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Effectiveness of a Plickers-Assisted Teams Games Tournament (TGT) Model on Student Learning Interest in Islamic Religious Education

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Abstract: Students' learning interest represents a crucial affective factor influencing engagement, persistence, and academic achievement. Nevertheless, instruction in Islamic Religious Education often remains teacher-centered and lacks interactive learning experiences, resulting in low student participation and motivation. This study aimed to examine the effectiveness of a Plickers-assisted Teams Games Tournament cooperative learning model in enhancing students' learning interest. A quantitative quasi-experimental method with a posttest-only control group design was employed. Participants were eighth-grade students at State Junior High School 1 Jati Agung, with two intact classes randomly assigned as experimental and control groups. The experimental group received cooperative learning through structured tournaments supported by a QR code-based Plickers response system, while the control group experienced conventional lecture-based instruction. Data were collected using a validated and reliable 20-item learning interest questionnaire covering enjoyment, engagement, attention, and curiosity. Statistical analyses included assumption testing, independent samples t-test, and effect size estimation. Results demonstrated that the experimental group achieved substantially higher learning interest scores than the control group. The independent samples t-test revealed a highly significant difference, $t(76) = 10.928$, $p < 0.001$. The magnitude of the effect was very large (Cohen's $d = 2.47$), indicating strong practical and educational impact. Students exposed to the intervention showed greater active participation, enthusiasm, sustained attention, and collaborative interaction during learning activities. The novelty of this study lies in integrating cooperative learning with an inclusive digital response system and emphasizing affective outcomes within Islamic Religious Education. The study contributes theoretically to technology-assisted cooperative learning literature and practically provides an accessible, low-cost, and replicable instructional strategy for fostering more engaging and student-centered classrooms.

***Abstrak**: Minat belajar merupakan faktor afektif kunci yang memengaruhi keterlibatan, ketekunan, dan keberhasilan akademik peserta didik. Namun, pembelajaran Pendidikan Agama Islam masih cenderung berpusat pada guru dan kurang interaktif sehingga partisipasi serta motivasi belajar rendah. Penelitian ini bertujuan menguji efektivitas model pembelajaran kooperatif Teams Games Tournament berbantuan Plickers dalam meningkatkan minat belajar peserta didik. Penelitian menggunakan metode kuantitatif dengan desain kuasi eksperimen posttest only control group. Subjek penelitian adalah peserta didik kelas VIII di State Junior High School 1 Jati Agung, dengan dua kelas utuh yang dipilih secara acak sebagai kelompok*

eksperimen dan kontrol. Kelompok eksperimen mengikuti pembelajaran kooperatif berbasis turnamen dengan sistem respons digital Plickers berbasis QR code, sedangkan kelompok kontrol menggunakan pembelajaran konvensional. Data dikumpulkan melalui angket minat belajar 20 butir yang telah terbukti valid dan reliabel, mencakup aspek kesenangan, keterlibatan, perhatian, dan rasa ingin tahu. Analisis data meliputi uji asumsi, independent samples t-test, serta perhitungan effect size. Hasil menunjukkan bahwa skor minat belajar kelompok eksperimen secara signifikan lebih tinggi dibandingkan kelompok kontrol. Uji t menghasilkan perbedaan yang sangat signifikan dengan nilai t(76) = 10.928 dan p < 0.001. Besaran pengaruh tergolong sangat besar dengan Cohen's d = 2.47, yang mengindikasikan dampak praktis yang kuat dalam konteks pembelajaran nyata. Peserta didik pada kelompok eksperimen menunjukkan peningkatan partisipasi aktif, antusiasme, perhatian berkelanjutan, serta interaksi kolaboratif selama proses pembelajaran. Kebaruan penelitian ini terletak pada integrasi model kooperatif dengan sistem respons digital inklusif serta fokus pada hasil afektif dalam konteks Pendidikan Agama Islam. Penelitian ini berkontribusi secara teoretis terhadap pengembangan pembelajaran kooperatif berbasis teknologi dan secara praktis menawarkan strategi yang mudah diterapkan, ekonomis, dan replikatif untuk menciptakan pembelajaran yang lebih interaktif dan berpusat pada peserta didik.

