



Effectiveness of Gamified Qur'an-Hadith Learning on Cognitive Achievement and Student Engagement: A Sequential Explanatory Mixed-Methods Study in an Islamic Elementary School

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ARTICLE INFO	ABSTRACT
Article history: Submitted: August 08, 2026 Final Revised: Sept. 21, 2026 Accepted: September 24, 2026 Published: September 28, 2026 Keywords: Gamified Learning; Qur'an-Hadith Instruction; Islamic Elementary School; Mixed-Methods Evaluation; Student Motivation.	Purpose: This study evaluates the effectiveness and impact of implementing gamified learning on students' academic achievement and learning engagement in Qur'an-Hadith education to address low student motivation stemming from traditional instruction. Methods: Utilizing a mixed-methods sequential explanatory design across a six-session intervention, this study examined 60 fifth-grade Islamic elementary school students assigned to experimental (n = 30) and control (n = 30) groups, complemented by qualitative interviews with 2 teachers and 6 students. Quantitative data were analyzed using independent sample t-tests and ANCOVA to adjust for baseline baseline ability, while qualitative transcriptions underwent thematic analysis. Findings: Controlling for pre-test scores, ANCOVA demonstrated that the experimental group achieved significantly higher adjusted post-test performance (EMM = 84.50, SE = 1.12) compared to the control group (EMM = 72.10, SE = 1.12), $F(1, 57) = 48.92, p < .001, \eta_p^2 = .462$. Qualitative findings revealed that gamification mechanics specifically structured points, leaderboards, and interactive challenges enhanced student engagement, self-reported retention of scriptural text, and peer collaboration. Research Implications: Gamified learning offers a practical, high-impact pedagogical framework for modernizing religious education in Islamic elementary schools, demonstrating clear utility for enhancing short-term cognitive performance and classroom participation. Originality: This study provides empirical evidence for integrating tailored game mechanics directly into primary-level Qur'an-Hadith curricula, addressing a critical gap in educational technology research within traditional religious instruction.



Doi: <https://doi.org/10.61255/jupiter.v4i4.1812>

INTRODUCTION

The digital transformation of education has increasingly reshaped how teaching and learning are designed, particularly at the primary school level. Rather than treating digital technology merely as an instructional supplement, contemporary pedagogical approaches increasingly emphasize interactive learning environments that provide continuous feedback, opportunities for active participation, and meaningful progression. Gamification has emerged within this transformation as an instructional strategy that incorporates selected game-design elements into non-game educational contexts to strengthen students' participation and learning experiences. Recent systematic reviews and meta-analyses provide growing empirical support for its educational potential. A systematic review of K–12 gamification research, for example, synthesized 54 empirical studies and highlighted the importance of pedagogically structured gamified environments rather than the simple addition of game elements to instruction (Dehghanzadeh et al., 2024). Similarly, a meta-analysis involving 41 studies and more than 5,000 participants reported a significant overall effect of gamification on educational outcomes, although the magnitude of its effects varied according to instructional and contextual conditions (Li et al., 2023).

More recent evidence further indicates that the potential of gamification extends beyond students' enjoyment or motivation. A 2024 systematic review of gamification and school engagement identified 90 eligible interventions across primary and secondary education and emphasized that engagement should be understood as a multidimensional

construct involving behavioral, emotional, and cognitive dimensions (Ramírez-Ruiz et al., 2024). Another systematic review published in 2024 found that gamification can positively influence motivation and academic performance, while also emphasizing that its effectiveness depends on how game mechanics are pedagogically integrated into learning activities. These findings suggest that the educational value of gamification does not arise from game elements per se, but from their alignment with learning objectives, instructional sequencing, feedback processes, and students' psychological needs.

This issue is particularly relevant to Qur'an-Hadith instruction in Islamic elementary schools (*Madrasah Ibtidaiyah* or MI). Qur'an-Hadith learning requires students to engage simultaneously with several learning processes, including memorization, textual comprehension, interpretation, and the application of religious values in everyday behavior. These processes can become pedagogically challenging when instruction relies predominantly on teacher explanation and repetitive practice without sufficient variation in learning activities. For elementary school students, repetitive learning without meaningful feedback or opportunities for active participation may reduce attention and persistence, particularly when learning tasks are perceived as monotonous. Therefore, the challenge is not simply to digitize Qur'an-Hadith instruction, but to develop a learning environment in which digital technology supports the distinctive cognitive and pedagogical demands of religious learning.

Recent scholarship has begun to explore this possibility. A 2024 systematic review of gamification in Islamic education reported that game elements such as points, rewards, and challenges can support students' motivation and engagement in Qur'an memorization activities. Research published in 2025 also reported positive effects of a gamified digital platform on students' motivation and learning outcomes in Islamic education, including Qur'anic studies and Islamic history. In addition, recent scholarship has specifically discussed gamification as a possible approach to Qur'an learning while emphasizing the need to preserve the substance and educational purpose of Qur'anic instruction. These studies demonstrate that the integration of gamification into Islamic education is no longer a purely conceptual possibility. Nevertheless, important empirical and pedagogical limitations remain.

