

Improving Students' Interest And Volleyball Learning Outcomes Through Modified Games In An Islamic Senior High School

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Abstract

Objectives: This study aimed to improve students' interest and volleyball learning outcomes through modified games among Grade 10 students at Madrasah Aliyah Ash-Shomadiyah.

Materials and Methods: This classroom action research followed the Kemmis and McTaggart model and was conducted in two cycles. The participants were 50 Grade 10 students. Each cycle comprised planning, action, observation, and reflection. The game modifications included using a lighter ball, lowering the net, reducing the court dimensions and number of players, and simplifying the rules. Learning interest was measured using a questionnaire, whereas learning outcomes were assessed across the cognitive, affective, and psychomotor domains. Data were analyzed descriptively using means, percentages, and classical mastery rates.

Results: The proportion of students demonstrating adequate learning interest increased from 40.00% at baseline to 68.00% in Cycle I and 88.00% in Cycle II. The mean learning-outcome score increased from 68.24 ± 7.82 to 75.18 ± 7.15 and ultimately to 83.46 ± 6.48 . Classical mastery likewise increased from 36.00% to 64.00% and reached 88.00% in Cycle II. These changes were accompanied by more active participation, a more equitable distribution of ball contacts, better communication, and greater self-confidence.

Conclusions: Modified volleyball games were associated with improved student interest and learning outcomes. A lighter ball, a lower net, a smaller court, fewer players, and simplified rules created a more accessible learning environment and expanded students' opportunities to participate, practice, and experience success.

Keywords: game modification; Islamic senior high school; learning interest; learning outcomes; volleyball

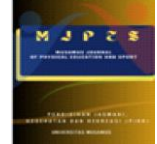
Introduction

Physical education involves more than using movement activities as lesson content; it also provides a medium for developing knowledge, attitudes, skills, and active-living habits. To achieve these aims, students need learning experiences that match their ability levels and provide meaningful opportunities for participation. In team-game instruction, however, participation is often uneven. Students who have already mastered the required techniques tend to dominate play, whereas less-skilled students have limited contact with the ball and may quickly lose interest.

Volleyball requires coordination, movement accuracy, understanding of rules, and teamwork. A standard ball, regulation net height, full-sized court, and conventional team size can create barriers for novice learners. The ball may feel hard, its trajectory may be difficult to control, and rallies may end quickly because of technical errors. When these conditions recur, active learning time decreases and students spend more time waiting than practicing. Consequently, a lesson intended to be enjoyable may instead be perceived as difficult and monotonous.

Initial observations of Grade 10 students at Madrasah Aliyah Ash-Shomadiyah indicated low interest in volleyball lessons. Of the 50 students, approximately 40% demonstrated adequate interest. Some perceived volleyball techniques as difficult, lacked confidence during play, and participated only minimally. This situation suggested a mismatch between task demands and student readiness. Instruction therefore needed to be improved so that every student could move, contact the ball, make decisions, and experience success.

One potential response is to modify the game. In this study, modifications involved using a lighter ball, lowering the net, reducing the court dimensions and number of players on each team, and



simplifying the rules. These adjustments did not remove the essential logic of volleyball. Rather, they preserved the structure of the game in a more accessible form, allowing students to learn techniques and tactical principles progressively.

Recent research indicates that game-based instruction can positively affect motivation, enjoyment, decision-making, and motor skills. The meta-analysis by Mo et al. (2024) showed that game-based physical education programs promote enjoyment among children and adolescents. Manninen et al. (2025) likewise found positive effects of game-based approaches on decision-making and motor skills, although effect magnitudes depended on implementation quality and teacher experience. These findings emphasize that games must be intentionally designed rather than used as unstructured free play without clear learning objectives.

More specific evidence from volleyball instruction points in the same direction. Batez et al. (2021) reported improvements in passing skills and enjoyment following a Teaching Games for Understanding program. García-González et al. (2020) found that a volleyball unit combining Sport Education and Teaching Games for Understanding was particularly beneficial for students with low initial motivation. In Indonesia, Amansyah and Hardinoto (2025) showed that a smaller court, lighter ball, simplified rules, and fewer players could improve learning motivation. Putra et al. (2025) also reported improved mastery of the underhand serve through modified games.