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INTRODUCTION

Learning interest is widely acknowledged as a fundamental determinant of students' academic success because it is closely associated with activeness, persistence, enthusiasm, and sustained motivation throughout the learning process. Students who demonstrate a high level of learning interest tend to comprehend instructional content more effectively, participate more actively in classroom activities, and achieve better learning outcomes (Moşteanu, 2021; Harefa et al., 2023; Lapitan et al., 2021). From a psychological perspective, learning interest strengthens both cognitive engagement and emotional involvement, which are essential for deeper information processing and meaningful knowledge construction. International evidence further confirms that students' cognitive and affective engagement significantly contributes to improved learning outcomes and long term retention (Chou, 2022; Gapol et al., 2025; Xu et al., 2023; Li et al., 2023).

Despite this importance, much of the existing literature remains descriptive and tends to conceptualize learning interest merely as an internal or motivational factor. Limited attention has been given to how instructional design and technology based strategies can systematically foster and sustain students' learning interest in classroom practice. Consequently, a comprehensive understanding of how pedagogical interventions shape learning interest is still insufficient and requires further empirical investigation (Abuhassna, 2024; Heilporn et al., 2021; Murayama, 2022; Leo et al., 2022).

In addition to internal characteristics, external learning conditions play a decisive role in cultivating students' learning interest. An interactive classroom climate, adequate facilities, and the effective integration of instructional technology have been shown to enhance engagement and participation (Anggraeni, 2021; Wang et al., 2022; Pandita & Kiran, 2023; Ong & Quek, 2023). Digital media, varied tasks, and game based learning environments can reduce monotony while stimulating intrinsic motivation and enjoyment. In particular, classroom response systems using QR code technology, such as Plickers, have been reported to increase participation, inclusivity, and emotional engagement because they allow every student to respond simultaneously without requiring personal devices (Chou, 2022; Sögüt & Belli, 2024; Gapol et al., 2025). These findings suggest that interactive technologies have strong potential to transform passive learning situations into more participatory and student centered experiences.

However, the integration of such innovations remains uneven, especially in Islamic Religious Education classrooms, where instructional practices often rely on conventional lectures and textbook based activities. A preliminary study conducted at State Junior High School 1 Jati Agung through classroom observations, interviews, questionnaires, and documentation involving teachers and eighth grade students identified several instructional challenges. These included limited facilities, teacher centered practices that restricted student interaction, minimal use of technology, overreliance on note taking, and low levels of student engagement. As a consequence, many students showed limited enthusiasm and attention during lessons, which negatively influenced both participation and learning outcomes.

These conditions were further supported by non test preliminary data obtained from a learning interest questionnaire administered to students. The results of the questionnaire are presented in Figure 1 below.

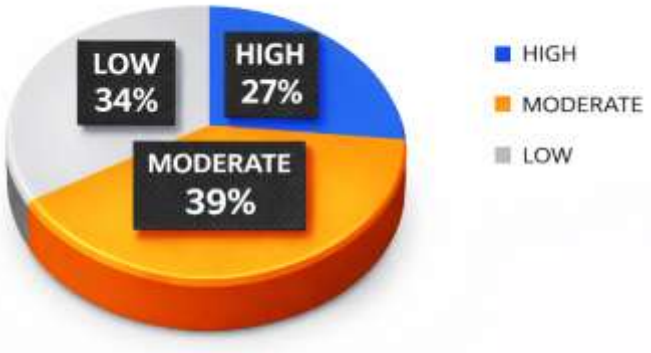

Figure 1. Pre-study results of the learning interest questionnaire

Based on Figure 1, only 27 percent of students were categorized as having high learning interest, while 39 percent were in the moderate category and 34 percent in the low category. These findings indicate that the majority of students have not yet developed optimal engagement with the learning process. The predominance of moderate and low interest levels highlights the urgent need for instructional innovation that can actively stimulate participation, enjoyment, and sustained attention.

