

Enhancing Learning Interest Through Game-Based Peer Tutoring in Islamic Religious Education: Evidence from Elementary School Students

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Article Info

Article history:

Received April 15, 2026

Revised May 24, 2026

Accepted June 30, 2026

Keywords:

Peer tutoring;
Game-based learning;
Learning interest;
Student engagement;
Islamic Religious Education.

ABSTRACT

Students' learning interest plays an important role in determining the effectiveness of the learning process, particularly during the final instructional period when students often experience fatigue and reduced concentration. Preliminary observations at SDN Tenjolaya 03 indicated that students showed low participation, limited enthusiasm, and declining attention during Islamic Religious Education classes. Therefore, this study aimed to examine the effect of game-based peer tutoring on students' learning interest in Islamic Religious Education. This study employed a quantitative approach using a quasi-experimental design with a non-equivalent control group design. The participants consisted of 55 fifth-grade students divided into an experimental group and a control group. The experimental group received instruction through a game-based peer tutoring approach, while the control group received conventional instruction. Data were collected using a learning-interest questionnaire and analyzed using descriptive statistics, paired sample t-tests, and independent sample t-tests. The findings revealed that students in the experimental group demonstrated a significant increase in learning-interest scores after the intervention. The mean score increased from 70.66 in the pre-test to 80.17 in the post-test. Furthermore, the independent sample t-test indicated a statistically significant difference between the experimental and control groups ($p < 0.001$). These findings suggest that the integration of peer tutoring and game-based learning effectively enhances students' learning interest by promoting active participation, collaboration, and enjoyable learning experiences. In conclusion, game-based peer tutoring represents an effective instructional strategy for increasing students' learning interest in Islamic Religious Education at the elementary school level. The findings provide practical implications for teachers seeking innovative approaches to improve student engagement and participation in classroom learning.

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1 INTRODUCTION

The quality of education is closely related to students' engagement in the learning process. In the twenty-first century, educational systems worldwide are encouraged to implement learner-centered approaches that foster active participation, collaboration, critical thinking, and meaningful learning experiences. The success of educational reform is not solely determined by curriculum development but also by the extent to which students demonstrate interest and willingness to engage in classroom activities. Learning interest plays a crucial role in shaping students' motivation, persistence, and academic achievement across various educational contexts.[1]

In Indonesia, efforts to improve educational quality are reflected in the implementation of the Merdeka Curriculum, which emphasizes student-centered learning, active participation, and differentiated instruction. Furthermore, the National Education System Law No. 20 of 2003 highlights that education should develop learners' potential through meaningful and engaging learning experiences. These policy directions indicate that teachers are required to employ innovative instructional strategies capable of maintaining students' engagement throughout the learning process, including during less conducive instructional periods such as the final hours of the school day[2].

From a theoretical perspective, learning interest refers to a psychological tendency characterized by feelings of enjoyment, attention, curiosity, and active involvement in learning activities [3]. Students who possess high learning interest tend to

demonstrate stronger concentration, greater participation, and better academic performance. Conversely, low learning interest often leads to passive classroom behavior, reduced engagement, and lower learning outcomes [4], [5]. Therefore, enhancing learning interest remains one of the major concerns in contemporary educational research.

Recent studies have consistently reported that maintaining students' learning interest presents a significant challenge, particularly during the final instructional hours. Physical fatigue, cognitive overload, and decreased attention span frequently contribute to declining student engagement. Several studies revealed that students exhibit lower concentration and reduced classroom participation during afternoon sessions compared with morning classes [6]–[8]. This phenomenon becomes more pronounced when teachers predominantly rely on conventional teacher-centered instructional methods.

Within the context of Islamic Religious Education (PAI), the challenge appears even more substantial. Previous studies reported that many students perceive PAI as a subject dominated by memorization activities and theoretical content, resulting in reduced enthusiasm toward learning activities [9], [10]. Other findings indicated that monotonous instructional practices and limited utilization of interactive learning media contribute to students' declining interest in PAI classes [11]. Consequently, there is a growing need for instructional innovations capable of increasing students' engagement and participation in PAI learning environments.

