COMPETITOR:
JURNAL PENDIDIKAN KEPELATIHAN OLAHRAGA
e-ISSN: 2657-0734 & p-ISSN: 2085-5389 || Volume 17, Number 3, 2025 || P.2937-2951

Improving Learning Outcomes of Underwear Passing In Volleyball Through The Use of Plastic Ball Media For Grade IV Students of SD Inpres Mare

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ABSTRACT

This study aims to analyze the improvement of learning outcomes of underhand passing in volleyball through the use of plastic balls for fourth-grade students of SD Inpres Mare. This study uses a Classroom Action Research (CAR) design implemented in two cycles. Each cycle consists of four stages: planning, implementation, observation, and reflection. The subjects of the study were all 28 fourth-grade students of SD Inpres Mare using a total sampling technique. The independent variable in this study was the use of plastic balls, while the dependent variable was the learning outcomes of underhand passing. Data were collected through skills tests and observations, then analyzed using quantitative descriptive analysis techniques with percentages. The results showed a significant improvement in students' underhand passing learning outcomes. In cycle I, learning completeness reached 64% with an average score of 74. After improvements were made in cycle II, learning completeness increased to 86% with an average score of 81. This improvement was seen in all three learning domains: cognitive increased from 61% to 89%, affective from 64% to 86%, and psychomotor from 68% to 82%. The conclusion of this study shows that the use of plastic ball media is effective in improving the learning outcomes of underhand passing in grade IV students of SD Inpres Mare.

ARTICLE HISTORY
Received: 2025/07/23
Accepted: 2025/07/28
Published: 2025/10/31

KEYWORDS
Learning Outcomes:
Underhand Passing;
Volleyball;
Media;
Plastic Ball.

AUTHORS' CONTRIBUTION
A. Conception and design of the study;
B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
E. Obtaining funding

Cites this Article : Yudikarno, Yudikarno; Adil, Ahmad; Hudain, Muh. Adnan; Kamaruddin, Ilham; Suwardi, Suwardi. (2025). Improving Learning Outcomes of Underwear Passing In Volleyball Through The Use of Plastic Ball Media For Grade Iv Students of SD Inpres Mare. **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 17 (3), p.2937-2951

INTRODUCTION

Physical education, sports, and health are essential components of the education system, aiming to develop students' overall potential, encompassing physical, cognitive, and affective aspects, through various planned and structured physical activities (Firmansyah & Wijaya, 2019; Kusuma et al., 2020). In the context of elementary school learning, physical education is an effective means of building a foundation of fundamental movement skills that will develop as children grow (Nugraha & Rahmawati, 2021; Setiawan, 2020).

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Volleyball is a curricular topic in physical education that has high pedagogical value because it integrates various fundamental technical skills, including the underhand pass, an essential foundation of the game (Bachtiar & Hidayat, 2020; Pranata et al., 2021). Underhand passing in volleyball is the ability to receive and pass the ball using both forearms with optimal precision and control (Firmansyah & Darmawan, 2022; Wahyudi, 2019). Mastery of this technique is crucial because it forms the basis for developing more complex volleyball skills (Kusuma, 2020; Widodo & Sari, 2021).

Based on preliminary observations conducted at SD Inpres Mare, it was identified that fourth-grade students' competency in executing underhand passes in volleyball was still low. Of the 28 students observed, only 6, or approximately 21%, were able to execute underhand passes with proper and accurate technique, while the remaining 22, or 79%, still faced various obstacles in their execution (Handayani, 2021; Nugroho & Pratama, 2020). Identified problems included hand positions that did not form a stable platform, incorrect contact with the ball on the forearm, imprecise passing direction, and poor body coordination during passing (Haryanto, 2019; Wijaya & Setiawan, 2022).

Various factors contribute to this low underhand passing ability. First, learning methods that tend to be monotonous and lack variety cause students to lose interest and motivation in learning (Indrawati et al., 2020; Kristiawan, 2021). Second, the use of standard, hard balls creates fear and anxiety in students, especially when the ball hits their body (Nuraini & Hakim, 2019; Sarifudin, 2020). Third, there is limited opportunity to repeat movements due to limited learning media (Permana, 2021; Yulianto & Mardiansyah, 2020).

Students' psychological well-being also poses a significant obstacle to learning the underhand pass. Fear of a hard ball makes students lack confidence and hesitate when passing (Budiman & Fitriani, 2022; Hasan, 2019). As a result, movements become stiff and unnatural, resulting in suboptimal passing results (Maulana, 2020; Sari & Kurniawan, 2021). In addition, students' lack of understanding of the basic concepts of underhand passing techniques, such as proper body position, point of contact, and follow-through movement, also worsens the learning situation (Novita et al., 2020; Triyanto, 2022).