One instructional strategy that offers strong potential to address this issue is the Teams Games Tournament cooperative learning model. This model emphasizes collaboration, healthy competition, peer tutoring, and the teacher's role as a facilitator (Patil et al., 2023; Silva et al., 2021; Yonwilad et al., 2025). Numerous studies have reported that Teams Games Tournament improves communication skills, critical thinking, and collaborative competence in various subject areas (Baydar, 2021; Jodoi et al., 2021; Ugrin et al., 2021). Structurally, this model consists of class presentation, team formation, games, tournaments or competitions, and team recognition, all designed to create an enjoyable yet academically competitive learning atmosphere (Maulidiyah, 2025; Araya, 2023; Hong et al., 2022). Heterogeneous grouping encourages mutual support and knowledge exchange, while reward systems stimulate enthusiasm and accountability (Farihatil et al., 2024; Zhou & Colomer, 2024; Ngoc Tuong Nguyen & Thi Kim Oanh, 2025; Agwu & Nmadu, 2023).

Nevertheless, a closer examination of previous studies reveals several important limitations. First, most research on Teams Games Tournament has been conducted using conventional or manual media such as printed cards, worksheets, or board based games. Second, many studies focus primarily on cognitive outcomes such as achievement and test scores, while affective outcomes, particularly learning interest, receive less systematic quantitative attention. Third, empirical investigations within the context of Islamic Religious Education remain scarce, even though this subject often faces challenges related to student motivation and perceived monotony. Finally, only a limited number of studies have explored the integration of cooperative learning models with digital or interactive response technologies.

These gaps indicate that current evidence is fragmented. Research rarely combines cooperative learning, interactive technology, and affective outcomes within a single experimental framework, especially at the junior secondary school level. As a result, there is still insufficient empirical proof regarding whether the integration of Teams Games Tournament with real time digital tools can substantially enhance students' learning interest in Islamic Religious Education classrooms.

This study addresses these limitations by systematically integrating the Teams Games Tournament model with Plickers media, a QR code based classroom response system that enables immediate feedback, inclusive participation, and game like interaction. The integration is expected to create a learning environment that is collaborative, competitive, interactive, and technologically enriched, thereby strengthening students' emotional engagement and interest in learning. The novelty of this study lies in three main aspects. First, it combines a cooperative learning model with a digital response system in a single instructional design. Second, it focuses specifically on learning interest as an affective outcome measured quantitatively through a quasi experimental approach. Third, it applies this innovation within the context of Islamic Religious Education at the junior secondary school level, a setting that has received limited attention in both national and international research.

Given the low levels of learning interest observed at State Junior High School 1 Jati Agung, instructional improvement is not merely desirable but necessary. Without immediate intervention, students may become increasingly disengaged from the learning process. Therefore, this study aims to evaluate the effectiveness of a Plickers Assisted Teams Games Tournament model on student learning interest in Islamic Religious Education. The research hypothesis proposes that there is a significant difference in students' learning interest between those who experience the integrated model and those who receive conventional instruction.

The findings of this study are expected to contribute theoretically to the development of technology assisted cooperative learning literature and practically to provide teachers and schools with evidence based strategies for designing more interactive and student centered learning environments. Through this contribution, the study seeks to enhance both the quality of classroom practice and the broader improvement of educational outcomes.

This study makes three key contributions to the field of educational technology and cooperative learning. It introduces a novel integration of the Teams Games Tournament model with Plickers as a real time digital response system, moving beyond traditional paper based implementations of cooperative games. It shifts the dominant research focus from cognitive achievement toward affective outcomes by rigorously examining learning interest through experimental analysis. It also expands the empirical landscape by providing evidence from Islamic Religious Education at the junior secondary level, a context rarely represented in technology assisted learning research. Through these contributions, the study bridges the gap between cooperative pedagogy, interactive technology, and student motivation, offering a replicable and evidence based instructional model for enhancing classroom engagement.

