

Improving Underhand Serve Skills in Volleyball Through the Boy-Boyan Game Approach for Fifth-Grade Students

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ABSTRACT

Elementary students frequently encounter difficulties with the underhand serve in volleyball, perceiving the technique as both challenging and monotonous, resulting in diminished engagement and inadequate skill acquisition. This study evaluates the effectiveness of the traditional Boy-boyan game to improve underhand serve skills among fifth graders at Elementary School 189 Inpres Cambajawa, Maros Regency. Using a Classroom Action Research (CAR) design over two cycles—comprising planning, action, observation, and reflection, the study involved 22 students selected through total sampling. Data were collected via performance tests, observation sheets, and documentation, then analyzed using quantitative descriptive methods. The results indicated a substantial, progressive enhancement in student performance. In the pre-cycle, the average score was 63.64 with a completion rate of only 14% (3 students). Following the intervention of Cycle I, the average rose to 71.31 (45% completion), which remained below the success threshold. In Cycle II, the average score increased dramatically to 86.65, with the completion rate reaching 95% (21 students), effectively surpassing the 80% classical success indicator. The findings indicate that the Boy-boyan game improves skills by aligning the mechanics of the traditional throwing motion with the underhand serve technique. Furthermore, the gamified approach created an enjoyable learning environment that reduced psychological barriers, boosting student confidence and motivation. This study concludes that integrating local traditional games into the modern sports curriculum is a highly effective strategy for enhancing motor skills and engagement in physical education.

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1. INTRODUCTION

Physical education is an integral component of the school curriculum, playing a vital role in students' holistic development, encompassing the physical, cognitive, emotional, and social domains (Aksir et al., 2024; Aprilo et al., 2025; Saqinah et al., 2025). Through structured physical activity, students are encouraged to develop motor skills, fitness, discipline, and a positive attitude toward a healthy lifestyle (Siedentop & Van der Mars,

2022). At the elementary school level, physical education instruction must be adapted to suit children's developmental characteristics, emphasizing enjoyment, safety, and active involvement (Moon & Lee, 2025).

Volleyball is one of the major sports compulsory for elementary school (Akhir et al., 2025; Azizin et al., 2024). Mastery of basic techniques such as serving, passing, smashing, and blocking is a key prerequisite for this game (Juhanis & Nurulita, 2024; Purnomo et al., 2022; Suhardiman et al., 2024). Among these techniques, the underhand serve is the most fundamental skill for beginners because it serves as the initial attack and determines the game's continuation (Saputra et al., 2022; Yasriuddin et al., 2024). According to Risma and Bakhtiar (2024), mastery of basic techniques is a crucial foundation for the development of more complex skills in the future.

However, empirical observations at Elementary School 189 Inpres Cambajawa, Maros Regency, revealed a gap between curriculum expectations and the reality on the ground. The majority of fifth-grade students have not yet mastered the underhand serve technique properly. The main challenges identified include poor arm coordination, an inability to generate sufficient power, and poor accuracy in ball direction. Consequently, students' learning completion rates fall below the minimum criteria. This aligns with Moy et al. (2024) findings that beginner players often struggle with serving techniques due to limited motor coordination and a lack of varied practice opportunities.

The root of this problem is suspected to stem from the dominance of conventional learning methods, which are rigid and teacher-centered. Approaches that rely solely on mechanistic repetition tend to reduce student motivation and active participation, given the characteristics of elementary school-aged children who naturally prefer learning through play (Li et al., 2024). Therefore, innovative instructional strategies are needed that integrate play elements into the achievement of motor competencies (Chang et al., 2020; Chen et al., 2017).

The game-based learning approach, particularly through the integration of traditional games, has proven effective in improving student motor skills and motivation (Camacho-Sánchez et al., 2023; Dese et al., 2025; Purwanto et al., 2024). Traditional games are not simply cultural heritage but also meaningful learning media that combine physical activity with enjoyable social interaction (Martínez-Santos et al., 2020; Setiawan et al., 2024). The game "Boy-boyan" has unique movement mechanics, where the ball-throwing motion in this game has a similar kinematic structure to the arm swing in a volleyball underhand serve (Dirgantara et al., 2023; Rahayu et al., 2021; Wati & Sari, 2024). This activity indirectly builds arm strength, hand-eye coordination, and aiming accuracy in a more relaxed setting.