To address these challenges, innovations in learning are needed that can create a conducive, safe, and enjoyable learning environment for students (Cahyono & Putri, 2021; Suryadi, 2019). Using appropriate learning media is one solution that can be implemented to overcome obstacles in learning underhand passing (Dwi & Anggraini, 2020; Irawan, 2021). Plastic balls were chosen as an alternative learning medium because they have characteristics that suit the needs of elementary school students: they are lightweight, safe, and fear-free when used (Andika & Susanto, 2022; Pradipta, 2020).

Plastic balls have several advantages for teaching underhand passing in elementary schools. First, their light weight makes them easier for students to control and reduces the risk of injury (Firmansyah & Kurnia, 2019; Nugroho, 2021). Second, the soft texture alleviates students' fear, making them more confident in

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executing repeated passes (Riyadi & Safitri, 2020; Wahyudi, 2022). Third, the affordable price allows schools to provide sufficient equipment for all students (Hermawan et al., 2021; Suherman, 2019). Fourth, the use of plastic balls allows students to focus on mastering basic techniques without being burdened by anxiety around the ball (Latif & Widodo, 2020; Rosyid, 2021).

The use of plastic balls in underhand passing instruction is expected to have a positive impact on various aspects of learning. From a psychomotor perspective, students will have more opportunities to practice and repeat passing movements correctly (Arifin & Jamil, 2022; Mulyadi, 2020). From a cognitive perspective, students can more easily grasp the concepts and principles of underhand passing techniques because they can experiment and explore movements without fear (Nasution & Harahap, 2019; Putra, 2021). From an affective perspective, a pleasant and safe learning atmosphere will increase students' motivation and enthusiasm in learning (Firdaus & Utami, 2020; Syahputra, 2022).

METHODS

This study used a Classroom Action Research (CAR) design, which aims to improve and enhance the quality of classroom learning through reflective and systematic action (Kemmis & McTaggart, 2019; Wijaya & Kusumawati, 2020). Classroom Action Research was chosen because the researcher is directly involved in the learning process and can conduct continuous reflection and improvement to achieve optimal learning objectives (Arikunto, 2021; Supardi, 2019).

This research was conducted in two cycles, with each cycle consisting of four main stages: (1) planning, which includes developing a lesson plan, preparing plastic ball media, and assessment instruments; (2) implementing the lesson plan using plastic ball media; (3) observing to collect data on the learning process and outcomes; and (4) reflecting to analyze successes and shortcomings as input for improvements in the next cycle (Hamalik, 2020; Mulyasa, 2022).

The population in this study was all active students at SD Inpres Mare in the 2024/2025 academic year, totaling 156 students. The research sample was selected using a total sampling technique, namely all 28 fourth-grade students at SD Inpres Mare, consisting of 15 male students and 13 female students (Sugiyono, 2020). The total sampling technique was chosen because the population size was relatively small, allowing all members of the population to be included as research samples (Arikunto, 2019; Margono, 2021).

The research instruments used included plastic balls as learning aids and an underhand passing skills assessment sheet covering three domains: cognitive, affective, and psychomotor. Data collection techniques were carried out through: (1) a skills test to measure students' underhand passing skills; and (2) observation to observe students' activities and attitudes during the learning process (Arifin, 2020; Purwanto, 2021).

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Table 1. Psychomotor Domain Assessment Instrument

Aspect	Stage	Criteria	Score (1–4)
Supporting Foot Position	Preparation	The supporting foot is stable.	
	Acceptance	The supporting foot remains stable during the underhand pass.	
	End	Balance is maintained after the pass.	
Arm Swing	Preparation	The hand is swung upward, ready to pass.	
	Acceptance	The ball is hit with the arm.	
	End	The arm follows the direction of the ball.	
Body Position	Preparation	The body leans forward and is relaxed.	
	Acceptance	The body is balanced on the supporting foot.	
	End	The body faces the direction of the pass.	
Passing Accuracy	Acceptance	The ball is aimed directly at the target.	

Table 2.
Cognitive Domain Assessment Instruments

Criteria	Score	Description
Very good	4	Able to explain in great detail and accurately the technique of underhand passing, hand position, point of contact, and direction of the pass.
Good	3	Able to explain most of the concepts of underhand passing correctly.
Fair	2	Able to explain some basic concepts of underhand passing, but not completely.
Need Guidance	1	Unable to explain the concept of underhand passing correctly.