First, much of the emerging literature on gamification in Islamic education has focused on motivation, memorization, or digital application development, while comparatively fewer studies have simultaneously examined cognitive achievement and student engagement through a controlled empirical design at the *Madrasah Ibtidaiyah* level. Second, evidence from broader educational research indicates that increased engagement does not automatically translate into improved academic performance; consequently, the effectiveness of gamification needs to be examined in relation to specific learning outcomes and instructional contexts rather than assumed from students' positive perceptions alone. Third, existing studies provide limited explanation of how game mechanics can be adapted to the distinctive pedagogical and ethical characteristics of Qur'an-Hadith learning. Thus, the relevant research gap is not the absence of gamification research in Islamic education, but the limited empirical evidence concerning how a pedagogically aligned gamified model can simultaneously influence cognitive achievement and engagement in Qur'an-Hadith learning at the elementary Islamic school level.

To address this gap, the present study conceptualizes gamified Qur'an-Hadith learning through Self-Determination Theory (SDT). SDT proposes that sustained motivation is supported when learning environments facilitate the psychological needs for autonomy, competence, and relatedness. Within a gamified learning environment, these needs can be supported through structured choices, progressive challenges, immediate feedback, visible indicators of mastery, and collaborative activities. Importantly, however, game mechanics should not be introduced independently of the instructional logic of Qur'an-Hadith learning. This study therefore introduces the concept of pedagogical *munasabah*, defined as the deliberate alignment between gamification mechanics and the pedagogical, ethical, and instructional characteristics of Qur'an-Hadith instruction. Under this principle, game elements are not intended merely to entertain students but to function as pedagogical scaffolds for memorization, comprehension, practice, feedback, and moral application.

The principle of pedagogical *munasabah* is operationalized through the alignment of specific gamification mechanics with instructional functions. Points and badges are used to provide visible recognition of progress and mastery; levels represent progressive movement from recall and comprehension toward more complex learning tasks; quests organize learning activities into meaningful sequences; immediate feedback supports the correction of errors; and collaborative challenges facilitate peer interaction and relatedness. Such alignment is consistent with recent evidence indicating that gamification is more effective when its mechanics are integrated with clear pedagogical objectives rather than implemented as isolated motivational features.

The intervention in this study consists of six instructional sessions designed as a short-cycle gamified learning intervention. The six-session structure is not intended to establish long-term retention or sustained behavioral change; rather, it provides repeated exposure to the core gamification mechanics across a coherent instructional sequence. Across the sessions, students encounter progressive challenges, immediate feedback, achievement markers, and

collaborative activities while learning curriculum-aligned Qur'an-Hadith content. This design allows the study to examine whether repeated exposure to these mechanisms is associated with measurable differences in cognitive achievement and classroom engagement within the intervention period.

Accordingly, this study addresses two research questions: (1) To what extent does gamified learning affect students' cognitive achievement in Qur'an-Hadith instruction compared with conventional instruction? and (2) How do students and teachers perceive and experience the role of gamification in supporting engagement during Qur'an-Hadith learning? A sequential explanatory mixed-methods design is employed to answer these questions by first examining quantitative differences in learning achievement and subsequently exploring qualitative experiences that may explain the observed outcomes.

The contribution of this study is threefold. Empirically, it provides controlled evidence concerning the effects of gamification on cognitive achievement and engagement in Qur'an-Hadith instruction at the Madrasah Ibtidaiyah level. Theoretically, it extends the application of Self-Determination Theory to a religious-learning context in which motivation must be considered alongside the distinctive instructional and ethical characteristics of Qur'anic and Hadith content. Pedagogically, it proposes pedagogical *munasabah* as an alignment principle for designing gamified religious learning, demonstrating how contemporary game mechanics can be integrated with, rather than substituted for, the established objectives of memorization, comprehension, practice, and religious-value application.

Tabel 1. Synthesis of Literature and Identified Gap

Research Stream	Focus & Scope	Methodological/Theoretical Limitations	The Present Contribution	Study's
Traditional Pedagogy	Drills, <i>tikrar</i> , and rote memorization (Hasanah & Suryana, 2022).	High cognitive load, low intrinsic motivation, minimal interactivity.	Introduces structured game mechanics to lower cognitive fatigue and boost intrinsic drive.	
App Development	Basic Quranic quiz apps and media tools (Rahman & Subhi, 2021).	Lacks clear theoretical frameworks (e.g., SDT); relies heavily on usability testing.	Grounds design in SDT (autonomy, competence, relatedness) and pedagogical <i>munasabah</i> .	
Qualitative Digital Studies	Teacher perceptions and descriptive case studies (Sufiarina et al., 2022).	Limited empirical evidence regarding cognitive impact or controlled comparisons.	Employs a Sequential Explanatory Mixed-Methods design (ANCOVA + thematic analysis).	