The novelty of this research lies in the pedagogical modification that systematically transforms the traditional "Boy-boyan" movement pattern into a technical volleyball underhand serve. While previous studies have looked at how modified games work in general, there is still very little research on using the "Boy-boyan" game specifically to help elementary school students improve their underhand serve skills. The integration of local wisdom into this Classroom Action Research (CAR) framework offers a fresh and contextual learning model for students in Maros Regency.

Building upon this rationale, this study aims to improve volleyball underhand serve skills through the "Boy-boyan" game approach in fifth-grade students at Elementary School 189 Inpres Cambajawa. The results of this study are expected to provide theoretical and practical contributions to the development of more adaptive, inspiring, and effective physical education learning methods in elementary schools.

2. METHOD

This study employed a Classroom Action Research (CAR) design, adopting the Kemmis and McTaggart cycle model. This model was chosen for its systematic and continuous structure, allowing researchers to make precise instructional improvements. Operationally, this research was conducted in cycle units, each encompassing four essential stages: planning, acting, observing, and reflecting. The choice of CAR design was based on the need to directly address practical problems in the classroom. By using this reflective cycle, teaching methods were carefully created to tackle specific challenges students faced, and this is expected to greatly improve their learning results and skills in volleyball underhand serve techniques.

The research was conducted at Elementary School 189 Inpres Cambajawa, Maros Regency. The research subjects were all fifth-grade students, totaling 22 students. A total sampling technique was used because the population size was relatively small and manageable. The independent variable in this study was the boy-boy game approach, while the dependent variable was students' underhand serve skills in volleyball. The independent variable in this study was the boy-boy game approach, while the dependent variable was students' underhand serve skills in volleyball.

The research was conducted in two cycles. Each cycle consisted of two learning meetings and followed these stages: 1. Planning: Preparing lesson plans, learning scenarios using the boy-boy game approach, observation instruments, and assessment tools. 2. Action: Implementing the learning activities using the boy-boy game approach in volleyball lessons. 3. Observation: Observing students' learning activities, participation, and performance during the learning process. 4. Reflection: Analyzing the results of each cycle to identify strengths and weaknesses and planning improvements for the next cycle.

Data collection techniques were implemented comprehensively to ensure the validity of the research results. Primary data were obtained through a performance test to objectively measure students' volleyball underhand serve skills. Additionally, observation sheets were used to record student activity, participation, and engagement throughout the learning process. To strengthen the qualitative data and authenticate the research, documentation was also conducted, including field notes and visual documentation in the form of activity photographs.

The data analysis technique employed was quantitative descriptive analysis. Test data were processed to determine the average score (mean) and the percentage of learning completion in a classical manner. This analysis aimed to capture the development of students' abilities numerically from the beginning to the end of each cycle.

The indicators of success in this study were determined based on the Learning Objective Achievement Criteria. This classroom action research was deemed successful if at least 80% of the total students achieved a minimum score of 75. This threshold served as the primary reference for determining whether the action cycle could be stopped or required further reflection for the next cycle.

3. RESULTS AND DISCUSSION

Results

This research was conducted in two cycles of action, applying the traditional Boy-boy game approach to improve underhand serve skills in volleyball. Data analysis showed a significant and consistent improvement in student performance, starting from the pre-cycle stage to the final achievement in Cycle II.

Pre-Cycle Conditions

The results of the baseline test conducted before the intervention identified the underhand serve ability of fifth-grade students at Elementary School 189 Inpres Cambajawa as being in the very low category. The data showed that the average class score was only 63.64, with a very limited level of completion, with only 3 students, equivalent to 14% of the total students, being able to meet the minimum completion criteria. This finding confirms that the conventional learning approach previously implemented has not been able to effectively develop students' motor coordination, which is a crucial element in producing accurate underhand serve techniques.

Table 1. Lower Service Capability Observation Results (Pre-Cycle)

No	Assessment Indicators	Achievement Results	Category
1	Average Class Score	63.64	Very Low
2	Number of Students Passing	3 Siswa	-
3	Classical Completion Percentage	14%	Not Completed
4	Percentage of Students Not Passing	86%	Dominant
5	Minimum Completion Criteria	75*	-

Cycle I Results

Following the intervention in Cycle I, which involved the implementation of the traditional Boy-boy game approach, significant positive changes began to emerge in students' enthusiasm and basic skills in performing the underhand serve. Quantitatively, the data showed an encouraging upward trend, with the average class score rising to 71.31. This improvement was also reflected in the classical completion rate, which reached 45%, with a total of 10 students successfully meeting the completion criteria. This achievement represents a 31% increase compared to pre-cycle data, indicating that the integration of game elements into physical education learning stimulated active participation and improved mastery of basic techniques.

