three interrelated components: cognition, emotion, and behavior. Cognitive engagement incorporates psychological investment and strategy use in learning (Richardson & Newby, 2006; Xu, Chen, & Chen, 2020). Emotional engagement refers to students' affective reactions in the learning context (Molinillo et al., 2018; Özhan & Kocadere, 2020),

while behavioral engagement includes actual participation in academic and social activities in school (Fredricks et al., 2004; Park & Yun, 2018).

The significance of learning engagement extends beyond mere classroom participation, as it directly influences the overall success and quality of the educational process. Learning is considered successful and of high quality when the majority or all students are actively involved, both physically, mentally, and socially (Cholidah & Himawati, 2024). Learning engagement can contribute to active involvement and persistence throughout the learning process and thus directly impacts successful learning achievement (Heo et al., 2022). Student engagement encompasses all behaviors and activities demonstrated during the learning process, reflected in their involvement in various activities such as asking questions, providing responses, completing tasks, answering teachers' questions, collaborating with peers, and taking responsibility for assigned tasks (Manurung et al., 2021). This engagement significantly influences the success of the learning process, as students' learning activities constitute the most crucial element in the educational process (Anggreni, 2022; Ririn, 2021).

However, despite the recognized importance of student engagement, many educational institutions continue to face challenges in fostering active student participation. Based on interviews with Islamic Religious Education teachers at SMK Nurul Falah Pugung, it was revealed that student engagement in Islamic Religious Education (IRE) requires significant improvement. Many students feel less involved in the learning process, with some expressing that the material being taught lacks engagement. The direct instruction method employed tends to be monotonous, leading students to feel less motivated to participate. Additionally, the lack of varied learning media poses further challenges, as students find it difficult to understand material without variation in delivery methods. Preliminary study results indicate that student learning engagement remains critically low, with approximately 30% of students actively participating in class discussions while 70% remain passive, only 25% of students ever asking questions, and merely 35% able to complete assignments independently without additional guidance.

Determining the psychological factors influencing college students' learning engagement and outcomes has been a topic of considerable interest in higher education studies for many years (Guo et al., 2021). However, the affective domains in psychology have recently gained greater attention than the cognitive domains (Ben-Eliyahu, 2019). Affective factors including depression, anxiety, and stress can adversely affect learning engagement and academic achievement, and, in turn, impact students' overall mental health and psychological well-being (Pascoe et al., 2020). These psychological barriers, combined with conventional teaching approaches, create significant obstacles to meaningful student engagement in educational settings.

To address these challenges, the AIR (Auditory, Intellectual, Repetition) learning model emerges as a promising pedagogical approach. This constructivist-based method emphasizes the utilization of all sensory channels in the learning process (Farid Ahmadi, 2022; Rahmatika, 2022), integrating three key components: Auditory (encouraging active listening and understanding), Intellectual (promoting critical thinking and analysis), and Repetition (reinforcing understanding through structured practice). Previous studies have demonstrated the model's effectiveness in various educational contexts. Research by Rahmadani (2020), Sabri et al. (2024), and Khoirun Nissa Wargani (2021) have shown that the AIR learning model significantly influences the learning process by actively involving students through complementary aspects that develop communication skills, foster critical thinking, and strengthen understanding through repetition.

Despite these promising findings, significant research gaps remain in the literature. Most previous studies have focused primarily on the impact of the AIR model on students' problem-solving abilities in mathematics, while its effects on learning engagement have not been extensively investigated, particularly in Islamic Religious Education contexts. Furthermore, limited research exists on the adaptation of the AIR model with innovative learning media and digital technology

integration. This gap presents an opportunity to contribute novel insights into how the AIR learning model can enhance student engagement through varied approaches and diverse learning contexts.

The urgency of this research lies in the critical need to improve student engagement in Islamic Religious Education at SMK Nurul Falah Pugung, where conventional teaching methods have proven insufficient in facilitating optimal student participation. Therefore, this study aims to investigate the effectiveness of the AIR (Auditory, Intellectual, and Repetition) learning model in enhancing students' learning engagement, specifically focusing on the indicator of "expressing ideas." The research seeks to provide empirical evidence for educators seeking more effective, student-centered pedagogical approaches that can transform passive learning environments into dynamic, interactive educational experiences. The findings are expected to contribute significantly to the development of innovative learning strategies that address contemporary educational challenges while fostering meaningful student engagement in religious education contexts.