Although evidence concerning game-based approaches continues to develop, implementation must respond to actual classroom problems. Previous studies have predominantly used experimental designs or model-development approaches, whereas teachers often need a gradual improvement process that can be evaluated and refined during instruction. Classroom action research is relevant to this need because actions in Cycle II can be designed in response to weaknesses identified in Cycle I. The practical novelty of the present study therefore lies in the use of an integrated modification package that directly addressed barriers encountered by Grade 10 students at Madrasah Aliyah Ash-Shomadiyah and was refined through reflection between cycles.

Accordingly, this study aimed to improve students' interest and volleyball learning outcomes through modified games among Grade 10 students at Madrasah Aliyah Ash-Shomadiyah. The success of the action was evaluated through changes in learning interest, learning-outcome scores, and the percentage of classical mastery from baseline through Cycle II.

Materials and Methods

Study Design

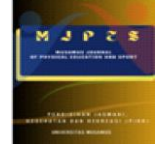
This study used classroom action research based on the spiral model developed by Kemmis and McTaggart. It was conducted in two cycles, each comprising four stages: planning, action, observation, and reflection. Cycle II was designed to address the limitations identified in Cycle I. The study took place during the 2025/2026 academic year at Madrasah Aliyah Ash-Shomadiyah in Singkawang City, Indonesia.

Study Participants

The participants were all 50 Grade 10 students at Madrasah Aliyah Ash-Shomadiyah, Singkawang City, comprising 27 boys and 23 girls. The class was selected because preliminary observations indicated that students' interest and mastery of volleyball learning had not met the school's established criteria. All students participated in instruction and assessment at baseline, in Cycle I, and in Cycle II; consequently, no data were excluded from the analysis.

Study Organization

At baseline, the researcher observed regular instruction, administered the interest questionnaire, and assessed learning outcomes. These data informed the action plan. In Cycle I, the teacher implemented modified volleyball games using a lighter ball, a 2.10-m net, a 12 × 6-m court, three players per team, and a maximum of three contacts before the ball had to be returned to the opponents' side.



Each lesson began with an orientation to the learning objectives and a warm-up. This was followed by simple games emphasizing ball contact and cooperation, technical practice in game contexts, small-sided matches, and a brief reflection. The teacher provided feedback on body position, ball direction, communication, and decision-making. An observer recorded student engagement, fidelity of action implementation, technical difficulties, and student responses.

Reflection after Cycle I compared observations, questionnaire findings, and skill assessments against the success indicators. In Cycle II, teams were composed more evenly, player rotation was clarified, playing distances were shortened, demonstrations were increased, and teacher feedback became more specific. These refinements were intended to increase the frequency of ball contacts and distribute participation more equitably.

Research Instruments

Learning interest was measured using a Likert-scale questionnaire covering attention, interest, enjoyment, willingness to participate, persistence, and self-confidence. The questionnaire was administered at baseline, after Cycle I, and after Cycle II.

Learning outcomes were assessed across the cognitive, affective, and psychomotor domains. The cognitive domain covered understanding of rules, basic principles, and the selection of actions during play. The affective domain included discipline, cooperation, responsibility, and sportsmanship. The psychomotor domain assessed the starting position, movement execution, ball direction, coordination, accuracy, and the ability to apply techniques during play. The school's minimum mastery criterion was 75.

Statistical Analysis

Data were analyzed descriptively to characterize changes from baseline to Cycle I and Cycle II. Interest and learning-outcome data were presented as frequencies, means, minimum and maximum scores, and percentages. Individual mastery was determined using the school's minimum mastery criterion, whereas classical mastery was calculated by dividing the number of students who achieved mastery by the total number assessed and multiplying the result by 100%. Changes between stages were calculated as percentage-point differences and mean-score differences. Observation data and field notes were analyzed through data reduction, thematic grouping, comparisons across cycles, and interpretation to explain the quantitative changes.

The action was considered successful when at least 70% of students demonstrated adequate learning interest and classical mastery reached at least 80%. Because this was classroom action research without a comparison group, the findings were interpreted as changes observed during implementation and were not used to make broad causal claims.

Results

All students completed the baseline, Cycle I, and Cycle II assessments. The analysis therefore included complete data from all 50 participants.

