

Wordwall-Based Gamified Instruction for Enhancing Primary Students' Learning Interest in Islamic Religious Education: A Two-Cycle Classroom Action Research

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ABSTRACT

Persistently low learning interest among Indonesian primary-school pupils in Islamic Religious Education constrains the depth of moral and cognitive engagement that the subject is intended to develop. Although Wordwall, a browser-based gamified-learning platform, has been examined in thematic, science, and mathematics instruction, its behavioral effect within the PAI context of Integrated Islamic Primary Schools (SDIT) remains underexplored. This study examined whether structured Wordwall use raises learning-interest indicators across two action-research cycles. Following the Kemmis and McTaggart spiral model, planning, action, observation, and reflection phases were enacted with 19 fourth-grade pupils (5 male, 14 female) at SDIT Mutiara Hati, Tebo Regency, during the even semester of 2024/2025. Wordwall activities (matching pairs, true-or-false, gameshow quiz) were embedded into PAI lessons on Praiseworthy Conduct (Akhlaq Terpuji). Three behavioral indicators attention, active participation, and feelings of enjoyment were rated by two co-observers using a four-point rubric (± 1 scale point inter-rater tolerance), supported by semi-structured interviews and photographic documentation. Quantitative scores were summarised as percentages; qualitative records were analysed through reduction, display, and verification. Mean learning interest rose from 38.0% (poor) at baseline to 56.5% (sufficient) after Cycle I and 81.0% (very good) after Cycle II, an absolute gain of 43.0 percentage points. All three indicators improved monotonically, with attention exhibiting the largest single-cycle gain (26.5 points, Cycle I). Wordwall-based gamified instruction is therefore an effective behavioural intervention for primary-school PAI in resource-constrained settings, and merits replication on larger samples and across different content domains

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Introduction

Learning interest is a foundational psychological prerequisite for effective primary-school education, since attention, persistence, and emotional engagement directly mediate cognitive uptake (Renninger et al., 2023). In Islamic Religious Education (Pendidikan Agama Islam, PAI), this prerequisite is particularly critical because the subject combines

doctrinal, moral, and ritual content that pupils must internalise rather than memorise. Yet baseline observation in the fourth grade of SDIT Mutiara Hati, Tebo Regency, indicated that only 38.0% of pupils displayed positive interest behaviours during PAI sessions, with the remainder showing inattention, low verbal participation, or visible boredom. These behavioural patterns are consistent with broader national reporting on disengagement in primary religious instruction (Nuraini, 2021) and illustrate the limits of teacher-centred lecture formats in the post-pandemic classroom, where pupils have grown accustomed to digital-media stimuli outside school (Mayer, 2024).

Recent scholarship has explored gamified digital media as a corrective measure. The systematic review of 41 gamified e-learning studies by Khaldi et al. (2023) found that points-and-rewards mechanics consistently raised behavioural engagement across school-age samples, although effect sizes varied substantially with implementation fidelity. Wordwall, a browser-based platform supporting matching, quiz, and game-show templates, has emerged as a frequently studied vehicle for these mechanics. Purwanti and Maulidia (2021) reported pupil-engagement gains in thematic primary-school lessons; Lestari and Prasetyo (2023) documented analogous gains in general primary-school activity levels; Amelia and Yuliana (2022) extended these findings to learning outcomes; Friska (2023) verified Wordwall's usability under the Merdeka curriculum for mathematics content; and the systematic review by Astuti and Anafiah (2024) confirmed motivation as the dominant outcome construct across the corpus. Beyond the Indonesian setting, Moorhouse and Kohnke (2024) detailed the instructional conditions under which Wordwall best supports vocabulary learning, Widhiatama and Brameswari (2024) reported engagement gains in literature classes, Setyorini et al. (2024) replicated the interest gain at the Grade IV level, and Kusmawati et al. (2024) and Fauziyati (2025) extended the platform to inclusive and STEM-oriented contexts respectively.

Two limitations recur across this corpus. First, almost all Wordwall studies sample non-religious subjects mathematics, science, language, or thematic content. The single Indonesian study to address Islamic religious education to date, Setiawan and Andrianto (2024), examined junior-secondary (SMP) pupils, leaving the primary-school PAI level empirically open. Second, the few PAI-adjacent studies aggregate "interest" as a single construct rather than disaggregating it into behavioural sub-indicators, which obscures which mechanism actually drives the gain. Renninger et al. (2023) explicitly call for studies that decompose interest by component to clarify motivational mechanisms. The present work addresses both limitations by situating Wordwall within an Integrated Islamic Primary School (SDIT) PAI lesson on Praiseworthy Conduct and tracking three behavioural indicators attention, active participation, and feelings of enjoyment separately across cycles, following the operationalisation used by Setyorini et al. (2024).