Despite the significant improvement in performance, the results in Cycle I fell short of the previously established success indicator of 80%. Based on observations and

reflections at the end of the cycle, it was found that most students still had trouble synchronizing their arm swing with the ball release. This lack of motor coordination resulted in suboptimal serve accuracy across the class. Therefore, it is necessary to strengthen the intensity of the game and modify more specific coordination exercises in the next cycle to ensure that all technical aspects can be mastered more thoroughly and meet the expected completion standards.

Table 2.

No	Assessment Indicators	Cycle I Results	Improvement from Pre-Cycle	Success Status
1	Average Class Grade	71.31	+7.67 Points	Not Yet Reached Target
2	Number of Students Passing	10 Students	+7 Students	-
3	Classical Completion Percentage	45%	+31%	Not Completed (<80%)
4	Percentage of Incomplete Students	55%	-	-
5	Target Success Indicators	80%	-	-

Cycle II Results

Entering Cycle II, researchers made strategic improvements by reorganizing group management and placing special emphasis on synchronizing arm swing techniques. The primary focus was on analogizing the throwing motion in the game Boy-boyan to help students internalize the mechanics of the underhand serve more naturally. Through increased game intensity and more structured technical guidance, motor coordination barriers encountered in the previous cycle were successfully overcome. This approach proved effective in building student confidence, as the integration of competitive aspects into traditional games stimulated a greater focus on accuracy and fundamental volleyball techniques.

Evaluation results at the end of Cycle II showed a significant increase in performance, with an average class score of 86.65. Quantitatively, the classical completion rate jumped dramatically to 95%, with 21 students successfully exceeding the minimum completion criteria. Only one student failed to achieve this standard due to attendance issues during data collection. With a success rate of 95%, which exponentially exceeds the classical success indicator set at 80%, this classroom action research was declared successful and achieved its goal of improving underhand service skills through a traditional game approach.

Table 1. Improvement of Students' Underhand Serve Skills Across Cycles

Research Stage	Average Score	Mastery Percentage
Pre-Cycle	63.64	14%
Cycle I	71.31	45%
Cycle II	86.65	95%

The data presented in Table 1 shows a consistent and significant improvement in students' volleyball underhand serve skills after the implementation of the Boy-boyan game approach in each cycle of classroom action research. This transformation in learning outcomes is not only quantitative but also reflects the effectiveness of the game-based learning model in the context of physical education.

This significant improvement occurs through a transfer of learning mechanism, where there are similarities in basic movement patterns between traditional games and formal sports techniques. In Boy-boyan, students intuitively swing their arms from the ground up to throw the ball toward a target pile of stones. The kinematics of this movement are identical to the arm swing mechanics of a volleyball underhand serve. The motor adaptation process is accelerated because students use their familiar muscle memory from the game context to apply it to more specific technical skills.

Furthermore, the integration of this traditional game successfully transformed the previously monotonous and rigid learning atmosphere into a more competitive and enjoyable one. This intervention addresses students' psychological aspects: the relaxed yet challenging playing atmosphere has been shown to effectively reduce students' anxiety when contacting the ball. This positive psychological state directly impacts improved hand-eye coordination.



Figure 1. Learning Process Using the Boy-Boy Game Approach

This image illustrates the dynamics of physical education learning activities for fifth-grade students through the implementation of the traditional Boy-boyan game approach. The visualization shows students actively participating in the mechanics of throwing a ball directed at a stack of wooden blocks, an activity that kinetically adopts the basic principles of the underhand serve technique in volleyball. Through this game-based instructional design, students intuitively practice synchronized arm swings, body balance stability, and hand-eye coordination. This activity is systematically designed to strengthen directional control of the ball, which is crucial for achieving optimal serve accuracy.

The implementation of a game-based learning environment has been proven to create an inclusive, collaborative, and enjoyable instructional atmosphere. The fun element of

the Boy-boyan game significantly increases students' intrinsic motivation and self-confidence when practicing complex motor skills. Furthermore, the integration of local wisdom into the physical education curriculum provides meaningful and contextual learning experiences for students. This approach not only facilitates effective technical competence in the underhand serve but also supports the development of students' affective and social aspects through intensive interaction throughout the learning process.