As illustrated above, relatively few empirical studies have systematically evaluated how gamified Qur'an-Hadith instruction impacts both cognitive outcomes and psychological engagement using a robust mixed-methods framework. Relying solely on quantitative metrics risks missing the nuanced perceptions of teachers and young learners regarding sacred content, while purely qualitative studies lack statistical rigor. A sequential explanatory mixed-methods design directly addresses this limitation: the quantitative phase measures the magnitude of achievement shifts, while the subsequent qualitative phase illuminates how and why specific gamification elements influence motivation and classroom dynamics. Accordingly, this study aims to evaluate the effectiveness and impact of gamified Qur'an-Hadith instruction in an Islamic elementary school context. Specifically, it addresses two main research questions:

1. Does gamified Qur'an-Hadith learning significantly improve students' cognitive achievement compared to conventional methods when controlling for baseline ability?
2. How do students and teachers perceive the role of gamification mechanics in fulfilling basic psychological needs (autonomy, competence, and relatedness) during scripture learning?

METHOD

This study employed a mixed-methods approach using a sequential explanatory design (QUAN → qual) to examine the effectiveness and implementation of gamified learning in Qur'an-Hadith instruction. The design consisted of two sequential phases. The first phase involved a quantitative quasi-experimental study to determine whether gamified learning produced a statistically significant improvement in students' Qur'an-Hadith learning outcomes. The second phase involved qualitative inquiry to explain and contextualize the quantitative findings, particularly the patterns of students' engagement, motivation, participation, and learning experiences during the gamified intervention (Creswell & Creswell, 2018), (Ivankova et al., 2016).

The quantitative phase employed a non-equivalent control group pre-test–post-test design because the participants were drawn from pre-existing fifth-grade classes and were not randomly assigned individually to the experimental and control conditions. Two intact classes with comparable academic characteristics were selected based

on school records and baseline pre-test results. One class was designated as the experimental group and received gamified Qur'an-Hadith instruction, whereas the other class served as the control group and received conventional instruction. Thus, the study did not involve individual randomization, and the term "assigned" refers to the designation of intact classes rather than random allocation of individual students. To address potential class-level confounding variables arising from the non-randomized allocation of intact classes (where class/teacher characteristics may confound treatment effects when analyzing data at the individual level), the instructional conditions were strictly controlled. Both classes were taught by teachers who possessed equivalent educational qualifications (Bachelor's degree in Islamic Education) and teaching experience (5–7 years). Furthermore, instructional duration, core curricular content, learning objectives, and assessment schedules were standardized across both groups to minimize teacher- and class-level bias.

Participants and Sampling

The quantitative participants consisted of 60 fifth-grade students enrolled in an Islamic elementary school in Central Java, Indonesia. Thirty students participated in the experimental group (Class V-A) and 30 students participated in the control group (Class V-B). The selection of the two classes employed purposive sampling based on predetermined criteria, including similar grade level, comparable instructional conditions, availability of the same Qur'an-Hadith curriculum, and baseline comparability of students' learning achievement. Baseline equivalence between the two groups was examined using the pre-test scores before the intervention. Descriptive statistics, including the mean and standard deviation of the pre-test scores, were calculated for each group, followed by an independent-samples statistical comparison to determine whether a statistically significant baseline difference existed. The baseline characteristics and pre-test results are reported in the Results section.

For the qualitative phase, two Qur'an-Hadith teachers and six students from the experimental group were selected using criterion-based purposive sampling. The six students were selected after the quantitative results had been examined to represent different patterns of quantitative outcomes, such as relatively high, moderate, and lower improvement in learning achievement and/or engagement. This procedure was intended to ensure that the qualitative phase could explain not only successful learning experiences but also variations in students' responses to the gamified intervention.

Gamified Learning Intervention

The intervention was implemented over six instructional sessions, with each session lasting approximately 70 minutes (2 × 35 minutes). The experimental group received Qur'an-Hadith instruction using a gamified learning approach supported by Kahoot!. The learning content, learning objectives, and assessment indicators were aligned with the fifth-grade Qur'an-Hadith curriculum.

The gamification strategy incorporated several game elements, including points, badges/rewards, team challenges, missions, and a leaderboard, as appropriate to the learning activities. Each session followed a consistent instructional sequence consisting of: (1) introduction of the learning objectives and activation of prior knowledge; (2) presentation of Qur'an-Hadith content; (3) individual or collaborative gamified activities; (4) feedback and reinforcement; and (5) reflection and formative assessment. The six sessions focused on the following instructional sequence: Session 1 introduced the learning objectives, rules of the gamified activities, and baseline learning activities; Sessions 2–5 implemented the core Qur'an-Hadith learning materials through progressively structured individual and team-based challenges; and Session 6 consolidated the learning content through review activities, a final gamified challenge, and learning reflection.

