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A Modified Game Approach to Improving the Learning Outcomes of Students in Physical Education Volleyball Instruction

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ABSTRACT
This study aims to improve students' learning outcomes on the underhand serve technique in volleyball through a modified game approach in physical education (PE) classes at SMP Negeri 47 Surabaya. The main issue addressed is the low motivation and skill level of students in performing the underhand serve, caused by the lack of variation in teaching methods and the use of inappropriate equipment. This classroom action research (CAR) was conducted in two cycles involving 30 eighth-grade students from class VIII A. The modification applied involved using plastic balls instead of standard volleyballs to make it easier for students to master the underhand serve technique. Data were collected through tests, observation, and documentation, and analyzed using descriptive quantitative methods. The results showed a significant improvement in students' learning outcomes, with mastery learning increasing from 73.31% in cycle I to 93.34% in cycle II. The use of modified games proved effective in increasing students' motivation, participation, and skills in learning the underhand serve in volleyball. Therefore, the modified game approach can serve as an innovative solution to improve learning outcomes in PE, particularly in volleyball material

Keywords: Learning Outcomes, Modified Games, Volleyball, Underhand Serve.

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INTRODUCTION

Physical Education encompasses a range of physical activities designed to improve overall fitness and well-being. It includes essential components such as health enhancement, physical fitness, emotional stability, and social competence (Putra, A., et al., 2024). According to Putri (2024), school-based learning plays a critical role in helping students develop their full potential by acquiring knowledge, fostering positive attitudes, and enhancing life skills, thereby supporting the achievement of educational goals. Unlike theoretical subjects, PJOK (Physical Education, Sports, and Health) requires students to engage in direct physical activities, equipping them with both the knowledge and practical skills necessary to improve their learning outcomes (Mahfud, et al.).

Volleyball is one of the most widely taught and popular sports in PJOK classes. It not only develops students' motor skills but also cultivates teamwork and enhances physical fitness (Nasuka, 2019). Among its fundamental techniques, the underhand serve is essential as the initial action to start gameplay. However, students often encounter challenges in mastering this technique, primarily due to unsuitable equipment and low learning motivation (Maulidin & Adawiyah, 2020). The modified game approach serves as an effective instructional alternative by adapting rules, equipment, or gameplay structures to align with students' developmental characteristics (Putra, 2021). Modifications such as adjusting court size, net height, ball weight, or the number of players can enhance engagement and participation (Arif Rakhman, 2011). One practical modification involves using plastic balls instead of standard volleyballs for underhand serve practice, providing a safer, lighter option that helps students perform the technique with increased confidence and reduced anxiety.

Findings from Classroom Action Research (CAR) by Maulidin and Adawiyah (2020) demonstrated that modified games in volleyball instruction significantly improved students' underhand passing skills. These findings are supported by Putra (2021), who emphasized that game modifications can effectively enhance both learning outcomes and student motivation in PJOK classes. Therefore, implementing modified games using plastic balls for underhand serve instruction is expected to optimize learning outcomes. Such approaches are essential in fostering a positive, motivating, and student-centered learning environment that encourages active participation and skill mastery (Ernalita, 2017).

Field observations at SMP Negeri 47 Surabaya indicate that PJOK instruction—particularly in volleyball—has yet to be implemented optimally. The absence of engaging game-based learning strategies has led to reduced student enthusiasm. Only a minority of students actively participate in volleyball lessons, while the majority remain passive and disengaged. This lack of engagement negatively affects the classroom climate and diminishes motivation, resulting in boredom and reduced involvement during physical activities. Despite the school's adequate facilities and infrastructure, there remains a need for pedagogical strategies that promote student participation. One promising approach is the use of modified volleyball games with plastic balls to assess their impact on students' learning motivation. Based on this rationale, the present study aims to improve students' learning outcomes through a modified game approach in PJOK, specifically by incorporating plastic balls in teaching the underhand serve technique.

METHOD

This study employed a Classroom Action Research (CAR) design with a quantitative

approach, aiming to improve students' skills in performing the underhand volleyball serve through a series of structured interventions. The research was conducted in two cycles, where each cycle consisted of four essential stages: planning, implementation, observation, and reflection. These cycles were designed to systematically address the problems identified during the initial observation, allowing the researcher to apply appropriate actions and assess their effectiveness based on quantifiable learning outcomes. The study was carried out at SMP Negeri 47 Surabaya, located at Jl. Lempung Perdana V No. 1–3, Lontar, Sambi Kerep, Surabaya 60216. The first cycle was implemented on Tuesday, April 9, 2025, followed by the second cycle on Tuesday, April 15, 2025.

The participants in this research were 30 students from class VIII A in the 2024/2025 academic year, consisting of 17 male students and 13 female students. The focus of the study was to measure the extent to which the use of modified plastic balls in volleyball instruction could enhance the students' ability to execute underhand serves. To evaluate this improvement, a variety of data collection instruments were utilized. These included performance tests designed to assess students' technical execution of the underhand serve, structured observation sheets used to monitor student activity and engagement during the lessons, and documentation methods such as photographs and field notes to support the analysis of the learning process. Although observations were used, the emphasis remained on collecting numerical data to assess changes in achievement across cycles.