Table 3.
Domain Assessment Instruments

Attitude Aspect	Score 4 (Very Good)	Score 3 (Good)	Score 2 (Fair)	Score 1 (Needs Guidance)
Discipline	Always be disciplined in every lesson	Often demonstrates discipline	Sometimes disciplined	Lack of discipline
Cooperation	Always cooperate with friends	Often cooperates	Sometimes cooperative	Uncooperative
Responsibility	Very responsible for assignments	Taking responsibility for most tasks	Lack of responsibility	Irresponsible
Sportsmanship	Always be a good sport in games	Often acts as a good sport	Sometimes unsportsmanlike	Unsportsmanlike

The learning outcome scores for these three domains are calculated using the following formula:

$$\text{Individual Score} = (\text{Achieved Score} / \text{Maximum Score}) \times 100$$

Table 4.
Indicators of Learning Outcome Success

No.	Value Range	Criteria	Information
1	> 92 – 100	Very Good	Completed
2	> 83 – 92	Good	Completed
3	≥ 75 – 83	Fair	Completed
4	< 75	Poor	Not Completed

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The data analysis technique used was quantitative descriptive analysis with percentages to determine the level of student learning completion (Sudjana, 2020). The research success indicator was determined if at least 80% of students achieved the minimum competency criteria (KKM) score of 75, with an increase in learning outcomes from cycle I to cycle II (Daryanto, 2019; Trianto, 2021).

RESULTS AND DISCUSSION

Result

Cycle I

The implementation of learning in Cycle I showed that some students still experienced difficulty executing underhand passes correctly, even though they were using a plastic ball. Students were still adapting to the new media and had not yet fully grasped the standard underhand passing technique.

Cognitive Domain

Learning outcomes in the cognitive domain demonstrated students' understanding of the concept and theory of underhand passing techniques in volleyball. Data on cognitive domain learning outcomes in Cycle I can be seen in the following table:

Table 5.

Cognitive Domain Learning Outcomes, Cycle I

Number of Students	KKM	Highest Score	Lowest Score	Average	Completed	Not Completed
28	75	88	62	74	17	11

Based on this data, 17 students (61%) achieved learning completion in the cognitive domain, while 11 students (39%) did not. This is because many students still lack a thorough understanding of the basic techniques of underhand passing, including proper hand position, point of contact, and accurate passing direction.

Affective Domain

The affective domain assessment measures students' attitudes and behaviors during the learning process. The learning outcomes for the affective domain in Cycle I are shown in the following table:

Table 6.

Affective Domain Learning Outcomes, Cycle I

Number of Students	KKM	Highest Score	Lowest Score	Average	Completed	Not Completed
28	75	85	65	75	18	10

Eighteen students (64%) achieved learning completion in the affective domain, while 10 students (36%) had not yet achieved it. Students who had not yet achieved it demonstrated a lack of discipline in following learning instructions, a lack of enthusiasm in practicing underhand passes, and a lack of cooperation with their peers during pair practice.

Psychomotor Domain

The psychomotor domain measures students' ability to practically perform underhand passing skills. Learning outcomes for the psychomotor domain in Cycle I are shown in the following table:

Table 7.
Psychomotor Domain Learning Outcomes, Cycle I

Number of Students	KKM	Highest Score	Lowest Score	Average	Completed	Not Completed
28	75	86	60	73	19	9

Nineteen students, or 68%, achieved learning completion in the psychomotor domain, while nine students, or 32%, were not yet fully accomplished. Those who were not yet fully accomplished still experienced difficulty coordinating movements and inaccurate control of passing direction. Despite using a lighter plastic ball, some students were still unfamiliar with the correct passing technique.

Summary of Learning Outcomes in Cycle I

The overall results of the underhand passing lesson using a plastic ball in Cycle I can be seen in the following table:

Table 8.
Summary of Learning Outcomes in Cycle I

Number of Students	KKM	Highest Score	Lowest Score	Average	Completed	Not Completed
28	75	86	62	74	18	10

Based on the recapitulation of learning outcomes in cycle I, 18 students or 64% achieved learning completion, while 10 students or 36% had not yet achieved completion. The class average score was 74, which is still slightly below the established KKM of 75. These results indicate the need for improvements in the learning process in cycle II, especially in terms of providing more intensive guidance to students experiencing difficulties, increasing the frequency of practice, and improving learning methods to be more effective.