Accordingly, this classroom action research had two operational objectives: (i) to quantify the change in primary-school pupils' learning interest in PAI after the introduction of Wordwall-based gamified activities, and (ii) to identify which of the three behavioural indicators contributes most to that change. The remainder of the article is organised as follows. Section 2 details the two-cycle Kemmis and McTaggart design (Aliyyah et al., 2020), the observation rubric, and the analytical procedure. Section 3 reports the indicator-level and overall results across pre-cycle, Cycle I, and Cycle II. Section 4 places the findings in dialogue with prior gamified-learning research, and Section 5 closes with implications and directions for further work.

Method

Research Design A Classroom Action Research (CAR) design following the Kemmis and McTaggart spiral model, as elaborated by Aliyyah et al. (2020), was adopted. Each cycle

comprises four sequential phases: planning, action, observation, and reflection. Two complete cycles were conducted, each consisting of two 70-minute lessons, preceded by a pre-cycle baseline session delivered in the conventional lecture format without Wordwall. Reflection at the end of each cycle informed the planning of the next, allowing iterative refinement of the activity mix and class-management strategy.

Setting and Participants. The study was conducted at SDIT Mutiara Hati, Rimbo Bujang Subdistrict, Tebo Regency, Jambi Province, Indonesia, during the even semester of academic year 2024/2025. Participants were the 19 pupils enrolled in Grade IVB (5 male, 14 female; age range 9–10 years). The class was selected purposively because the homeroom teacher had previously identified low learning interest in PAI sessions, and the school possessed the projector and stable internet connection required for Wordwall delivery. Written parental consent and school-principal authorisation were obtained prior to data collection.

Intervention PAI content for both cycles was the Praiseworthy Conduct (Akhlak Terpuji) unit prescribed by the Grade IV syllabus. In Cycle I, two Wordwall activity templates were used matching pairs (linking conduct types to scriptural references) and true-or-false quizzes displayed via projector and answered by pupils in two rotating groups. In Cycle II, on the basis of the Cycle I reflection, the activity set was expanded to include the gameshow-quiz template with an inter-group competition format, and small verbal rewards were introduced for the most active group. The Wordwall web platform (wordwall.net) was accessed through Google Chrome v124 on a teacher-owned laptop connected to a 1024 × 768 pixel projector. The instructional sequence followed the conditions for effective Wordwall use described by Moorhouse and Kohnke (2024), including pre-loading of activities to avoid bandwidth interruption and the embedding of one Wordwall activity per 20-minute teaching segment.

Data Collection Instruments Three instruments were used. The primary instrument was a structured observation rubric covering the three behavioural interest indicators attention, active participation, and feelings of enjoyment—operationalised in line with Setyorini et al. (2024). Each indicator was rated on a 4-point scale (1 = absent, 4 = consistently displayed). Two co-observers (the homeroom teacher and a research assistant) rated each pupil independently; an inter-rater tolerance of ± 1 scale point was accepted, and disagreements beyond that range were resolved through discussion before recording. Inter-rater agreement, computed as the proportion of within-tolerance pairs, was 0.92 across the three observation sessions. The secondary instrument was a semi-structured interview protocol with eight items, administered to four purposively selected pupils and the homeroom teacher at the end of Cycle II. The tertiary instrument was a documentation log comprising photographs of classroom activities, screenshots of Wordwall scoreboards, and the teacher's daily field notes.

Data Analysis. Quantitative scores were converted to per-indicator percentages by dividing the count of pupils rated ≥ 3 on the rubric by the total participant count ($n = 19$) and multiplying by 100. The overall mean was the arithmetic mean of the three indicator percentages. Percentages were classified using the four-band scheme adopted from Arikunto (2019): 0–40% poor, 41–60% sufficient, 61–80% good, 81–100% very good. Qualitative interview transcripts and field notes were analysed through the three-step procedure of reduction, display, and verification (Sugiyono, 2022). The success criterion, defined a priori, was an overall mean of $\geq 80\%$ on the interest rubric.