One instructional approach that has received considerable attention is peer tutoring. Grounded in Vygotsky's social constructivist theory, peer tutoring facilitates knowledge construction through social interaction among learners. Students with higher mastery levels assist peers experiencing learning difficulties, thereby creating collaborative and supportive learning environments [12], [13]. Empirical evidence has demonstrated that peer tutoring can improve academic achievement, social interaction, self-confidence, and student participation across various educational levels [14], [15].

In parallel, game-based learning has emerged as an effective pedagogical strategy for increasing students' motivation and engagement. The integration of game elements into instructional activities creates enjoyable learning experiences, promotes active participation, and stimulates collaborative problem-solving skills [16]. Several studies have shown that game-based learning positively influences students' motivation, engagement, and learning outcomes [17], [18].

Although previous studies have extensively examined peer tutoring and game-based learning separately, several limitations remain evident. First, most studies focus primarily on cognitive achievement rather than students' learning interest. Second, limited attention has been given to the implementation of peer tutoring integrated with game-based learning. Third, studies investigating the effectiveness of such integration during the final instructional period, when students generally experience reduced concentration and motivation, remain scarce. Therefore, empirical evidence regarding the effectiveness of game-based peer tutoring in improving learning interest during the final lesson period is still limited.

Preliminary observations conducted at SDN Tenjolaya 03, Bandung Regency, revealed that students frequently demonstrated signs of decreased learning interest during the final lesson period, including lack of attention, fatigue, drowsiness, minimal classroom participation, and a tendency to focus on returning home rather than engaging in learning activities. These conditions were particularly evident during Islamic Religious Education classes and were further exacerbated by the use of conventional instructional approaches that provided limited opportunities for active student engagement.

Accordingly, the novelty of this study lies in the integration of peer tutoring and game-based learning within Islamic Religious Education instruction specifically implemented during the final lesson period. Unlike previous studies that mainly investigated academic achievement outcomes, this study focuses on students' learning interest as the primary outcome variable. Furthermore, this study contributes empirical evidence from the elementary school context, which remains underrepresented in existing literature.

Therefore, this study aims to examine the effect of game-based peer tutoring on students' learning interest in Islamic Religious Education classes at SDN Tenjolaya 03. The findings are expected to contribute both theoretically and practically. Theoretically, the study enriches the literature concerning collaborative and game-based instructional strategies in elementary education. Practically, it provides teachers with an innovative instructional alternative to enhance students' learning interest, particularly during instructional periods characterized by declining attention and motivation.

Existing studies have confirmed the effectiveness of peer tutoring in improving academic achievement and classroom engagement, while game-based learning has been widely reported to enhance motivation and learning interest. However, three important gaps remain. First, previous studies predominantly focused on cognitive outcomes rather than learning interest as the primary variable. Second, research integrating peer tutoring and game-based learning into a single instructional model remains limited. Third, little empirical evidence is available regarding the effectiveness of this integrated approach in Islamic Religious Education classes, particularly during the final instructional period when students commonly experience decreased concentration and engagement. Therefore, further investigation is necessary to address these gaps and enrich the literature on innovative instructional strategies in elementary Islamic education.

The novelty of this study lies in the integration of peer tutoring and game-based learning within Islamic Religious Education instruction at the elementary school level during the final lesson period. Unlike previous studies that mainly examined learning achievement or motivation separately, this study focuses specifically on students' learning interest as the primary outcome

variable and investigates the effectiveness of the integrated instructional model in a context that has received limited scholarly attention.