The control group received the same Qur'an-Hadith learning objectives and curriculum content but was taught using the school's conventional instructional procedures without the systematic use of gamification elements. These procedures included teacher explanation, question-and-answer activities, textbook-based exercises, and conventional assignments. The instructional duration and learning content were kept comparable between the two groups to minimize differences attributable to exposure time rather than the intervention itself. To examine treatment fidelity, classroom observations were conducted throughout the intervention using a structured observation rubric. The rubric assessed implementation of the planned instructional stages, use of the intended gamification elements, student participation, teacher adherence to the intervention protocol, and deviations from the planned procedures. Observation data were used to document whether the intervention was implemented consistently across the six sessions.

Instruments and Data Collection

Three principal instruments were used: (1) Qur'an-Hadith achievement tests, (2) classroom observation rubrics, and (3) semi-structured interview protocols.

1. Qur'an-Hadith achievement tests.

The quantitative achievement instrument consisted of 30 multiple-choice items developed according to the learning indicators contained in the fifth-grade Qur'an-Hadith curriculum. The instrument measured students' achievement in the domains of Qur'an and Hadith reading comprehension, understanding of vocabulary and meanings, identification of the main messages and values contained in QS. Al-Ma'un and QS. Al-Humazah, understanding of Hadith related to social care and compassion, and application of Qur'anic and Hadith values to everyday situations. To ensure measurement consistency and eliminate instrument variance, the exact same 30-item achievement test was administered as both the pre-test (prior to intervention) and post-test (immediately following the intervention), with randomized item and option sequences during administration.

Content validity was evaluated by five panel experts in Islamic education and educational measurement. The Item-Content Validity Index (I-CVI) ranged from 0.80 to 1.00, and the Scale-Level Content Validity Index Universal Agreement (S-CVI/UA) was calculated at 0.90, indicating excellent content validity. The instrument was empirical trial-tested on a non-sample group of 30 fifth-grade students. Item quality analysis revealed acceptable item difficulty indices (P) ranging from 0.33 to 0.77 ($M = 0.55$) and discrimination indices (D) ranging from 0.35 to 0.68, confirming that all 30 items met the psychometric requirements for retaining. Internal consistency reliability for the achievement test yielded a Cronbach's alpha coefficient of $\alpha = 0.82$, demonstrating high reliability.

2. *Classroom observation rubrics*

The classroom observation rubric contained 24 indicators covering student participation, learning motivation, interaction, collaboration, responsiveness to feedback, and implementation fidelity. Each aspect consisted of four indicators rated on a 4-point scale (1 = never observed to 4 = consistently observed). Content validity was confirmed by two educational evaluation experts ($I-CVI = 1.00$). To ensure data reliability, classroom observations were conducted independently by two observers (the researcher and a certified co-observer). Inter-rater reliability was evaluated using Cohen's Kappa (k). Across all six observation sessions, inter-rater agreement achieved a coefficient of $k = 0.84$, indicating strong inter-rater consistency in scoring behavioral engagement.

3. *Semi-Structured Interview Protocols*

Semi-structured interviews were conducted after the quantitative findings had been analyzed. Separate interview protocols were prepared for teachers and students. The teacher interviews addressed perceived changes in students' participation, motivation, learning behavior, classroom interaction, instructional feasibility, and challenges associated with gamified learning. Student interviews focused on their experiences with the gamified activities, perceived enjoyment, motivation, challenges, collaboration, feedback, and perceived contribution of the intervention to their learning. The interview questions were explicitly informed by the quantitative findings. For example, when quantitative results indicated substantial improvement among some students but limited improvement among others, interview questions explored the factors that might explain these differences..

Quantitative Data Analysis

Quantitative data were analyzed using descriptive and inferential statistics using SPSS (Version 26.0). Mean scores, standard deviations, minimum and maximum values, and gain patterns were calculated for the experimental and control groups. Before conducting the primary inferential analysis, statistical assumptions were formally tested and verified:

1. Normality: Assessed via the Shapiro-Wilk test (pre-test experimental: $P = 0.210$; post-test experimental: $p = 0.315$; pre-test control: $p = 0.185$; post-test control: $p = 0.402$), confirming normal distribution ($p > 0.05$).
2. Homogeneity of Variance: Assessed via Levene's Test for Equality of Variances based on post-test scores ($F(1, 58) = 1.24, p = 0.270$), satisfying the assumption ($p > 0.05$).
3. Linearity: Assessed via F -test for linearity between the pre-test covariate and post-test outcome ($F(1, 56) = 28.45, p < 0.001$), confirming a linear relationship.
4. Homogeneity of Regression Slopes: Assessed by testing the interaction between group membership and the pre-test covariate ($F(1, 56) = 0.89, p = 0.350$). The non-significant interaction ($p > 0.05$) confirmed that the regression slopes were homogeneous across groups.

Because the study used pre-test scores as an indicator of baseline achievement and the groups were not randomly assigned, Analysis of Covariance (ANCOVA) was executed as the primary inferential analysis. Post-test achievement served as the dependent variable, instructional condition (gamified versus conventional learning) served as the independent variable, and pre-test achievement served as the covariate. This analysis estimated the adjusted difference in post-test achievement between the two groups while statistically controlling for baseline achievement. An independent-samples t -test was used primarily to examine baseline equivalence between the groups. Partial eta squared (η_p^2) was calculated as the effect size for ANCOVA and interpreted using Cohen's standards (0.01 = small, 0.06 = medium, 0.14 = large) to determine the practical magnitude of the intervention.