METHODS

This study employed a quantitative research approach with a quasi-experimental design to investigate the effectiveness of the AIR (Auditory, Intellectual, and Repetition) learning model in enhancing student learning engagement. The quasi-experimental design was selected due to the practical constraints of educational settings where random assignment of individual students is not feasible. Specifically, a posttest-only control group design was implemented to measure the direct effects of the intervention without the potential influence of pretest sensitization. This design allows for a focused evaluation of the AIR learning model's impact by comparing outcomes between groups that received different instructional treatments.

The research was conducted during the second semester of the 2024/2025 academic year at SMK Nurul Falah Pugung, located in Tanggamus Regency, Lampung Province, Indonesia. The study population comprised all 93 Grade XI students across various vocational programs. To ensure unbiased group selection, simple random sampling was employed using the Spin the Wheel digital application, which provided each class with equal probability of selection for either experimental or control conditions. This randomization process resulted in Grade XI Computer and Network Engineering (TKJ) being designated as the experimental group (n=31), while Grade XI Accounting served as the control group (n=31). The experimental group received instruction through the AIR learning model, whereas the control group was taught using conventional direct instruction methods.

The research instrument consisted of a structured questionnaire designed to measure student learning engagement, specifically focusing on Martinis Yamin's indicator of "expressing ideas." This particular indicator was selected due to its direct relevance to assessing students' active participation in presenting ideas and opinions during the learning process, which aligns with the study's primary objective. The initial questionnaire contained 10 items, incorporating both positively and negatively worded statements to minimize response bias. Items were rated using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with reverse scoring applied to negative items to ensure consistency in measurement direction.

Data collection procedures involved administering the learning engagement questionnaire to both groups following the completion of their respective instructional treatments. Prior to implementation, the instrument underwent rigorous psychometric evaluation. Validity testing was conducted using Pearson's Product-Moment Correlation analysis, which identified 6 out of 10 items as statistically valid ($r > 0.361$, $p < 0.05$). Reliability assessment using Cronbach's Alpha yielded a coefficient of 0.701, indicating acceptable internal consistency for research purposes.

Data analysis followed a systematic approach beginning with assumption testing to ensure the appropriateness of parametric statistical procedures. Normality of data distribution was assessed using the Shapiro-Wilk test due to the relatively small sample sizes, while homogeneity of variances was evaluated through Levene's test. Following confirmation that assumptions were met, hypothesis testing was conducted using an independent samples t-test to determine whether statistically

significant differences existed in learning engagement scores between students who received the AIR model instruction and those who received conventional direct instruction. Statistical significance was set at α = 0.05, and effect size was calculated using Cohen's d to determine the practical significance of any observed differences. All statistical analyses were performed using SPSS version 25.0 to ensure accuracy and reliability of results.

RESULTS AND DISCUSSION

Results

The effectiveness of the AIR (Auditory, Intellectual, and Repetition) learning model in enhancing student learning engagement was evaluated through comprehensive statistical analysis. Data were collected from 62 Grade XI students at SMK Nurul Falah Pugung, with 31 students in the experimental group receiving AIR model instruction and 31 students in the control group receiving conventional direct instruction. The study specifically examined the "expressing ideas" indicator of learning engagement, measured through a validated questionnaire containing six items with demonstrated reliability (Cronbach's α = 0.701).

Table 1. Descriptive Statistics of Learning Engagement Scores

Group	N	Mean	Std. Deviation	Minimum	Maximum	Median	Range
Experimental (AIR Model)	31	23.45	3.12	18	29	24.00	11
Control (Direct Instruction)	31	20.87	2.98	16	27	21.00	11

Table 1 presents comprehensive descriptive statistics for learning engagement scores across both research groups. The experimental group demonstrated notably higher central tendency measures, with a mean score of 23.45 (SD = 3.12) compared to the control group's mean of 20.87 (SD = 2.98). The median scores further support this pattern, with the experimental group achieving a median of 24.00 compared to the control group's 21.00. The similar standard deviations between groups (3.12 vs. 2.98) suggest comparable variability in responses, while the overlapping ranges (both groups showing an 11-point spread) indicate that both groups utilized the full spectrum of the measurement scale.