The analysis in this study was carried out quantitatively using descriptive statistical methods. Specifically, the researchers calculated percentages and mean scores to determine changes in students' learning outcomes from the initial observation to the end of Cycle II. This quantitative data helped establish whether the learning actions implemented were effective in enhancing student performance. The statistical analysis also facilitated the identification of trends and patterns in learning improvements, particularly in terms of mastery level and performance category distributions. While observational data were used to enrich the interpretation of results, no qualitative data analysis was conducted. Therefore, this study remains within the framework of a quantitative classroom action research model, focused on numerical evidence to validate the effectiveness of instructional modifications.

RESULTS AND DISCUSSION

RESULTS

Before starting the research in Cycle I, the researcher conducted observations and requested the learning outcome data of Class VIII A students at SMP Negeri 47 Surabaya from

the Physical Education teacher. This data was used as baseline information to determine the students' initial ability level in performing the underhand serve in Physical Education lessons for Class VIII A at SMP Negeri 47 Surabaya.

Table 1. Initial Observation Results Before Action

No.	Score Range	Criteria	Description	Frequency	Percentage
1	90 – 100	Competent	Very Good	2	6.66%
2	80 - 89	Competent	Good	5	16.66%
3	70 – 79	Competent	Fair	15	49.99%
4	60 – 69	Not Competent	Poor	5	16.66%
5	<60	Not Competent	Very Poor	3	9.99%
		Jumlah		30	100%

Based on Table 1 above, the initial observation results showed that the learning achievement of Class VIII A students at SMP Negeri 47 Surabaya indicated that 6.66% of students (2 students) scored between 90–100, categorized as "Competent." Students with scores of 80–89, also categorized as "Competent", totaled 5 students, or 16.66%. Meanwhile, 15 students (49.99%) scored between 70–79, also within the "Competent" category. Students who scored between 60–69, categorized as "Not Competent", totaled 5 students (16.66%). Lastly, 3 students (9.99%) scored below 60, also categorized as "Not Competent".

Table 2. Cycle I Learning Outcome Scores

No.	Score Range	Criteria	Description	Frequency	Percentage
1	90 – 100	Competent	Very Good	4	13.33%
2	80 - 89	Competent	Good	9	30.00%
3	70 – 79	Competent	Fair	15	49.99%
4	60 – 69	Not Competent	Poor	2	9.99%
5	<60	Not Competent	Very Poor	0	0.00%
		Jumlah		30	100%

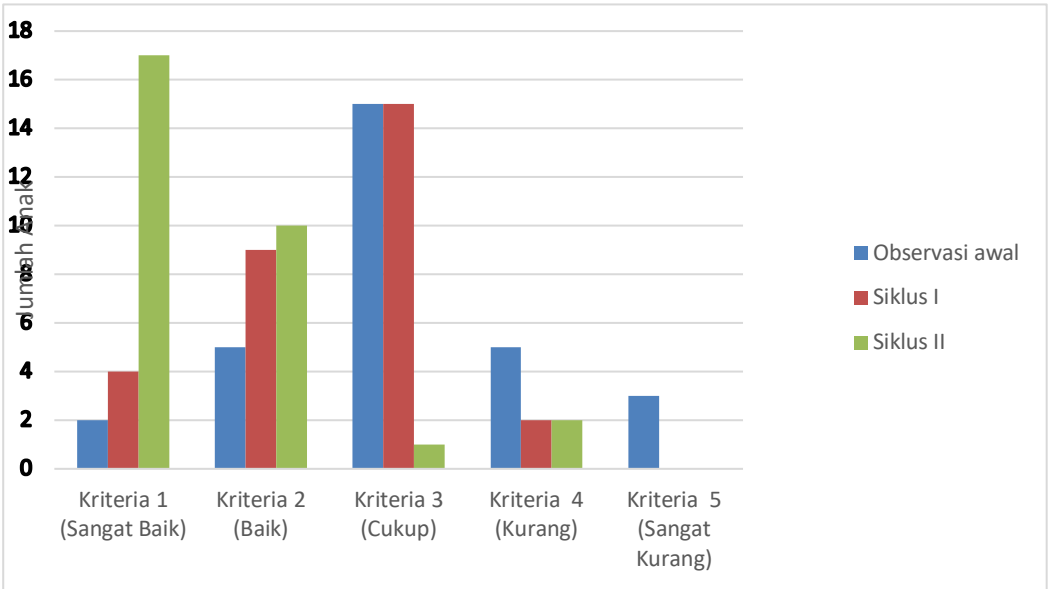
In Table 2 above, the data from Cycle I shows that the learning outcomes of the underhand serve volleyball game using modified plastic balls for Class VIII A students at SMP Negeri 47 Surabaya indicated that 13.33% of students (4 students) scored between 90-100, categorized as "Competent" with the description "Very Good." Students with scores between 80-89, categorized as "Competent" and described as "Good," totaled 9 students (30.00%). Additionally, 15 students (49.99%) scored between 70-79, categorized as "Competent" with the description "Satisfactory." There were 2 students (9.99%) with scores between 60-69, categorized as "Not Competent" with the description "Poor." No students scored below 60, categorized as "Not Competent".