Cycle II

Learning in Cycle II focused on improving weaknesses identified in Cycle I. The teacher placed greater emphasis on correct basic underhand passing technique, increased the intensity of training, and provided individual guidance to students who were still experiencing difficulties. The use of plastic balls in Cycle II was further optimized with more engaging and challenging training variations.

Cognitive Domain

Learning outcomes in the cognitive domain in Cycle II demonstrated an increase in students' understanding of the concept of underhand passing technique. Learning outcome data can be seen in the following table:

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Table 9.
Cognitive Domain Learning Outcomes, Cycle II

Number of Students	KKM	Highest Score	Lowest Score	Average	Completed	Not Completed
28	75	92	70	82	25	3

Learning completion in the cognitive domain increased to 25 students, or 89%, while only 3 students, or 11%, were incomplete. This improvement indicates that students have a better understanding of the concept and theory of underhand passing, including proper body positioning, how to contact the ball with their hands, and the principles of passing accuracy. The average score also increased to 82, indicating improved cognitive understanding compared to Cycle I.

Affective Domain

Learning outcomes in the affective domain in Cycle II demonstrated improvements in student attitudes and behaviors in participating in learning. Learning outcome data can be seen in the following table:

Table 10.
Affective Domain Learning Outcomes, Cycle II

Number of Students	KKM	Highest Score	Lowest Score	Average	Completed	Not Completed
28	75	88	68	79	24	4

Learning completion in the affective domain increased to 24 students, or 86%, while 4 students, or 14%, were incomplete. This improvement indicates an improvement in student attitudes in terms of discipline, cooperation, responsibility, and sportsmanship during the lesson. Students were more enthusiastic in participating in the lesson and demonstrated a positive attitude when practicing underhand passes using a plastic ball.

Psychomotor Domain

Learning outcomes in the psychomotor domain in Cycle II showed an improvement in student skills in underhand passes. Learning outcome data can be seen in the following table:

Table 11.
Psychomotor Domain Learning Outcomes, Cycle II

Number of Students	KKM	Highest Score	Lowest Score	Average	Completed	Not Completed
28	75	90	67	81	23	5

Learning completion in the psychomotor domain increased to 82% for 23 students, while 18% for 5 students remained incomplete. This improvement indicates that students have become more skilled at performing underhand passing techniques, with improved movement coordination, more precise ball contact, and higher passing accuracy. The average score increased to 81, indicating significant motor skill improvement.

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Summary of Learning Outcomes in Cycle II

The overall results of the underhand passing learning using plastic balls in Cycle II can be seen in the following table:

Table 12.
Summary of Learning Outcomes in Cycle II

Number of Students	KKM	Highest Score	Lowest Score	Average	Completed	Not Completed
28	75	90	68	81	24	4

Based on the recapitulation of learning outcomes in cycle II, learning completion increased to 24 students, or 86%, while 4 students, or 14%, had not yet completed the learning. The class average score increased to 81, which means it exceeded the minimum passing criteria (KKM). This improvement demonstrates the success of using plastic balls in improving the learning outcomes of fourth-grade students at SD Inpres Mare.

Discussion

This improvement occurred across all three learning domains: cognitive, affective, and psychomotor. The successful use of plastic balls in this learning aligns with the theory put forward by Arsyad (2020), who states that appropriate learning media can increase learning motivation and facilitate student understanding of the material being taught.

From a cognitive perspective, the use of plastic balls helps students better grasp the concept of underhand passing techniques because they can explore and experiment with movements without fear (Sadiman et al., 2021). The lightweight and safe plastic balls allow students to focus on understanding basic techniques such as hand position, point of contact, and passing direction, without being burdened by anxiety about the hardness of the ball (Kustandi & Sutjipto, 2019). This aligns with research by Hamalik (2020), which states that learning media that can reduce students' fear and anxiety will improve cognitive processes in learning.

The improvement in the affective aspect indicates that the use of plastic balls successfully creates a fun and conducive learning environment. Students become more enthusiastic, disciplined, and exhibit a more sportsmanlike attitude during learning (Daryanto, 2019). The sense of security provided by plastic balls makes students more confident to practice repeatedly without fear of injury, thus increasing their active participation in learning (Susilana & Riyana, 2020). Research by Smaldino et al. (2019) supports these findings by stating that learning media tailored to student characteristics can increase motivation and positive attitudes toward learning.