Table 1. Participant Characteristics

Characteristic	n	%
Boys	27	54.00
Girls	23	46.00
Total	50	100.00
Completed all assessments	50	100.00
Incomplete data	0	0.00

All 50 students participated throughout the study and completed every assessment. No data were excluded, and the primary analysis therefore included all 50 students.

Table 2. Changes in Learning Interest Across Study Stages

Stage	Mean	Minimum	Maximum	Category	Interested (%)
Baseline	62.84	48	78	20 students	40.00
Cycle I	71.36	56	86	34 students	68.00
Cycle II	80.92	65	94	44 students	88.00

At baseline, 20 students (40.00%) demonstrated adequate learning interest. Following the action in Cycle I, this number increased to 34 students (68.00%) and subsequently reached 44 students (88.00%) in Cycle II. Learning interest therefore increased by 48 percentage points from baseline to the end of the action and exceeded the 70% success criterion.

Table 3. Volleyball Learning Outcomes Across Study Stages

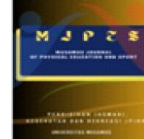
Stage	n	Mean	SD	Minimum	Maximum	Change
Baseline	50	68.24	7.82	52	82	—
Cycle I	50	75.18	7.15	59	89	+6.94
Cycle II	50	83.46	6.48	68	94	+8.28

The mean learning-outcome score at baseline was 68.24 ± 7.82 . In Cycle I, the mean increased to 75.18 ± 7.15 , representing a gain of 6.94 points. By Cycle II, the mean had reached 83.46 ± 6.48 . Overall, the mean score increased by 15.22 points relative to baseline.

Table 4. Mastery of Volleyball Learning Outcomes

Stage	Achieved mastery, n (%)	Not achieved, n (%)	Classical mastery	Status
Baseline	18 (36.00%)	32 (64.00%)	36.00%	Not achieved
Cycle I	32 (64.00%)	18 (36.00%)	64.00%	Not achieved
Cycle II	44 (88.00%)	6 (12.00%)	88.00%	Achieved

Classical mastery increased from 36.00% at baseline to 64.00% in Cycle I and 88.00% in Cycle II. The 80% success criterion was therefore achieved at the end of Cycle II.

**Table 5.** Summary of Action-Implementation Observations

Aspect	Cycle I	Reflection	Cycle II refinement/outcome
Active ball contact	Several students remained passive	Reduce team size and increase rotation	Ball contacts were distributed more evenly
Cooperation and communication	Communication remained inconsistent	Introduce communication cues	Communication became more frequent
Willingness to attempt skills	Less-skilled students remained hesitant	Add demonstrations and easier tasks	Self-confidence increased
Technical proficiency	Technical errors remained frequent	Simplify task difficulty	Technical execution improved
Lesson implementation	Waiting time remained evident	Use small-sided games	Active learning time increased

Observations during Cycle I indicated that student participation had improved relative to baseline, although several students remained passive and engagement was uneven across teams. Based on the reflection, Cycle II was refined by balancing team composition, clarifying player rotation, adjusting the level of difficulty, and providing more specific feedback. Following these refinements, ball contacts became more frequent and equitably distributed, communication improved, and students showed greater confidence in attempting the skills.

Discussion

This study demonstrated improvements in students' interest and volleyball learning outcomes after game demands were adjusted to their abilities. Learning interest increased from 40.00% at baseline to 68.00% in Cycle I and 88.00% in Cycle II. The mean learning-outcome score increased from 68.24 to 75.18 and ultimately to 83.46, while classical mastery rose from 36.00% to 64.00% and then to 88.00%. This pattern indicates that the action met the 70% interest criterion and the 80% classical-mastery criterion in Cycle II.

The increase in learning interest may be explained by a closer match between task demands and students' abilities. A lighter ball reduced apprehension and made it easier to control ball direction. A lower net and smaller court allowed rallies to continue for longer, while fewer players increased each student's opportunities to contact the ball. As students became more actively involved and experienced success more often, the lessons became more meaningful than technical drills dominated by queues and isolated repetitions.