Table 3. Cycle II Learning Outcome Scores

No.	Score Range	Criteria	Description	Frequency	Percentage
1	90 – 100	Competent	Very Good	17	56.66%
2	80 - 89	Competent	Good	10	33.33%
3	70 – 79	Competent	Fair	1	3.33%
4	60 – 69	Not Competent	Poor	2	6.66%
5	<60	Not Competent	Very Poor	0	0.00%
		Jumlah		30	100%

Based on Table 3 above, a descriptive summary of the learning outcomes of the basic underhand serve technique in Cycle II using modified plastic balls for Class VIII A students at SMP Negeri 47 Surabaya in the 2024/2025 academic year is obtained. After the actions taken in Cycle II, the learning success rate showed improvement, with the percentage of completion reaching 93.34%. A total of 28 students were declared "Competent," and only 2 students (6.66%) had not yet achieved competence, with scores ranging from 60-69. To describe it more clearly, there were 17 students (56.66%) in the "Very Good" category with scores between 90-100, 10 students (33.33%) in the "Good" category with scores between 80-89, and 1 student (3.33%) in the "Satisfactory" category with scores between 70-79. Overall, the descriptive results in Cycle II showed an improvement in student learning outcomes in the basic underhand serve technique using modified plastic balls in line with the target set before the research was conducted. Research by Hayati & Hidayat (2023) also revealed that the adaptation and implementation of modified volleyball games had a significant impact on students' learning motivation, which subsequently affected the improvement in learning outcomes.

Comparison of Actions: Pre-Action Observation, Cycle I, and Cycle II.



This data shows a significant improvement in both the achievement of student learning outcomes after the implementation of underhand volleyball serve learning using modified balls.

DISCUSSION

Based on the results of this study regarding the effect of using a modified plastic ball in underhand volleyball serve games on improving students' learning outcomes in volleyball serve techniques in class VIII at SMP Negeri 47 Surabaya, it was found that modifying the ball can help improve students' underhand serve skills. The study used the Classroom Action Research (CAR) method, with each cycle consisting of four main activities: planning, implementation, observation, and reflection.

The research conducted at SMP Negeri 47 Surabaya with class VIII students showed a skill improvement of 66.67% in cycle II. The use of a lighter plastic ball as a replacement for the rubber ball in underhand serve learning provided a simpler alternative tool. During the implementation of the learning process with modified volleyball games, the teacher played an important role in creating a supportive atmosphere to foster positive interactions between the teacher and students. A comfortable learning environment, both inside the classroom and on the field, provided space for students to be more active and confident in following the lessons. The positive interaction among students also contributed. This approach can serve as a solution to various challenges faced by teachers in increasing student participation during the learning process. Research by Atmoko, B & Hidayat, T. (2024) also revealed that students became more active in learning activities because the modified rubber ball, now a plastic ball, became lighter, making students feel less afraid of getting hurt when hitting the ball or performing the underhand serve in the volleyball game. In the context of this study, students showed high enthusiasm and excitement for the treatment given, namely the use of plastic balls as a modified learning tool. This condition directly impacted the improvement of learning outcomes, particularly in underhand serve skills in volleyball. With increased self-confidence and a conducive learning atmosphere, students were able to achieve more optimal learning results.

CONCLUSION

The classroom action research conducted at SMP Negeri 47 Surabaya showed that the modified game approach using plastic balls in teaching underhand volleyball serve techniques effectively improved student learning outcomes. The modification of the tool, in the form of a lighter and easier-to-control plastic ball, proved to enhance motivation, active participation, and students' skills in performing underhand serves. This was evident from the significant

improvement in student learning outcomes from cycle I to cycle II, where the percentage of student completion reached 93.34% in cycle II, up from 73.31% in the previous cycle. The use of plastic balls as a replacement for standard volleyballs reduced students' fear of performing the serve, making them more willing to try and improve their underhand serve technique. Additionally, the conducive learning atmosphere and positive interaction between teachers and students played a key role in the success of the learning process. The application of modified games also helped overcome various challenges faced by teachers in increasing student participation during the learning process, such as a lack of interest and motivation in volleyball material. Therefore, the application of modified games with plastic balls can be an innovative strategy to effectively improve learning outcomes and student interest in PJOK learning, especially in volleyball material. This approach not only enhances students' underhand serve skills but also builds self-confidence, increases active participation, and creates a more enjoyable and meaningful learning environment for students. This study supports previous research findings showing that the modification of volleyball games can have a positive impact on student learning motivation and outcomes.

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