METHOD

This study employed a quantitative quasi experimental approach using a posttest only control group design to examine the effectiveness of a Plickers Assisted Teams Games Tournament model on students' learning interest in Islamic Religious Education. The quasi experimental design was selected because random assignment at the individual student level was not feasible within the natural school setting. Instead, intact classes were maintained to preserve the authenticity of classroom instruction while still enabling controlled comparison between treatment conditions. Such a design is widely recommended in educational intervention research to balance internal validity and ecological validity (Narita, 2021; Sims et al., 2022; Shadish et al., 2002; Creswell, 2012). The study was conducted during the first semester of the 2025 to 2026 academic year at State Junior High School 1 Jati Agung.

The research population consisted of all eighth grade students enrolled at the school, totaling 220 students. Sampling was carried out at the class level using simple random sampling to ensure comparable academic characteristics and to minimize selection bias. From the available classes, two intact classes were randomly selected and assigned to different conditions. Class VIII A served as the experimental group and Class VIII C served as the control group. Participants were

aged between 13 and 14 years and included both male and female students with relatively homogeneous socioeconomic backgrounds. All participants had previously experienced regular Islamic Religious Education instruction and had not been exposed to the Teams Games Tournament model or Plickers based learning activities. This condition ensured that the treatment effects were not influenced by prior familiarity with the intervention.

The experimental procedure followed a structured flow. Initially, participants were allocated into experimental and control groups. The experimental group received instruction through the Teams Games Tournament cooperative learning model integrated with Plickers media, whereas the control group received conventional teacher centered instruction. To control for extraneous variables, both groups were taught by the same teacher, followed identical learning objectives and instructional materials, and were allocated equal teaching time. After completion of the treatment period, all students completed a posttest questionnaire measuring learning interest under identical conditions. The resulting scores were then compiled and statistically analyzed to determine differences between groups.

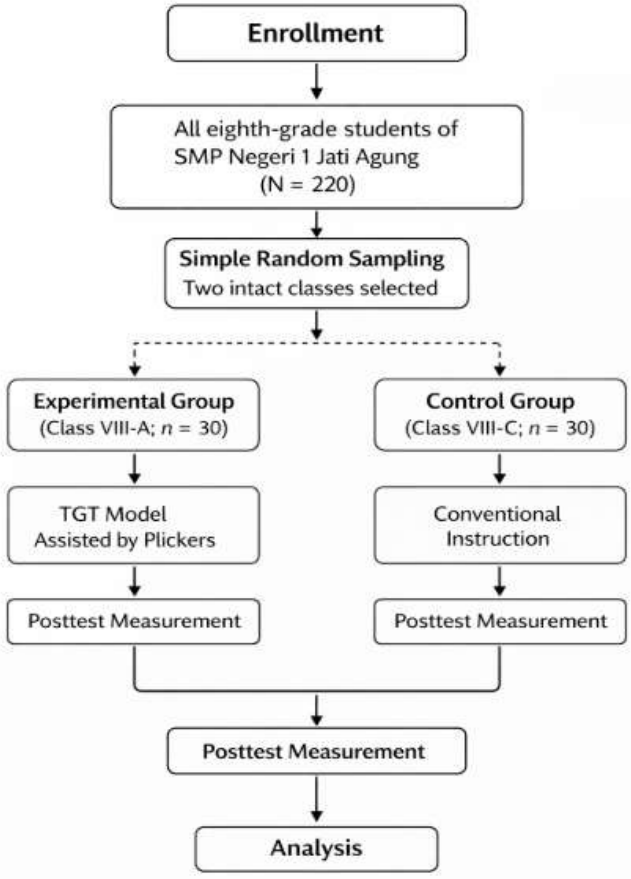

Figure 2. Flowchart of the quasi-experimental research design and participant allocation

The implementation of the Teams Games Tournament model supported by Plickers was conducted through systematic instructional stages. The teacher first presented the learning material concisely to establish conceptual understanding. Students were then organized into small heterogeneous teams of five to six

members to encourage peer collaboration. Team members engaged in discussion and peer tutoring to strengthen comprehension and mutual support. Academic games were subsequently conducted using questions delivered through Plickers, enabling all students to respond simultaneously through QR coded cards and allowing immediate feedback. Students then participated in tournament sessions in which individual scores contributed to team performance. Team points were accumulated, compared, and followed by recognition and rewards for high achieving groups to enhance motivation. Finally, the teacher conducted evaluation and lesson closure. Through these structured cooperative and interactive activities, key dimensions of learning interest, including enjoyment, engagement, attention, and curiosity toward the learning material, were stimulated throughout the learning process.