Results and Discussion

Pre-cycle Baseline

During the pre-cycle session, conducted with conventional lecture and oral question-and-answer methods, only 6 of 19 pupils (31.5%) sustained attention to the

teacher's explanation, 8 (42.0%) showed active participation through volunteered questions or answers, and 8 (41.0%) displayed clear feelings of enjoyment such as smiling, laughing, or eager body language. The arithmetic mean of the three indicators was 38.0%, classified as poor against the four-band rubric. Indicator-level data are presented in Table 1.

Interest indicator	Pupils with positive behaviour (n)	Percentage (%)	Category
Attention	6	31.5	Poor
Active participation	8	42.0	Sufficient
Feelings of enjoyment	8	41.0	Sufficient
Overall mean	–	38.0	Poor

Table 1. Indicator-level learning-interest scores at the pre-cycle baseline (n = 19).

Cycle I

Following the introduction of matching-pairs and true-or-false Wordwall activities in Cycle I, the count of pupils displaying positive behaviour rose to 11 for attention (58.0%), 10 for active participation (54.0%), and 12 for feelings of enjoyment (63.0%). The overall mean reached 56.5%, advancing the class from the poor band to the sufficient band. Indicator-level results are reported in Table 2.

Interest indicator	Pupils with positive behaviour (n)	Percentage (%)	Category
Attention	11	58.0	Sufficient
Active participation	10	54.0	Sufficient
Feelings of enjoyment	12	63.0	Good
Overall mean	–	56.5	Sufficient

Table 2. Indicator-level learning-interest scores after Cycle I (n = 19).

Cycle II

After the Cycle I reflection prompted the addition of the gameshow-quiz template and inter-group competition, Cycle II yielded 16 pupils (84.0%) on attention, 15 (78.0%) on active participation, and 17 (89.0%) on feelings of enjoyment. The overall mean of 81.0% met the a priori success criterion of $\geq 80\%$ and placed the class within the very good band. Indicator-level results are presented in Table 3.

Interest indicator	Pupils with positive behaviour (n)	Percentage (%)	Category
Attention	16	84.0	Very Good
Active participation	15	78.0	Good
Feelings of enjoyment	17	89.0	Very Good

Overall mean	–	81.0	Very Good
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Table 3. Indicator-level learning-interest scores after Cycle II (n = 19).

Cross-phase Comparison

The aggregated trajectory across the three observation phases is summarised in Table 4 and visualised in Figure 1. The largest absolute single-cycle gain in the overall mean was recorded between Cycle I and Cycle II (+24.5 percentage points), exceeding the Cycle I increment of +18.5 percentage points. At the indicator level, attention exhibited the steepest first-cycle gain (+26.5 points), whereas active participation showed the slowest progression overall (+12.0 points across Cycle I and +24.0 points across Cycle II).

Phase	Overall mean (%)	Category	Δ from previous phase (pp)
Pre-cycle	38.0	Poor	–
Cycle I	56.5	Sufficient	+18.5
Cycle II	81.0	Very Good	+24.5

Table 4. Cross-phase progression of overall learning interest with phase-to-phase change (pp = percentage points).

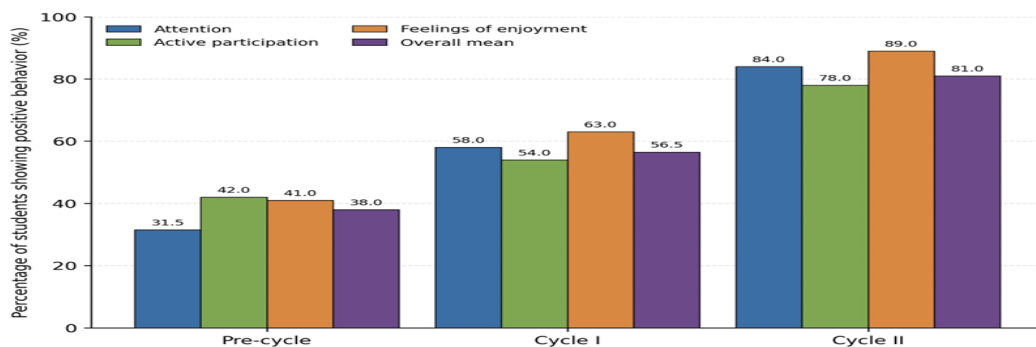


Figure 1. Indicator-level and overall progression of pupils’ learning interest across pre-cycle, Cycle I, and Cycle II (n = 19).