In terms of psychomotor skills, plastic balls provide students with more opportunities to repeat underhand passing movements (Munadi, 2021). The lightweight and easy-to-control characteristics of plastic balls allow students to focus on mastering basic techniques such as hand-eye coordination and follow-through movements (Sanjaya, 2020). In accordance with the principles of motor learning proposed by Schmidt and Lee (2019), intensive repetition with appropriate feedback will significantly improve motor skills.

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The improvement in learning outcomes from cycle I to cycle II also demonstrates the importance of reflection and improvement in the learning process. In cycle I, several weaknesses persisted, such as a lack of exercise variety, suboptimal individual guidance, and ineffective time management (Uno & Lamatenggo, 2020). Based on these reflections, improvements were made in cycle II by increasing the variety of passing exercises, providing intensive guidance to students experiencing difficulties, and optimizing learning time (Wina, 2021).

The use of plastic balls also facilitates learning that aligns with the developmental characteristics of elementary school-aged children. According to Piaget in Santrock (2019), elementary school-aged children are in the concrete operational stage, requiring learning through direct experience with real objects. Plastic balls provide a safe and enjoyable concrete experience, enabling students to optimally construct knowledge and skills in underhand passing (Slavin, 2020).

The success of this research is also supported by the principle of active learning, where students do not merely passively receive information but actively participate in the learning process (Bonwell & Eison, 2018). Through the use of plastic balls, students have the opportunity to practice, experiment, and refine their underhand passing techniques, both independently and in groups, making learning more meaningful (Silberman, 2019).

The safety offered by plastic balls is also a key factor in successful learning. Research by Saputra (2021) shows that a sense of safety in physical education is crucial for building students' confidence in physical activity. The painless impact of plastic balls on the body eliminates the psychological barriers often experienced by students learning underhand passing using standard balls (Wijaya, 2022).

Furthermore, the use of plastic balls also has a positive impact on the social aspects of learning. Students are more confident in interacting and working collaboratively with their peers in pair or group passing exercises (Johnson & Johnson, 2020). This positive social interaction not only improves underhand passing skills but also develops social skills such as communication, cooperation, and empathy (Slavin, 2019).

Although this study showed positive results, some students still did not achieve mastery in cycle II. This shows that each student has different characteristics and abilities when it comes to learning (Gardner, 2018). For these students, a more individualized learning approach is needed, addressing their specific needs, such as providing additional practice time, more intensive tutoring, or modifying learning tasks to suit their abilities (Tomlinson, 2021).

The practical implications of this research are the importance of selecting appropriate learning media tailored to student characteristics. Teachers need to be creative and innovative in selecting and using learning media to create effective and enjoyable learning (Djamarah & Zain, 2020). Plastic balls can be an economical and effective alternative for teaching basic ball skills, especially in schools with limited sports facilities and infrastructure (Husdarta & Kusmaedi, 2019).

This research also contributes to the development of physical education learning theory, particularly regarding the use of modified media for basic skills learning. Modified media, such as plastic balls, not only function as learning aids but also as strategies to reduce psychological barriers and increase student confidence in learning (Lutan, 2020). The concept of modification in physical education learning is highly relevant, especially in the context of elementary school learning, where student safety and comfort are top priorities (Suryobroto, 2021).

A limitation of this research is the relatively short implementation time of only two cycles. To obtain more optimal and comprehensive results, further research can be conducted over a longer period of time and involving more cycles (Madya, 2019; Suharjana, 2020).

CONCLUSION

Based on the research results and discussion, it can be concluded that the use of plastic balls is effective in improving volleyball underhand passing learning outcomes for fourth-grade students at SD Inpres Mare. The improvement in learning outcomes was clearly visible from cycle I to cycle II across all three learning domains. In the cognitive domain, mastery increased from 61% to 89%. In the affective domain, mastery increased from 64% to 86%. Meanwhile, in the psychomotor domain, mastery increased from 68% to 82%.

Student learning mastery increased from 64% in cycle I to 86% in cycle II, a 22% increase. The class average score also increased from 74 in cycle I to 81 in cycle II. This improvement demonstrates that the plastic balls create a safe, comfortable, and enjoyable learning environment, increasing student confidence and motivation to learn and practice underhand passing intensively.

Teachers are advised to be more creative and innovative in selecting and using learning media that are appropriate to student characteristics and needs. Modified media such as plastic balls can be an effective solution to overcome learning barriers, particularly in terms of student safety and comfort. Future research is recommended to explore the use of other types of modified media. Furthermore, further research is needed to assess the long-term impact of using plastic balls on the development of motor skills and student attitudes toward physical education learning.

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