Students' learning interest was measured using a self report questionnaire consisting of 20 items developed based on four indicators: enjoyment of learning, active engagement, interest in learning materials, and attention during instruction. Content validity was established through expert judgment to ensure alignment between items and theoretical constructs. Construct validity was examined through item level analysis, and reliability was assessed using Cronbach's Alpha coefficient to determine internal consistency. The reliability results indicated satisfactory consistency, confirming that the instrument was appropriate for measuring students' learning interest.

Data collection was conducted through a posttest administered immediately after the intervention. All participants completed the questionnaire simultaneously under standardized testing conditions to maintain procedural consistency. Data analysis began with descriptive statistics to summarize the distribution of scores. Assumption testing included normality and homogeneity of variance tests to verify the suitability of parametric analysis. Subsequently, an independent samples t test was employed to evaluate statistically significant differences between the experimental and control groups. The significance level was set at 0.05. These analytical procedures enabled a rigorous assessment of the effectiveness of the Plickers Assisted Teams Games Tournament model in enhancing students' learning interest.

By combining intact class sampling, controlled instructional conditions, standardized measurement, and appropriate statistical testing within a quasi experimental framework, the study design strengthens causal interpretation while preserving the authenticity of real classroom practice. Therefore, any observed differences in learning interest can be more confidently attributed to the instructional intervention rather than to uncontrolled external factors.

RESULT AND DISCUSSION

RESULT

This study aimed to evaluate the effectiveness of the Plickers Assisted Teams Games Tournament model in enhancing students' learning interest in Islamic Religious Education. Prior to testing the research hypothesis, several preliminary analyses were conducted to ensure that the measurement instrument was

psychometrically sound and that the statistical assumptions for parametric testing were satisfied.

Instrument validity was first examined using Pearson Product Moment correlation to determine whether each questionnaire item accurately represented the construct of learning interest. With N = 27 and a critical value of r table = 0.367 at the 5 percent significance level, all calculated correlation coefficients exceeded the required threshold. This indicates that each item contributes meaningfully to measuring students' affective engagement and that no item required removal or revision. The consistency of validity across all items suggests strong construct representation and reduces the risk of measurement bias.

Table 1. Results of the Learning Interest Questionnaire Validity Test

Questionnaire items	$R_{calculated}$	R_{table}	Remarks
1	0,528	0,367	Valid
2	0,430	0,367	Valid
3	0,549	0,367	Valid
4	0,415	0,367	Valid
5	0,580	0,367	Valid
6	0,580	0,367	Valid
7	0,698	0,367	Valid
8	0,587	0,367	Valid
9	0,731	0,367	Valid
10	0,658	0,367	Valid
11	0,721	0,367	Valid
12	0,548	0,367	Valid
13	0,587	0,367	Valid
14	0,470	0,367	Valid
15	0,378	0,367	Valid
16	0,407	0,367	Valid
17	0,497	0,367	Valid
18	0,545	0,367	Valid
19	0,526	0,367	Valid
20	0,543	0,367	Valid

Reliability analysis was subsequently conducted using Cronbach's Alpha to evaluate internal consistency. The instrument produced a coefficient of 0.878, which is substantially higher than the minimum acceptable level of 0.60. This value indicates high reliability and suggests that students responded consistently across items measuring enjoyment, engagement, attention, and interest. High internal consistency strengthens confidence that variations in scores reflect genuine differences in learning interest rather than random error.