Qualitative Data Analysis

Qualitative data from interviews and classroom observations were analyzed using thematic analysis following the six-stage framework by Braun and Clarke (2019): (1) data familiarization; (2) initial code generation; (3) searching for themes; (4) reviewing candidate themes; (5) defining and naming themes; and (6) producing the report. Interview recordings were transcribed verbatim and anonymized. Qualitative analysis involved two coders. Inter-coder discrepancies were resolved through discussion and consensus. To establish qualitative trustworthiness, member checking was systematically conducted upon completion of transcription and preliminary theme formulation. Transcripts and summary interpretations were returned to both participating teachers and the six interviewed students (assisted by teachers for clear comprehension). All participants reviewed and explicitly confirmed that the summaries accurately represented their statements and experiences without requiring substantive modifications. Furthermore, source triangulation was conducted by cross-verifying findings across student interviews, teacher interviews, and field observation logs.

Integration of Quantitative and Qualitative Findings

Integration occurred at the interpretation stage through a connecting and explaining procedure. The quantitative findings were first examined to identify the overall intervention effect and meaningful patterns of student outcomes. These findings then informed the selection of qualitative participants and the development of interview questions. The qualitative findings were subsequently used to explain why and how the quantitative outcomes occurred. The integrated findings were presented through a joint interpretation of statistical results and qualitative themes, allowing the study to explain the mechanisms and classroom conditions that contributed to the observed outcomes.

Ethical Considerations

Following ethical clearance, written permission was secured from the participating school administration. Because participants were minors, formal written informed consent was obtained from parents/legal guardians, and verbal/written assent was obtained from the students. Participants were informed of their right to withdraw at any point without academic penalty. Pseudonyms were assigned to maintain strict confidentiality. All intervention procedures ensured that neither group was deprived of regular curricular learning goals..

RESULTS

In accordance with the sequential explanatory mixed-methods design, the findings are presented in three structured phases: (1) quantitative results evaluating learning outcomes, (2) qualitative findings exploring student and teacher engagement, and (3) an integration of both data streams.

1. Quantitative Results: The Effectiveness of Gamified Learning

a. Assumptions Testing

Preliminary analyses confirmed that baseline assumptions were met. Shapiro-Wilk tests ($n = 30$ per group) indicated normal distribution across pre-test and post-test scores ($p > .05$). Levene's Test for Homogeneity of Variances yielded $F(1, 58) = 1.24, p = .270$, establishing variance homogeneity prior to the intervention.

b. Descriptive Statistics and Score Gain (N-Gain)

Both groups started from comparable baseline conditions (Experimental Pre-test $M = 58.33, SD = 7.12$; Control Pre-test $M = 57.83, SD = 7.45$). Following six instructional sessions, the experimental group achieved a post-test mean of $84.50 (SD = 6.21)$, compared to $72.17 (SD = 7.82)$ in the control group.

Table 2 shows that both groups started from relatively balanced baseline conditions, with the experimental group's pre-test mean at 58.33 and the control group's at 57.83. However, after the treatment consisting of 6 sessions the experimental group experienced a marked increase in post-test scores to 84.50 ($SD = 6.21$). Meanwhile, the control group achieved an average post-test score of 72.17 ($SD = 7.82$). The experimental group's N-Gain value (0.63) falls within the moderate-to-high range, far exceeding that of the control group (0.34).

Table 2. Summary of Descriptive Statistics and Students' N-Gain Scores

Group	Evaluation	N	Mean (M)	Standard Deviation (SD)	Score N-Gain	Effectiveness Category
Experiment	Pre-test	30	58,33	7,12	0,63	Effective / Medium-High

Control	Post-test	30	84,50	6,21	0,34	Medium-Low
	Pre-test	30	57,83	7,45		
	Post-test	30	72,17	7,82		

c. Hypothesis Testing (Independent-Samples t-Test and ANCOVA)

To determine whether the difference in the improvement in cognitive achievement was statistically significant, an independent-samples t-test was conducted on the post-test scores and score gains. A summary of the inferential statistics is presented in Table 3.

Table 3. Results of the Independent-Samples t-Test for the Post-Test of Both Groups

Variabel Evaluasi	t-hitung	Derajat Kebebasan (df)	Nilai p (2-tailed)	Mean Difference	95% Confidence Interval
Post-Test	6,764	58	< 0,001	12,33	[8,68 - 15,98]
N-Gain Score	7,812	58	< 0,001	0,29	[0,21 - 0,36]

The results of the independent samples t-test in Table 3 show a $t(58) = 6.764$ with $p < 0.001$. Since the p-value is less than 0.05, H_o is rejected and H_a is accepted. This confirms a statistically significant difference in mean cognitive learning outcomes between students who participated in gamified Qur'an-Hadith learning and those who learned using conventional methods. To control for potential influence of initial ability (pre-test) on the final results, analysis was continued using Analysis of Covariance (ANCOVA). The ANCOVA results confirmed that the gamification treatment had a very strong main effect on post-test scores ($F(1, 57) = 48.92$, $p < 0.001$, *partial eta squared* $\eta_p^2 = 0.462$). This partial eta-squared value $\eta_p^2 = 0.462$ indicates a large effect size, meaning that 46.2% of the variance in student learning outcomes can be explained by the implementation of gamified learning strategies.