2 RESEARCH METHOD

Research Design

This study employed a quantitative approach using a quasi-experimental design with a non-equivalent control group design. This design is frequently utilized in educational settings where random assignment of participants is impractical due to pre-existing classroom structures, while still allowing researchers to examine the causal effects of instructional interventions on educational outcomes [19], [20]. The study involved two groups: an experimental group that received game-based peer tutoring instruction and a control group that received conventional instruction. Students' learning interest was measured before and after the intervention through pre-test and post-test assessments.[21], [22]

The research design is presented in Table 1.

Table 1. Research Design of the Study			
Group	Pre-test	Treatment	Post-test
Experimental	O ₁	X	O ₂
Control	O ₃	–	O ₄

where O₁ and O₃ represent pre-test scores, X denotes the game-based peer tutoring intervention, and O₂ and O₄ represent post-test scores.

Research Setting and Participants

This study was conducted at SDN Tenjolaya 03, Bandung Regency, West Java, Indonesia, during the 2024/2025 academic year. Participants were selected using purposive sampling because the study required classes with similar academic characteristics and learning conditions that were relevant to the research objectives [23]–[25]. The participants consisted of fifth-grade students divided into two intact classrooms. Class VB was assigned as the experimental group, while Class VA served as the control group. The selection was based on similarities in age, curriculum exposure, academic background, and classroom learning environment.

Intervention Procedure

The experimental group received instruction through a game-based peer tutoring approach. Peer tutoring is a collaborative learning strategy in which students with higher levels of understanding assist their peers in mastering instructional content. Previous studies have demonstrated that peer tutoring can enhance student engagement, collaborative learning experiences, and academic achievement.

The intervention was implemented through the following stages:

1. Selection of peer tutors based on academic achievement and mastery of learning materials.
2. Formation of heterogeneous learning groups consisting of tutors and tutees.
3. Teacher explanation of the instructional content.
4. Implementation of the *sambung ayat* (Qur'anic verse continuation) game facilitated by peer tutors.
5. Group discussion and peer-assisted learning activities.
6. Reflection and reinforcement conducted by the teacher.

The integration of game elements was intended to create an engaging learning environment that could maintain students' attention and participation during the final instructional period. Game-based learning has been recognized as an effective pedagogical approach for increasing students' motivation, engagement, and active participation in classroom activities [17], [18]. Meanwhile, students in the control group received conventional instruction consisting of teacher explanations, question-and-answer activities, and individual exercises without peer tutoring or game-based activities.

Instrumentation

Students' learning interest was measured using a structured questionnaire developed based on four dimensions of learning interest: (1) attention toward learning activities, (2) enjoyment during learning, (3) curiosity toward learning materials, and (4) active participation in classroom activities. Responses were measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Likert-scale instruments are widely used for measuring attitudes, perceptions, and psychological constructs in educational research[26]

The operational definitions of the study variables are presented in Table 2.

Table 2. Operational Definition of Variables

Variable	Indicators	Measurement Scale
Game-Based Peer Tutoring (Independent Variable)	Peer interaction, collaborative learning, tutor guidance, educational game activities (<i>sambung ayat</i>)	Treatment
Learning Interest (Dependent Variable)	Attention, enjoyment, curiosity, active participation	Five-point Likert Scale

Prior to data collection, the instrument underwent validity and reliability testing. Item validity was assessed using Pearson Product-Moment correlation analysis. Instrument reliability was evaluated using Cronbach's Alpha coefficient. According to Taber, Cronbach's Alpha values greater than 0.70 indicate acceptable internal consistency for educational research instruments.

Data Analysis

Data were analyzed using IBM SPSS Statistics software. Descriptive statistics were first employed to summarize students' learning interest scores before and after the intervention. Assumption testing included the Shapiro–Wilk test to assess data

normality and Levene's test to evaluate homogeneity of variance [27]. To determine whether significant changes occurred within each group, a Paired Sample t-Test was conducted. Furthermore, an Independent Sample t-Test was performed to compare post-test learning interest scores between the experimental and control groups. All statistical analyses were conducted at a significance level of $\alpha = 0.05$. The null hypothesis was rejected when the p-value was less than 0.05, indicating a statistically significant difference in students' learning interest between groups.