Table 2. Reliability Statistics

Cronbach's Alpha	N of Items
.878	20

Before proceeding to inferential statistics, assumption testing was performed. The Shapiro–Wilk test indicated significance values of 0.195 for the control group and 0.177 for the experimental group. Since both values exceed 0.05, the distribution of learning interest scores can be considered normal. The normality of the data justifies the use of parametric procedures, which provide more statistical power and precision in detecting group differences.

Table 3. Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Kelas_Kontrol	.096	30	.200*	.952	30	.195
Kelas_Eksperiment	.128	30	.200*	.951	30	.177

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Homogeneity of variance was then assessed to ensure comparability between groups. Levene's test results showed significance values ranging from 0.350 to 0.367 across different estimation approaches. All values were above the 0.05 threshold, indicating that the variability of scores in the experimental and control groups was statistically equivalent. This homogeneity confirms that any observed differences are unlikely to be caused by unequal dispersion of scores and supports fair comparison between groups.

Table 4. Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
MINAT BELAJAR	Based on Mean	.884	1	76	.350
	Based on Median	.823	1	76	.367
	Based on Median and with adjusted df	.823	1	75.011	.367
	Based on trimmed mean	.873	1	76	.353

After confirming these assumptions, hypothesis testing was conducted using an independent samples t test. The analysis revealed a two tailed significance value of $p < 0.001$ with $t(76) = 10.928$. This result indicates a highly significant difference in learning interest between students exposed to the Plickers Assisted Teams Games Tournament model and those receiving conventional instruction. The magnitude of the t statistic reflects a substantial separation between group means, suggesting that the intervention produced not only statistical but also educationally meaningful improvements. Descriptively, students in the experimental group consistently achieved higher average scores, demonstrating greater enjoyment, participation, and attentional engagement during learning activities.

Table 5. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
MINAT BELAJAR	Equal variances assumed	.884	.350	-10.928	76	<,001	-13.538	1.239	-16.006	-11.071
	Equal variances not assumed			-10.928	73.153	<,001	-13.538	1.239	-16.008	-11.069

To complement significance testing, effect size analysis was conducted to determine the practical strength of the intervention. The computed Cohen's d value was −2.475. While the negative sign indicates the direction of comparison, interpretation focuses on the absolute value. A magnitude of 2.475 far exceeds the conventional threshold for a large effect, indicating that the difference between groups is not merely detectable but substantial in real classroom terms. This suggests that the intervention has the capacity to meaningfully transform students' affective engagement rather than producing only marginal gains.

Table 6. Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
NILAI	Cohen's d	5.471	-2.475	-3.063	-1.877
	Hedges' correction	5.526	-2.450	-3.032	-1.859
	Glass's delta	5.986	-2.262	-2.928	-1.581

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Table 7. Criteria for Interpreting Cohen's d Effect Size

Cohen's d Range	Effect Size Interpretation
0.00–0.19	Very small
0.20–0.49	Small
0.50–0.79	Medium
0.80–0.99	Large
≥ 1.00	Very large

Taken together, these findings provide convergent evidence that the Plickers Assisted Teams Games Tournament model significantly and substantially enhances students' learning interest. The combination of strong instrument quality, satisfied statistical assumptions, highly significant differences, and very large effect sizes supports the robustness and credibility of the results.

DISCUSSION

The present study demonstrates that integrating cooperative learning with interactive digital technology significantly enhances students' learning interest in Islamic Religious Education. The statistically significant group differences, coupled with a very large effect size, indicate that the intervention is not only effective but also educationally impactful. These findings reinforce Osei & Bjorklund (2024), Wang et al., (2021), and Liao et al., (2023), argument that learning interest is strongly shaped by instructional design rather than solely by students' internal

dispositions. In other words, well structured pedagogical strategies can actively cultivate motivation and engagement.

Several mechanisms may explain the strength of the observed effects. The Teams Games Tournament model promotes collaboration, peer tutoring, and healthy competition, which create social interdependence and collective responsibility. Such characteristics are central to cooperative learning theory and are known to enhance active participation and accountability (Er et al., 2021; Qureshi et al., 2023; Gillies, 2023). At the same time, the integration of Plickers introduces immediate feedback and real time interaction, transforming assessment into an engaging and game like process. This combination reduces passivity, increases inclusivity, and ensures that every student participates simultaneously, thereby strengthening both cognitive and emotional involvement.