2. Qualitative Findings: Dynamics of Motivation, Engagement, and Perceptions

To explain why and how the gamified learning intervention succeeded in significantly improving students' cognitive achievement, qualitative data were collected through semi-structured interviews (2 teachers, 6 students) and participatory observation. Based on thematic analysis using the Braun & Clarke model, three main themes were identified (Braun & Clarke, 2019):

a. Theme 1: Shift in Learning Orientation (Enhancing Intrinsic Motivation)

Classroom observations revealed a drastic change in learning dynamics within the experimental group. Whereas under conventional conditions students tended to be passive and quickly bored when asked to memorize or understand the rules of tajwid, the inclusion of gamification elements (such as a point system and daily quests) sparked high enthusiasm. Students no longer viewed memorization tasks as a rigid burden, but rather as enjoyable challenges.

This was reinforced by a statement from one student (S-02):

"Before, when the Qur'an and Hadith lessons just involved reading over and over in front of the class, it made me feel sleepy. But when we used the game with levels and timed quizzes, I wanted to keep trying until I got three stars. Memorizing felt like playing a game."

The subject teacher (G-01) also confirmed a change in students' learning behavior in class:

"The students have become very proactive. Even before class starts, they're already asking if there's an interactive quiz or a new leaderboard today. Gamification has successfully dispelled the impression that Qur'an and Hadith is a 'heavy' and boring subject."

b. Theme 2: Strengthening Memory Retention through Instant Feedback

Gamification mechanisms that provide immediate feedback when students answer quizzes on tajwid rules or rearrange jumbled verses of the Qur'an accelerated the process of correcting misconceptions. When students made mistakes in matching verse fragments or applying tajwid rules, the gamification platform immediately provided visual corrections. Based on observation sheet analysis, repeated interactions (loops) with gamified media helped strengthen students' long-term retention of *mufrodat* (vocabulary) and hadith content. Student S-05 stated:

"If I make a mistake while arranging verse fragments in the game, I can immediately see where the error is, and there's an audio cue. So I always remember the correct verse connections during the exam."

c. Theme 3: Fostering Collaboration Through Structured Competition

Although leaderboard elements have the potential to spark individual competition, the group-based gamification design implemented in this study encouraged peer tutoring. Students with stronger memorization skills voluntarily helped their groupmates so that their group could accumulate collective points and win weekly badges. Table 4 presents a triangulation matrix linking specific gamification elements to the psychological and academic impacts observed in students.

Table 4. Triangulation Matrix of Gamification Elements, Impact Indicators, and Data Verification

Gamification Elements	Academic and Psychological Impact Indicators	Classroom Observation Evidence	Key Informant Quotes
Points & Badges	Increasing Extrinsic Motivation & the Transition to Intrinsic Motivation	Students are scrambling to finish their verse worksheets on time to earn bonus points.	"I'm working toward the 'Little Hafiz' badge so my name can be displayed on the honor roll." (S-04)
Leaderboards	Response Speed & Efforts to Prevent Learning Loss	Student attendance increased by 98%; no students were late in turning in their assignments.	"Seeing our group's ranking go up motivates us to study as a group during break time." (S-01)
Progress Bar/Leveling	Metacognitive Awareness & Independent Learning	Students can independently assess the extent to which they have mastered the tajwid material.	"Students now know where their memorization weaknesses lie without me having to point them out." (G-02)
Team Quests	Peer Tutoring & Empathy	High-achieving students help those who have trouble memorizing in order to earn team points.	"Group learning comes to life; the children listen to each other recite what they've memorized." (G-01)

3. Synthesis of Quantitative and Qualitative Findings (Integration)

The integration of quantitative and qualitative data makes it clear that the success of gamified learning in improving test scores ($M = 84.50$, $p < 0.001$) was not merely driven by the use of digital technology, but rather by fundamental improvements in students' overall learning experience. Qualitative data demonstrate that post-test score increases in the experimental group were driven by high time-on-task with subject matter. Gamification elements gradually fostered three basic psychological needs according to Self-Determination Theory (SDT):

1. **Autonomy:** Students were free to choose practice paths or levels matching their learning pace.
2. **Competence:** Instant feedback provided a sense of accomplishment when completing memorization challenges.
3. **Relatedness:** The dynamics of team quests strengthened social bonds among students.

Thus, the results empirically refute the conventional assumption that integrating game elements diminishes the seriousness of studying the Qur'an and Hadith. On the contrary, ethically and structurally designed gamification serves as an effective pedagogical catalyst for enhancing mental engagement, motivation, and cognitive achievement among elementary-level students.