This interpretation is consistent with Amansyah and Hardinoto (2025), who reported that volleyball modifications involving a smaller court, lighter ball, simplified rules, and fewer players improved student motivation. Their study used a quasi-experimental design, whereas the present study used classroom action research. Despite this difference, both point to the same mechanism: more accessible tasks allow participation to be distributed more evenly and reduce initial barriers to learning volleyball.

The findings for learning outcomes can also be compared with Putra et al. (2025). In their classroom action research, mastery of the underhand serve increased from 73.31% in Cycle I to 93.34% in Cycle II following the use of a plastic ball and modified games. Sahabuddin et al. (2025) similarly found increased engagement and volleyball skills through the V-ENGAGE model, which combines modified games, collaborative tasks, reflective discussion, and learning contexts relevant to students. The consistency of these findings strengthens the proposition that modification not only makes movement easier but also restructures learning opportunities.

From a game-based learning perspective, students learn techniques in purposeful situations. Passing, serving, ready position, communication, and movement are not practiced as isolated elements; rather, they are used to sustain the ball and solve game problems. Batez et al. (2021) showed that a Teaching Games for Understanding program improved volleyball passing skills and enjoyment



among secondary-school students. García-González et al. (2020) likewise reported benefits from a hybrid Sport Education–Teaching Games for Understanding approach, particularly for students who were initially less motivated.

Synthesis-level evidence supports this interpretation. Manninen et al. (2025) found that game-based approaches positively affect decision-making and motor skills. González-Valero et al. (2024) reported a meaningful effect of Teaching Games for Understanding on decision-making across educational levels. However, both reviews also caution that intervention effects depend on design quality, teacher experience, program duration, measurement instruments, and comparison conditions. The success observed here should therefore be linked to the specific actions implemented rather than merely to the label “modified games.”

The increase in interest was also related to enjoyment and perceived competence. The meta-analysis by Mo et al. (2024) showed that game-based physical education can enhance enjoyment among children and adolescents. Camacho-Sánchez et al. (2023) concluded that appropriately designed games and gamification tend to improve motivation and learning experiences. Among secondary-school students, Ezeddine et al. (2025) found greater intrinsic motivation and motor engagement following game-based instruction. These findings help explain why relatively small adjustments to equipment and rules can produce substantial changes in students’ experiences.

Reflection between cycles was central to the present study. Cycle I was used not only to assess outcomes but also to identify students who remained passive, unbalanced teams, rules that were too demanding, and excessive waiting time. The refinements introduced in Cycle II should be documented specifically because they clarify how the action worked. If mastery improves while participation remains concentrated among a few students, teachers still need to modify team composition, rotate roles, or impose contact limits to make learning opportunities more equitable.

In practice, games can be modified without changing the curriculum’s core objectives. Teachers may begin with two-versus-two or three-versus-three games, use a lighter ball, and establish simple rally targets before progressively increasing difficulty. Techniques should still be taught through demonstration and feedback, but practice should quickly return to a game context. This strategy allows lower-skilled students to develop without removing appropriate challenges for more-skilled students.

The findings should be interpreted in light of several limitations. First, the study involved only one class and no comparison group; consequently, the changes cannot be attributed entirely to the modified games. Second, the action period was relatively short and did not establish whether students’ interest and skills persisted after the intervention. Third, affective and psychomotor assessments may have been influenced by observer subjectivity because inter-rater reliability was not examined. Fourth, self-reported interest may have been affected by students’ tendency to provide socially desirable responses. Future studies should include a comparison group, follow-up assessment, instrument-reliability testing, and video recording to strengthen skill assessment.

Conclusions

The implementation of modified volleyball games was accompanied by improvements in interest and learning outcomes among Grade 10 students at Madrasah Aliyah Ash-Shomadiyah. Learning interest increased from 40.00% at baseline to 88.00% in Cycle II. The mean learning-outcome score increased from 68.24 ± 7.82 to 83.46 ± 6.48 , while classical mastery rose from 36.00% to 88.00%. The action success criteria were therefore achieved in Cycle II. A lighter ball, lower net, smaller court, fewer players, and simplified rules can serve as practical strategies for aligning instructional demands with students’ abilities. However, because the study did not include a comparison group, the findings should be understood as changes observed during the action rather than definitive causal evidence.

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Conflict of Interest

The authors declare no conflicts of interest related to this study.

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