Discussion

The results of this study indicate that the implementation of the traditional Boy-boyan game approach had a positive and significant impact on improving volleyball underhand serve skills in fifth-grade students at Elementary School 189 Inpres Cambajawa. The gradual, patterned transformation of students' abilities—from a very low level in the pre-cycle (average 63.64; 14% completion rate) to a very high level of success in Cycle II (average 86.65; 95% completion rate)—demonstrates the effectiveness of the play-based learning strategy in the context of elementary school physical education.

In terms of movement mechanics, the ball-throwing activity in Boy-boyan has similar kinetic components to the underhand serve technique, including arm swing coordination, postural stability, balance, and ball direction control. The significant 31% improvement in Cycle I indicates that students are beginning to internalise these movement patterns more effectively through a fun context compared to conventional drill methods. This aligns with the theory of motor skill acquisition, which states that meaningful and contextual learning experiences can accelerate mastery of complex techniques (Orangi et al., 2025; Renshaw et al., 2010; Suzuki, 2024).

Increased motivation and active participation also drove this improvement in learning outcomes, in addition to technical aspects. Reduced anxiety about technical errors was replaced by enthusiasm for play, which directly impacted student self-efficacy. Achieving a 95% completion rate at the end of Cycle II confirms that when psychological barriers are minimised through play, students' motoric potential can develop optimally. This finding is consistent with previous literature emphasising that enjoyment and intrinsic motivation are key predictors of successful physical education learning (Berki & Tarjányi, 2022; Carcamo-Oyarzun et al., 2025; de Bruijn et al., 2023).

Furthermore, the integration of the Boy-boyan game excelled not only in the physical dimension but also in preserving local cultural values and developing social skills. During the intervention, students demonstrated improved cooperation, communication, and sportsmanship. These findings offer empirical evidence that the utilisation of local wisdom as an instructional medium can foster a comprehensive learning ecosystem (Rasidi & Istiningsih, 2025; Sadri & Temaja, 2025). Thus, the boy-boyan game approach has proved to be a relevant and effective pedagogical strategy for achieving volleyball competency standards at the elementary school level (Khulafa, 2018; Kogoya et al., 2023).

This research makes a significant contribution to several aspects of physical education development, particularly at the elementary school level. It strengthens the theory that traditional game-based learning is effective in accelerating the acquisition of gross motor skills. The results provide empirical evidence that the movement mechanics of local games can align kinetically with the techniques used in formal sports, such as volleyball. It provides new scientific references for integrating the traditional Boy-Boyan game into modern physical education curricula while supporting the theory of contextual and meaningful learning. It offers an alternative solution for elementary school physical education teachers to address students' low interest and technical skills through inclusive and low-cost methods.

Furthermore, it contributes to efforts to revitalise local culture through formal education, ensuring that traditional games remain relevant and familiar to the younger generation. Furthermore, this research presents systematic steps for improving learning through Classroom Action Research (CAR), starting from identifying barriers to motor synchronisation in Cycle I to optimising it in Cycle II. This study can serve as a reference for similar research in other sports. Overall, this research bridges the gap between competitive sports and traditional games, proving that a pedagogical approach rooted in local culture can produce competitive and holistic learning outcomes.

4. CONCLUSION

The implementation of the traditional Boy-boyan game approach significantly improved the underhand serve skills in volleyball among fifth-grade students at Elementary School 189 Inpres Cambajawa. The improvement was evidenced by the increase in the average grade point average, from 63.64 in the pre-cycle to 71.31 in Cycle I, and reaching a peak of 86.65 in Cycle II. A dramatic transformation in learning completion occurred, from an initial level of only 14% (3 students) to 95% (21 students) at the end of Cycle II. This achievement exceeded the classical success indicator of 80%. Furthermore, the improvement in students' motor skills was driven by the alignment of the movement mechanics between the Boy-boyan throw, a traditional throwing technique, and the underhand serve, a basic volleyball serve. Furthermore, the enjoyable learning environment successfully reduced psychological barriers, thereby increasing students' motivation and confidence in accurately executing basic volleyball techniques.

As a recommendation, teachers are advised to be more creative and innovative in integrating various traditional games into formal sports materials. This approach can be used as an alternative solution to minimize student boredom with conventional training methods (drills), which tend to be monotonous. Schools are expected to support the use of local wisdom as a learning medium by providing supporting facilities and infrastructure, as well as encouraging the development of a curriculum at the educational unit level based on the preservation of regional culture. It is recommended that other researchers conduct further studies on the use of different traditional games (such as Kasti or Egrang) to improve motor skills in other sports or conduct research with a broader subject to strengthen the generalizability of these findings.

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