Compared with previous studies that used manual or conventional media, the present findings suggest that digital enhancement amplifies the motivational potential of cooperative learning. Research by Albadri (2023) and Alzubi (2023) reported positive outcomes using traditional tools; however, the current study demonstrates that QR code based response systems can further intensify engagement by providing instant, transparent, and interactive feedback. Similarly, while Dindar (2021) and Muttaqien et.al., (2021) confirmed the effectiveness of Teams Games Tournament in increasing participation, this study extends their conclusions by providing empirical evidence within Islamic Religious Education at the junior secondary level, a context that has been relatively underrepresented in international literature.

Beyond engagement, the intervention also appears to foster social development. Structured teamwork, tournaments, and shared rewards cultivate communication skills, leadership, and mutual support among students. These outcomes are consistent with the findings of Wongsaming et.al., (2023) and Chou (2022), who emphasized the role of cooperative models in strengthening solidarity. The use of Plickers further enhances fairness and transparency during evaluation, which may increase students' sense of responsibility and trust in the learning process.

Importantly, this study offers several contributions to the field. From a theoretical perspective, it extends cooperative learning theory by demonstrating that the integration of simple digital technologies can substantially strengthen affective outcomes, particularly learning interest. This finding highlights that technology does not merely support instruction but can function as a catalyst that intensifies the social and motivational mechanisms of cooperative learning. From a methodological perspective, the study contributes by employing a rigorous quasi experimental design combined with effect size analysis, thereby providing stronger causal and practical evidence than studies that rely solely on descriptive or correlational approaches. From a contextual perspective, the research broadens the empirical base of technology assisted pedagogy by focusing specifically on Islamic Religious Education, an area that has received limited attention despite its importance for character and value formation. From a practical perspective, the results provide teachers with an accessible, low cost, and scalable instructional strategy that can be implemented without requiring individual student devices.

Collectively, these contributions position the Plickers Assisted Teams Games Tournament model as both an innovative and evidence based approach for enhancing students' learning interest. The findings suggest that combining cooperative structures with interactive technology represents a promising direction for future instructional design and educational research across diverse subject areas and school contexts.

CONCLUSION

This study found that the Plickers-assisted Teams Games Tournament (TGT) cooperative learning model exerts a substantially greater impact on students' learning interest than initially expected. Statistical analysis revealed a highly significant difference between the experimental and control groups ($p < 0.001$) with a very large effect size (Cohen's $d = 2.47$), indicating not only statistical significance but also strong practical and educational relevance. Students exposed to the intervention demonstrated higher enjoyment, active engagement, sustained attention, and enthusiasm during learning activities. These findings challenge the long-standing assumption that learning interest in Islamic Religious Education is primarily influenced by internal motivation alone and open new discussions regarding the decisive role of instructional design and interactive technology in shaping students' affective engagement.

This study reinforces previous findings on the effectiveness of cooperative learning while simultaneously questioning the predominance of cognitive-oriented outcomes in earlier research. It introduces an innovative integration of the Teams Games Tournament model with Plickers as a real-time, QR code-based classroom response system, thereby expanding the scope of technology-assisted cooperative pedagogy. By empirically examining learning interest as an affective outcome within Islamic Religious Education at the junior secondary level, this research contributes a new instructional approach, contextual evidence, and methodological rigor that enrich scholarly discourse on cooperative learning, educational technology, and student motivation.

Despite its contributions, this study has several limitations. The research was conducted with a relatively small sample and within a single school context, which may limit the generalizability of the findings. Variations in demographic factors such as gender, age, and broader institutional settings were not extensively examined. Future studies are therefore recommended to involve larger and more diverse samples, apply longitudinal or mixed-method designs, and explore additional affective and cognitive variables to obtain a more comprehensive understanding of the intervention's impact. Further investigation across different subjects and educational levels is also encouraged to validate the scalability and sustainability of the Plickers-assisted TGT model in broader educational contexts.

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