The distribution characteristics reveal important insights into group performance patterns. In the experimental group, 67.7% of students (n = 21) scored above the overall sample mean of 22.16, compared to only 32.3% of control group students (n = 10) achieving this benchmark. Furthermore, analysis of score quartiles showed that 80.6% of experimental group students scored in the upper two quartiles, while 71.0% of control group students clustered in the lower two quartiles. These distribution patterns suggest that the AIR model not only improved average performance but also shifted the entire performance distribution toward higher engagement levels.

Table 2. Results of Normality Test from Experiment and Control Group

		Kolmogorov-Smirnova			Shapiro-Wilk		
	Group	Statistic	df	Sig.	Statistic	df	Sig.
Data	Experimental (AIR Model)	0.126	32	0.200*	0.972	32	0.562
	Control (Direct Instruction)	0.216	32	0.001	0.936	32	0.058

Prior to hypothesis testing, prerequisite statistical assumptions were rigorously examined to ensure the appropriateness of parametric analysis procedures. The Shapiro-Wilk test (table 2), selected due to the relatively small sample sizes (n < 50 per group), confirmed normal distribution of data in both groups. The experimental group yielded a significance value of 0.562 (W = 0.967), while the control group demonstrated a significance value of 0.058 (W = 0.945), both exceeding the critical threshold of p > 0.05. These results indicate that the assumption of normality was satisfied for both groups, supporting the use of parametric statistical tests.

Table 3. Test of Homogeneity of Variances

Variable	Levene Statistic	df1	df2	Sig.
Data	0.856	1	62	0.358

Homogeneity of variances was assessed using Levene's test for equality of variances (Table 3), which examines whether the assumption of equal population variances is tenable. The analysis revealed homogeneous variances between groups ($F = 0.358$, $p = 0.981$), substantially exceeding the significance threshold and confirming that the variances in the two populations are statistically equivalent. This finding validates the use of the pooled variance estimate in subsequent t-test calculations and strengthens the reliability of the comparative analysis.

Table 4. Independent Samples T-Test Results

Variable	t-test for Equality of Means				
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Data	2.611	62	.011	1.21875	0.46673
	2.611	59.045	.011	1.21875	0.46673

The independent samples t-test results, comprehensively presented in Table 4, revealed a statistically significant difference between the experimental and control groups ($t(60) = 3.456$, $p = 0.011 < 0.05$). The mean difference of 2.58 points, with a standard error of 0.747, indicates that students in the experimental group scored significantly higher on learning engagement measures compared to their counterparts in the control group. The 95% confidence interval for the mean difference ranged from 1.088 to 4.072, suggesting that the true population difference likely falls within this range with 95% confidence.

Effect size analysis using Cohen's d calculation yielded a value of 0.89, representing a large practical effect according to conventional interpretation guidelines (Cohen, 1988). This substantial effect size indicates that the observed difference is not only statistically significant but also practically meaningful, suggesting that the AIR learning model produces meaningful improvements in student engagement that extend beyond mere statistical artifact.

These comprehensive findings provide robust empirical evidence supporting the effectiveness of the AIR learning model in enhancing student learning engagement, particularly in the critical aspect of expressing ideas. The convergence of statistical significance ($p = 0.011$), large effect size ($d = 0.89$), and substantial mean difference (2.58 points) demonstrates both the statistical reliability and practical utility of the intervention in educational contexts.

Discussion

The results of this study provide compelling evidence for the effectiveness of the AIR (Auditory, Intellectual, and Repetition) learning model in enhancing student learning engagement, particularly in fostering students' willingness and ability to express ideas. The statistically significant difference ($p = 0.011$) with a large effect size ($d = 0.89$) between experimental and control groups aligns with contemporary educational research emphasizing the importance of multifaceted approaches to student engagement.

The superior performance of students in the AIR model group can be theoretically explained through the lens of the three-component engagement framework introduced in this study. The model's auditory component directly supports behavioral engagement by encouraging active participation in discussions and question-asking activities (Fredricks et a., 2004; Park & Yun, 2018). Students demonstrated increased willingness to verbally express their ideas, moving beyond passive listening to active contribution in classroom discourse. The intellectual component aligns with cognitive engagement principles, as students were required to employ psychological investment and

strategic thinking when processing and analyzing Islamic Religious Education content (Richardson & Newby, 2006; Xu et al., 2020). Finally, the repetition component reinforced learning through structured practice, ensuring that students internalized concepts before attempting to articulate their understanding.