3 RESULTS AND DISCUSSION

3.1. Instrument Validity and Reliability

Prior to the main analysis, the validity of the learning interest questionnaire was evaluated using Pearson Product-Moment correlation analysis. The results showed that 19 out of 27 questionnaire items met the validity criterion ($r > 0.361$), indicating a significant correlation between the item scores and the total score. Meanwhile, eight items did not meet the required criterion and were therefore excluded from subsequent analyses. These findings indicate that the majority of the questionnaire items were capable of measuring the intended construct of learning interest.

Table 3. Instrument Validity Results

Measurement	Result	Interpretation
Total items tested	27	Evaluated
Valid items	19	Retained for analysis
Invalid items	8	Excluded from analysis

The validity results suggest that the instrument possessed adequate measurement properties for assessing students' learning interest. Therefore, only the valid items were retained and used in subsequent statistical analyses to ensure the accuracy and consistency of the measurement.

3.2. Descriptive Statistics of Students' Learning Interest

Descriptive statistics were calculated to provide an overview of students' learning interest scores before and after the intervention. The results are presented in Table 4.

Table 4. Descriptive Statistics of Learning Interest Scores

Group	N	Pre-test Mean	Post-test Mean
Control Group	26	72.08	70.77
Experimental Group	29	70.59	80.14

As shown in Table 4, the experimental group demonstrated a substantial increase in learning interest following the implementation of the game-based peer tutoring approach. The mean score increased from 70.59 in the pre-test to 80.14 in the post-test, indicating an improvement of approximately 9.55 points. In contrast, the control group exhibited a slight decrease, with the mean score declining from 72.08 in the pre-test to 70.77 in the post-test.

These preliminary findings suggest that the game-based peer tutoring intervention may have contributed positively to students' learning interest. However, further statistical testing was required to determine whether the observed differences were statistically significant.

3.3 Effect of Game-Based Peer Tutoring on Students' Learning Interest

To examine the effectiveness of the game-based peer tutoring approach in improving students' learning interest, a paired sample t-test was conducted by comparing the pre-test and post-test scores of the experimental group.

Table 5. Paired Sample t-Test Results for the Experimental Group

Variable	Pre-test Mean	Post-test Mean	Mean Difference	t	df	Sig. (2-tailed)
Learning Interest	70.66	80.17	-9.517	-5.629	28	0.000

As presented in Table 5, the mean score of students' learning interest increased from 70.66 in the pre-test to 80.17 in the post-test. The paired sample t-test revealed a statistically significant difference between the two measurements ($t = -5.629$, $p < 0.001$), indicating that students demonstrated higher levels of learning interest after participating in the game-based peer tutoring intervention. The mean difference of 9.517 points suggests that the intervention contributed substantially to enhancing students' engagement and enthusiasm toward Islamic Religious Education learning. These findings indicate that integrating peer tutoring with game-based activities can create a more interactive and enjoyable learning environment, thereby fostering greater student interest in classroom learning.

3.4 Comparison of Learning Interest Between the Experimental and Control Groups

To determine whether there was a significant difference in students' learning interest between the experimental group and the control group after the intervention, an independent sample t-test was conducted. This analysis was performed to compare the post-test scores of students who participated in game-based peer tutoring with those who received conventional instruction.

Table 6. Independent Sample t-Test Results

Group	Mean Score
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Experimental Group	80.17
Control Group	70.08
Statistical Test	Value
Sig. (2-tailed)	0.000

The results of the independent sample t-test revealed a significance value of 0.000, which was lower than the predetermined significance level of 0.05. Therefore, the null hypothesis was rejected, indicating a statistically significant difference in learning interest between students in the experimental group and those in the control group. Students who learned through the game-based peer tutoring method achieved a higher mean learning-interest score (80.17) compared with students who experienced conventional learning (70.08). Furthermore, while the experimental group demonstrated a substantial increase in learning-interest scores from pre-test to post-test, the control group showed a slight decline during the same period.