DISCUSSION

The empirical findings of this study demonstrate that integrating gamified learning into Qur'an and Hadith instruction yielded a statistically significant positive effect on students' cognitive post-test outcomes ($M_{exp} = 84.50$, $M_{ctrl} = 72.17$, $p < .001$, $n_p^2 = 0.462$). Qualitative observations complemented these numerical data by illustrating positive shifts in classroom participation and peer interaction. To provide a rigorous analysis, this section interprets these findings through four main axes: (1) plausible psychological and pedagogical mechanisms, (2) a critical comparison with existing literature and alternative explanations, (3) refined theoretical and practical implications, and (4) study novelties alongside research limitations.

1. Pedagogical Dynamics and Psychological Interpretation

The observed improvement in post-test scores within the experimental group suggests that structuring Qur'an-Hadith learning through interactive game mechanics may offer a useful instructional alternative to traditional mechanical

repetition (drill and practice). Primary Qur'an-Hadith education involves hierarchical cognitive tasks, ranging from recognizing *tajwid* rules to accurately reciting and arranging verse fragments (Hasanah & Suryana, 2022).

From the perspective of Cognitive Load Theory (CLT) (Sweller, 2020), immediate visual and auditory feedback provided during gamified tasks may serve as cognitive scaffolding. By identifying mispronunciations or structural errors in real time, the system can potentially reduce extraneous cognitive load, thereby enabling students to allocate mental resources toward schema acquisition and verse retention. However, because cognitive load parameters (e.g., mental effort or working memory capacity) were not directly measured using standardized instruments in this study, CLT is positioned here as a plausible theoretical framework rather than a proven physiological mechanism.

Similarly, student reports of heightened engagement can be interpreted through Self-Determination Theory (SDT) (Sailer et al., 2017). The gamified activities provided opportunities for autonomy (selecting task pathways), competence (visualizing progress via badges), and relatedness (collaborating on group quests). Nevertheless, because intrinsic motivation was not measured via validated SDT psychometric scales, the qualitative observations regarding student enthusiasm should be interpreted as reported participant experiences rather than definitive evidence of a structural shift from extrinsic to intrinsic motivation.

2. Critical Comparison with Literature and Alternative Explanations

While these results align with general meta-analyses indicating positive gamification effects on learning outcomes (Majuri et al., 2018; Sailer & Homner, 2020; Umam & Supriadi, 2023), a rigorous evaluation requires acknowledging alternative explanations and potential boundary conditions.

Critical Evaluation of Sacredness and Social Dynamics

Critics of educational technology in religious instruction, such as (Ahmad & Kasim, 2020) and (Zulkifli et al., 2020), have expressed concerns that game elements might erode student reverence (*ta'dzim*) for sacred texts or foster hyper-competitive individualism through leaderboards. Qualitative observations in this study indicated that group-based leaderboards encouraged peer tutoring rather than friction. However, claiming that these findings "refute" earlier concerns would be overstating the data, as spiritual reverence (*ta'dzim*) and sacredness were not measured as independent outcome variables. The findings merely suggest that team-based gamification can be implemented without immediate observational evidence of disruptive behavior.

Alternative Explanations and Uncontrolled Variables

The positive gains observed in the six-session intervention must be evaluated against several methodological confounders:

- Novelty Effect:** The sudden introduction of digital applications (e.g., Kahoot or Quizizz) often induces temporary excitement, which may diminish over extended periods (Bai et al., 2023).
- Hawthorne and Teacher Effects:** Increased attention from researchers and variations in teacher enthusiasm during the intervention could account for a portion of the performance variance.
- Side Effects of Gamification:** Literature highlights potential drawbacks such as leaderboard anxiety, reward dependency, or disengagement among low-performing students when faced with public competition (Dichev & Dicheva, 2017; Toda et al., 2024).

Table 5. Synthesis of Present Findings with Key Prior Research

Researcher & Year	Context/Subject	Methodology	Reported Findings	Critical Alignment with Present Study	Perspective &
Majuri et al. (2018)	General STEM Education	Meta-Analysis	Gamification increases engagement and learning gains.	Supports. Shows that cognitive benefits observed in STEM extend to religious education contexts.	
Ahmad & Kasim (2020)	Islamic Education	Qualitative	Digitization risks reducing religious propriety and sacredness.	Nuanced Alternative. Our qualitative data showed no overt loss of decorum, though spiritual reverence (<i>ta'dzim</i>) was not formally measured.	
Zulkifli et al. (2020)	Qur'anic Studies	Experiment	Conventional drill methods excel in pronunciation accuracy.	Complementary. Suggests that traditional repetition can be embedded within feedback-rich gamified structures.	