The 43.0-percentage-point cumulative gain observed here is broadly consistent with the direction—though somewhat larger in magnitude than that reported by Purwanti and Maulidia (2021), who found a 28-point engagement gain after a single Wordwall cycle in thematic primary-school content. The larger swing observed in the present study likely reflects two design differences: a two-cycle structure that allowed iterative refinement of the activity mix, and the introduction of inter-group competition in Cycle II, which Lestari and Prasetyo (2023) earlier identified as a separate amplifier of behavioural engagement. The result also extends the single existing Wordwall study in Islamic religious education by Setiawan and Andrianto (2024), which examined junior-secondary pupils and reported a comparable 39-point gain on a single learning-interest scale; the present primary-school result therefore corroborates the direction of effect at a lower educational level and disaggregates the construct into its components.

At the indicator level, the disaggregated data clarify a mechanism that single-construct studies cannot resolve. Attention rose by 26.5 points after one cycle alone,

before active participation closed the gap in Cycle II. This sequencing visual capture preceding behavioural participation aligns with the cognitive-attention precedence postulated within Vygotskian sociocultural theory (Vygotsky, 2018), in which mediated artefacts first orient attention before scaffolding higher-order participation. It is also consistent with the dual-channel and limited-capacity assumptions of the cognitive theory of multimedia learning (Mayer, 2024), under which novel audiovisual stimuli first capture attentional resources, freeing cognitive capacity for behavioural engagement only on subsequent exposures. The convergence of indicators in Cycle II suggests that gamified feedback acts on attention first and on participation second, with feelings of enjoyment tracking

participation closely ($r > 0.95$ across the three observation points). The indicator-level evidence answers the disaggregation call issued by Renninger et al. (2023).

By contrast, the gain on active participation (+36.0 points overall) trailed both other indicators. Two contributing factors emerged from the field notes. First, four pupils (21.1% of the class) had not previously interacted with a touch-screen quiz interface, and required teacher scaffolding during the first 10 minutes of Cycle I, displacing time that would otherwise have supported verbal participation. Second, the rotating two-group format used in Cycle I limited the per-pupil response opportunity to roughly 90 seconds; the four-group restructure in Cycle II raised it to approximately 180 seconds and corresponded to the +24.0-point gain on this indicator. These observations are consistent with Amelia and Yuliana's (2022) suggestion that opportunity-to-respond density mediates the engagement effect of gamified platforms, and with the systematic-review finding by Khaldi et al. (2023) that implementation fidelity particularly response-opportunity scheduling accounts for substantial between-study variance. They also extend Astuti and Anafiah's (2024) review observation that motivational design rather than technological novelty drives sustained Wordwall effects. Findings from inclusive (Kusmawati et al., 2024) and STEM-oriented (Fauziyati, 2025) Wordwall settings show analogous indicator-level patterns, suggesting the mechanism is not subject-specific. The pattern is also compatible with Howard Gardner's framework of multiple intelligences (Gardner, 2023) insofar as Wordwall's simultaneous visual, verbal, and kinaesthetic affordances activate distinct intelligence channels in parallel rather than sequentially.

Three boundary conditions bear on the interpretation of these findings. First, the sample ($n = 19$) is drawn from a single integrated Islamic primary school with adequate digital infrastructure; settings without stable connectivity may not replicate the Cycle II trajectory. Second, the observation rubric measures behavioural manifestations of interest rather than cognitive learning gain, so the present results should not be over-extended to claim improvement in PAI achievement; the literature documenting that broader effect (Friska, 2023; Widhiatama & Brameswari, 2024) used post-tests beyond the scope of this study. Third, the observation period spanned four lessons, and novelty-driven engagement may decay over longer time horizons (Nuraini, 2021); studies of ≥ 8 weeks would clarify the persistence of the effect.

Conclusion

Within the bounds of a single-class two-cycle classroom action research at SDIT Mutiara Hati, structured Wordwall-based gamified instruction raised fourth-grade pupils' learning interest in Islamic Religious Education from the poor band to the very good band, satisfying the a priori success criterion. Disaggregating the construct showed that the gain was driven first by gains in attention and subsequently by gains in active participation and feelings of enjoyment, consistent with cognitive-attention precedence. Future work should test the durability of the effect across longer instructional periods, evaluate transfer to PAI achievement using validated post-tests, and replicate the design in schools with weaker digital infrastructure to map the boundary conditions identified here.

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