These findings suggest that the game-based peer tutoring approach was more effective than conventional instruction in fostering students' learning interest during Islamic Religious Education classes. The collaborative interaction among peers and the integration of educational game activities created a more engaging learning environment, which encouraged active participation and sustained students' attention throughout the learning process

3.5 Discussion

The findings of this study indicate that the implementation of game-based peer tutoring significantly improved students' learning interest in Islamic Religious Education during the final instructional period. The experimental group demonstrated a substantial increase in learning-interest scores after the intervention, whereas the control group showed no meaningful improvement. Furthermore, the independent sample t-test confirmed a significant difference between the experimental and control groups, indicating that the observed improvement was associated with the instructional intervention. These findings suggest that the integration of peer tutoring and game-based learning creates a more engaging learning environment capable of sustaining students' attention, participation, and enthusiasm throughout the learning process.

The improvement in students' learning interest can be explained by the collaborative characteristics of peer tutoring. Through peer-assisted learning activities, students actively exchanged ideas, explained concepts, asked questions, and provided support to their classmates. Such interactions encouraged learners to become active participants rather than passive recipients of information. This finding is consistent with previous studies showing that peer-supported learning environments positively influence students' engagement, motivation, and academic performance by promoting meaningful social interaction and collaborative knowledge construction [28]–[30]. In addition, peer tutoring has been found to strengthen students' confidence, communication skills, and willingness to participate in classroom activities, all of which contribute to the development of learning interest.

The effectiveness of peer tutoring observed in this study also supports the social constructivist perspective, which emphasizes that learning occurs through interaction with others and the co-construction of knowledge. Students who learn collaboratively tend to exhibit greater attention and persistence because they receive both academic and emotional support from their peers. Xu et al. reported that peer attention significantly enhances student learning engagement and participation, while Pi et al. demonstrated that learning alongside familiar peers improves students' attention, behavioral engagement, and academic performance [31]. Therefore, the positive outcomes identified in the present study suggest that peer tutoring serves not only as a cognitive support strategy but also as a mechanism for increasing students' affective engagement with learning.

Another important factor contributing to the effectiveness of the intervention is the incorporation of game-based learning activities. The *sambung ayat* game transformed the learning process into an enjoyable and interactive experience by integrating elements of challenge, competition, collaboration, and immediate feedback. Educational games have been widely recognized as effective tools for increasing students' motivation and engagement because they create meaningful learning experiences that stimulate curiosity and active participation [3]. Students are generally more willing to participate in learning activities when instructional tasks are perceived as enjoyable rather than repetitive, thereby increasing their overall interest in learning.

The present findings are consistent with contemporary research demonstrating the effectiveness of game-based learning in educational settings. Ding and Yu found that game-based learning significantly improves students' engagement and learning outcomes by encouraging active participation and deeper involvement in learning tasks [32]. Similarly, Alotaibi's systematic review concluded that educational games positively influence students' motivation, engagement, and attitudes toward learning across different educational levels [1]. These findings suggest that the positive impact observed in the present study may be attributed to the ability of game-based learning to transform traditional classroom instruction into a more student-centered and motivating learning experience.

The significant difference between the experimental and control groups further highlights the limitations of conventional instructional approaches in maintaining students' learning interest during the final instructional period. In the control group, learning activities were primarily centered on teacher explanations and individual assignments, resulting in fewer opportunities for active participation and peer interaction. Previous studies have indicated that learning interest develops when students experience meaningful engagement, curiosity, and enjoyment during instructional activities [33]. Consequently, conventional

approaches that rely heavily on passive learning may be less effective in sustaining students' attention and motivation, particularly when students experience cognitive fatigue during afternoon lessons.