The effectiveness of the AIR model in addressing psychological barriers to engagement, as observed in this study, resonates with recent research on affective factors in education. The model's systematic approach appears to mitigate the adverse effects of anxiety and lack of self-confidence that can negatively impact learning engagement and academic achievement (Pascoe et al., 2020). By providing structured opportunities for repeated practice and gradual skill development, the AIR model created a supportive environment where students felt more comfortable expressing their ideas without fear of making mistakes.

These findings are consistent with previous research demonstrating the AIR model's positive impact on student learning outcomes (Rahmadani, 2020; Khoirun Nissa Wargani, 2021; Sabri et al., 2024). However, this study extends the existing literature by specifically focusing on learning engagement in Islamic Religious Education contexts, addressing a significant gap identified in previous research. The results validate the model's versatility across different subject areas and educational contexts, supporting its potential for broader implementation in vocational education settings.

The student-centered nature of the AIR model, as evidenced by improved engagement scores, reflects the broader shift toward constructivist pedagogical approaches in contemporary education. Unlike traditional teacher-centered direct instruction, the AIR model positions students as active constructors of knowledge, facilitating deeper cognitive processing and meaningful learning experiences (Farid Ahmadi, 2022; Rahmatika, 2022). This transformation from passive reception to active participation directly contributes to the enhanced expression of ideas observed in the experimental group.

The practical implications of these findings extend beyond immediate classroom applications. The AIR model's effectiveness in enhancing student engagement addresses critical challenges in vocational education, where student motivation and active participation are essential for developing both academic competencies and workplace-relevant skills. The model's emphasis on communication, critical thinking, and collaborative learning aligns with 21st-century skill requirements that vocational school graduates must possess for successful career transitions.

However, several limitations should be acknowledged. The study's focus on a single engagement indicator (expressing ideas) provides a narrow view of the model's comprehensive impact. Future research should examine the AIR model's effects on additional engagement dimensions, including collaborative problem-solving and sustained attention. Additionally, the relatively short intervention period may not capture long-term engagement patterns or skill retention. Longitudinal studies would provide valuable insights into the sustained effectiveness of the AIR model over extended periods.

The findings contribute to the growing body of evidence supporting innovative pedagogical approaches in religious education contexts, demonstrating that effective teaching methods can transcend subject-specific boundaries. The AIR model's success in enhancing student engagement in Islamic Religious Education suggests its potential applicability across diverse religious and cultural educational settings, warranting further investigation in varied institutional contexts.

CONCLUSION

This study provides compelling empirical evidence for the effectiveness of the AIR (Auditory, Intellectual, and Repetition) learning model in enhancing student learning engagement within Islamic Religious Education contexts. The quasi-experimental investigation revealed statistically significant differences between experimental and control groups ($t(60) = 3.456$, $p = 0.011$), with students receiving AIR model instruction demonstrating substantially higher engagement levels in expressing ideas ($M = 23.45$) compared to those receiving conventional direct instruction ($M = 20.87$). The large

effect size (Cohen's d = 0.89) underscores the practical significance of these findings, indicating that the AIR model produces meaningful improvements in student engagement that extend beyond statistical significance.

The research contributes significantly to educational theory and practice by addressing critical gaps in learning engagement literature, particularly within religious education contexts. By demonstrating the AIR model's effectiveness through rigorous experimental design, this study extends the theoretical understanding of how multifaceted pedagogical approaches can systematically enhance student participation and expression. The findings validate the three-component engagement framework, showing how auditory, intellectual, and repetition elements synergistically foster behavioral, cognitive, and emotional engagement dimensions. This contribution is particularly valuable given the limited empirical research on innovative teaching methods in Islamic Religious Education settings.

The practical implications for educational practitioners are substantial. The study provides evidence-based support for adopting student-centered pedagogical approaches that prioritize active participation over passive reception of information. For vocational educators, the AIR model offers a structured framework for transforming traditional lecture-based instruction into dynamic, interactive learning experiences that better prepare students for 21st-century workplace demands. The model's systematic approach to overcoming psychological barriers such as fear of expression and lack of self-confidence has direct applicability across diverse educational contexts and subject areas.

Furthermore, these findings have broader implications for educational policy and professional development initiatives. The demonstrated effectiveness of the AIR model suggests that investment in teacher training programs focused on innovative pedagogical methods could yield significant returns in terms of improved student engagement and learning outcomes. Educational institutions should consider integrating such evidence-based teaching strategies into their curriculum delivery frameworks to enhance overall educational quality and student satisfaction.

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