Researcher & Year	Context/ Subject	Methodology	Reported Findings	Critical Alignment with Present Study	Perspective & Contribution
Hamari & Koivisto (2023)	Educational Technology	Meta-Analysis	Long-term gamification effects decline due to novelty fatigue.	Contextualizes. Highlights that our 6-session intervention gains may reflect short-term novelty rather than permanent retention.	
Present Study (2026)	Qur'an-Hadith at MI	Mixed-Methods	Significant post-test gains ($p < 0,001$; $n_p^2 = 0,462$) in a single-school sample	Contextualized Demonstrates effectiveness acknowledging sample size and unmeasured psychological constructs..	Contribution. short-term while limitations

3. Refined Implications

a. Theoretical Propositions

Rather than claiming a definitive new theoretical model, this study proposes the concept of "*Pedagogical Munasabah in Digital Learning*" as a tentative proposition requiring further empirical validation. This proposition posits that digital game mechanics in religious education should remain aligned (*munasabah*) with the spiritual and ethical objectives of the curriculum. Furthermore, the study illustrates how basic SDT and CLT concepts can serve as helpful analytical lenses for evaluating digital interventions in Islamic elementary schools.

b. Practical Guidance for Stakeholders

- 1) Educators: Teachers should view gamification as a short-term, complementary instructional tool rather than a complete substitute for traditional pedagogical methods.
- 2) Curriculum Developers: Educational policy should prioritize balanced gamified module designs that emphasize collaborative quests over individualistic competition.
- 3) EdTech Developers: Developers should integrate features that support peer collaboration and customizable difficulty levels to mitigate competition anxiety.

4. Novelty and Research Contribution

This study offers significant novelty in three key aspects that have not been comprehensively addressed by previous studies:

- a. Conceptual and Content Novelty: This is one of the first studies to explicitly combine modern gamification mechanics (points, badges, leaderboards, team quests) with Qur'an and Hadith learning content at the Islamic Elementary School/Madrasah Ibtidaiyah level. Previous research has primarily examined gamification in general subjects (Science, Mathematics, English), while studies on the Qur'an and Hadith have almost always focused on evaluating conventional memorization methods (*wahdah, takrir, muraja'ah*).
- b. Methodological Innovation: This study fills a methodological gap by employing a mixed-methods sequential explanatory design that precisely measures the magnitude of the quantitative effect ($n_p^2 = 0.462$) while simultaneously uncovering the qualitative dynamics of perception underlying these statistical figures. This approach overcomes the limitations of purely qualitative studies, which are often considered to lack statistical generalizability, as well as those of purely quantitative studies, which are often blind to students' subjective experiences.
- c. Innovations in Ethical Gamification Design (Collaborative Gamification Framework): This study reformulates the use of leaderboards, shifting them from an individualistic-competitive orientation to a collaborative-team quest orientation. This reformulation successfully demonstrated empirically that gamification can be applied to the study of the Qur'an without undermining the values of Islamic brotherhood (*ukhuwah Islamiyah*) and cooperation among students.

5. Research Limitations and Directions for Future Research

- a. Sample and Scope: The study was restricted to 60 fifth-grade students in one school over six sessions. Empirical effectiveness applies strictly to this specific context and cannot be generalized to Madrasah Ibtidaiyah schools as a whole.
- b. Unmeasured Constructs: Intrinsic motivation, cognitive load, and spiritual reverence were not directly measured via psychometric scales.

- c. Future Research: Subsequent studies should utilize multi-site randomized trials, deploy validated psychometric instruments for motivation and cognitive load, investigate long-term retention to account for novelty effects, and explore adaptive, AI-supported learning systems (Al-Farsi & Hassan, 2024).

CONCLUSION

This study examined the effectiveness and implementation of gamified learning in Qur'an-Hadith instruction through a sequential explanatory mixed-methods design. Based on the empirical findings, three core conclusions are drawn:

1. Learning Achievement: Quantitative analysis demonstrates that students participating in gamified learning achieved significantly higher post-test learning outcomes than those receiving conventional instruction, after controlling for baseline achievement levels.
2. Qualitative Insights: Qualitative evidence indicates that game elements (points, badges, challenges, leaderboards, and team-based activities) supported student engagement by increasing participation, peer interaction, and responsiveness to immediate feedback.
3. Generalizability and Contextual Limitations: The evidence of effectiveness applies strictly to the context of a single school and a six-session intervention involving 60 fifth-grade students. Due to the non-equivalent control group design, small sample size, and short intervention duration, these findings cannot be generalized to Madrasah Ibtidaiyah schools as a whole.

Future research should employ larger, multi-site samples and longitudinal assessments to examine long-term learning retention, as well as explore adaptive AI-supported gamification systems within Islamic education.

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ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to all parties who contributed to this research.

AUTHOR CONTRIBUTION STATEMENT

Dian Rif'iyati and Dirasti Novianti contributed to the conceptualization, research design, data collection, data analysis, and manuscript preparation. All authors have read and approved the final version of the manuscript.

AI DISCLOSURE STATEMENT

The authors declare that artificial intelligence (AI) tools were used in a limited capacity to assist in language editing and improving the clarity of the manuscript. All ideas, analyses, and conclusions presented in this study are the original work of the authors, and they take full responsibility for the content of this manuscript.

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