In contrast, the game-based peer tutoring approach provided students with opportunities to collaborate, communicate, and participate actively throughout the lesson. Such experiences are consistent with the principles of peer learning, which emphasize mutual support, shared responsibility, and active knowledge construction [34]. Furthermore, research on visible learning has shown that instructional strategies involving active participation and collaborative interaction tend to produce stronger educational outcomes than teacher-centered approaches. Therefore, the superiority of the intervention observed in this study can be attributed to the combination of social interaction and enjoyable learning experiences embedded within the game-based peer tutoring model.

From a practical perspective, the findings suggest that game-based peer tutoring can serve as an effective instructional strategy for addressing declining student engagement during final-period classes. The approach is relatively simple to implement, requires minimal technological resources, and simultaneously promotes cognitive, social, and affective development. Moreover, increasing students' learning interest is particularly important because learning interest has been consistently associated with higher engagement, improved learning outcomes, and better educational well-being [29]. Consequently, integrating peer tutoring and educational games may represent a promising strategy for improving the quality of Islamic Religious Education learning in primary schools.

Overall, this study contributes to the growing body of literature emphasizing the importance of active, collaborative, and enjoyable learning environments in fostering students' learning interest. While previous studies have examined peer tutoring and game-based learning separately, the present study demonstrates that the integration of both approaches can effectively enhance students' learning interest in Islamic Religious Education. More importantly, the findings provide empirical evidence that game-based peer tutoring can be used to address the specific challenge of declining student engagement during final-period learning sessions in Indonesian primary schools.

4 CONCLUSION

This study investigated the effect of game-based peer tutoring on students' learning interest in Islamic Religious Education during the final instructional period at the elementary school level. The findings demonstrated that the implementation of game-based peer tutoring significantly improved students' learning interest. Students in the experimental group showed a substantial increase in learning-interest scores after the intervention, whereas students in the control group who received conventional instruction did not experience a significant improvement. Furthermore, the comparison between groups revealed that students exposed to game-based peer tutoring achieved significantly higher levels of learning interest than those taught through traditional teacher-centered approaches.

These findings suggest that the integration of peer tutoring and game-based learning provides an effective instructional strategy for fostering students' engagement, participation, and enthusiasm in learning. By combining collaborative peer interaction with enjoyable learning activities, the approach successfully addressed the challenge of declining student interest during the final instructional period. Therefore, game-based peer tutoring may serve as a practical and innovative alternative for enhancing learning interest in Islamic Religious Education and other elementary school subjects. Future studies are recommended to examine the long-term effects of this instructional approach across different educational levels, subject areas, and larger samples to strengthen the generalizability of the findings.

5 ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to the principal, teachers, and students of SDN Tenjolaya 03 for their cooperation and participation in this study. The authors also thank all individuals who provided valuable assistance during the data collection process and contributed to the successful completion of this research.

6 DECLARATIONS

AI USAGE STATEMENT

During the preparation of this work, the authors used ChatGPT (OpenAI) to assist in improving the language, grammar, clarity, and academic writing quality of the manuscript. The tool was also used to support the organization of the manuscript structure and the refinement of academic expressions. After using this tool, the authors carefully reviewed, revised, and edited all generated content as necessary and take full responsibility for the accuracy, integrity, and content of the publication.

AUTHOR CONTRIBUTION

Author 1: Conceptualization, Investigation, Data Collection, Data Curation, Formal Analysis, Writing – Original Draft Preparation.

Author 2: Methodology, Validation, Supervision, Writing – Review & Editing.

Author 3: Supervision, Project Administration, Validation, Writing – Review & Editing.

Author 4: Methodology Consultation, International Academic Review, Critical Revision of the Manuscript, Validation, Writing – Review & Editing.

All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

FUNDING STATEMENT

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

COMPETING INTEREST

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

ETHICAL APPROVAL

This study was conducted in accordance with the ethical principles of educational research. Permission to conduct the research was obtained from SDN Tenjolaya 03, Bandung Regency, Indonesia. Participation in the study was voluntary, and all data were collected, processed, and reported solely for academic purposes while maintaining the confidentiality and anonymity of the participants.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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