



Modified Balls and Soccer Passing Skills among Extracurricular Students at SD Negeri 091317 Pematang Raya

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Abstract

Objectives:

In general, this study aims to examine the effect of ball modification on soccer passing skills.

Materials and Methods:

The method employed in this study is the experimental research method. The research instrument used is a test measuring passing technique skills in soccer. The study population consists of all students actively participating in soccer instruction at MI Nurul Falah Rawa Mekar Jaya, totaling 15 students. The sample for this study comprises the same group of 15 students actively participating in soccer instruction at MI Nurul Falah Rawa Mekar Jaya. A total sampling technique was used for sample selection.

Results:

Based on the research findings, calculations, and analysis of measurement data, it can be concluded that the use of a modified ball has a significant effect on soccer passing skills at MI Nurul Falah Rawa Mekar Jaya, as the calculated t-value is greater than the t-table value ($8.83 > 1.76$).

Conclusions:

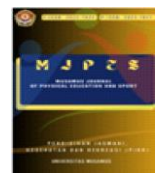
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Keywords: Ball Manipulation, Passing, Soccer

Introduction

Football is one of the most popular sports in the world, including in Indonesia. In the context of formal education at the elementary school level, football is introduced as part of Physical Education, Sports, and Health (PJOK) with the aim of developing motor skills, teamwork, and sportsmanship from an early age. Basic football techniques such as dribbling, passing, shooting, and ball control are competencies that students need to master in order to participate effectively in the game. Among these basic techniques, passing plays a crucial role because it serves as the foundation for developing effective playing patterns, maintaining ball possession, and creating opportunities to score goals. Good passing technique reflects a player's ability to read the game, maintain motor balance, and coordinate eye and foot movements, all of which are important aspects of developing football skills among elementary school children.

However, in practice, teaching basic football techniques in elementary schools often faces various challenges that affect student learning outcomes. One of the most common problems is students' low ability to perform football passing accurately and effectively. This condition is caused by several factors, including less varied teaching methods, low student motivation during practice, and the use of playing equipment, such as standard footballs, that may not be appropriate for children's physical capacity and motor development. Several studies have stated that the success of sports learning is strongly influenced by the suitability of learning media and equipment to students' characteristics. Therefore, appropriate equipment can help students understand basic sports techniques more quickly and effectively (Ruri, 2020).



In this context, modifying playing equipment is one relevant pedagogical strategy for addressing problems in football learning, particularly in teaching passing skills. Equipment modification basically involves adjusting the characteristics of equipment, such as its size, weight, shape, or material, to better suit students' developmental needs. In elementary school football learning, a modified ball may be smaller, lighter, or have a different texture, making it easier for students who are still developing their basic motor skills to control. This concept is consistent with previous research showing that modifying equipment and games in physical education can create learning activities that are safer, more enjoyable, and more effective, while also increasing students' active participation in the learning process (Balwant Singh, 2024).

Previous studies related to the implementation of modified games in football learning have shown positive effects. For example, a study conducted by Mallaena et al. found that the implementation of modified football games significantly improved students' basic football passing skills, as indicated by an increase in learning mastery. These findings provide initial evidence that game modifications, including ball modifications, can contribute significantly to improving basic football skills.

In addition to technical skills, the use of modified balls in football learning has also been reported to increase students' motivation and active participation in the learning process. Sudirman (2024), in his study, found that the use of smaller, lighter, and softer modified footballs significantly increased students' learning motivation and engagement during PJOK lessons compared with the use of standard footballs. This modification made learning more interesting and better suited to the physical capacities of elementary school students (Sudirman, 2024).

Actual conditions in the field indicate that the use of standard footballs in elementary school football lessons is often difficult for students to control because the size and weight of the ball are not always appropriate for their physical abilities. As a result, students experience difficulties in performing accurate passes, which ultimately affects their learning outcomes in this skill. This problem not only hinders students' mastery of football techniques but may also reduce their interest in physical education because of less enjoyable learning experiences. Therefore, the use of modified balls is an innovative approach that deserves further investigation to determine how such equipment affects students' passing skills.

Ball modification in the context of football learning is not merely a change in the physical characteristics of the equipment but also represents a pedagogical innovation that adapts the learning environment to students' needs and characteristics. Effective physical education should reflect the principles of differentiated instruction, in which teachers adapt equipment, tasks, or learning contexts to match students' learning abilities. Thus, equipment modification, particularly the use of modified footballs, can be viewed as a strategic effort to create an inclusive learning environment that supports the optimal development of basic football skills.

Furthermore, several other studies have shown that equipment modification in sports learning can help students master basic skills more quickly and accurately. Although some of these studies have focused on other sports, such as volleyball and basketball, the principle of modifying equipment according to students' developmental stages remains relevant to football learning. For example, a study examining the use of modified plastic balls in teaching basketball passing found that the use of modified balls significantly improved students' passing learning outcomes (Yohanes, 2025). The same principle can be applied to football to determine the extent to which ball modification can help students master passing techniques more effectively.

In addition to technical skills and student engagement, ball modification also has implications for the psychological and social aspects of learning. When students use



equipment that is appropriate for their abilities, it can increase their confidence and comfort during practice and game activities. Increased self-confidence can contribute to higher intrinsic motivation, encouraging students to continue practicing and actively participating in physical education activities. Therefore, equipment modification can help create a more inclusive learning environment and provide greater opportunities for all students to succeed in football learning.

However, despite this positive potential, there is still a limitation in empirical research specifically examining the effect of ball modification on football passing skills among elementary school students, particularly in local contexts such as SD Negeri 091317 Pematang Raya. Some existing studies are still limited in scale or descriptive in nature, and therefore do not provide a comprehensive picture of the impact of ball modification on football passing skills among students in specific elementary schools. Therefore, this study is designed to address this research gap by examining more deeply the relationship between the use of modified balls and improvements in students' football passing skills at SD Negeri 091317 Pematang Raya.

This research is important because it can provide strong empirical evidence regarding the effectiveness of using modified balls in football learning among elementary school students. The findings are expected to serve as a reference for PJOK teachers in developing football learning strategies that are more innovative and appropriate to students' characteristics. Furthermore, the findings may provide practical recommendations for other schools facing similar challenges in improving students' basic football skills.

In addition, this research can contribute to the development of sports education, particularly in the use of modified learning equipment. With empirical evidence regarding the positive effects of ball modification on passing skills, PJOK teachers may consider using modified footballs more broadly as part of technical football learning strategies. This approach can also contribute to creating a learning environment that is more effective, enjoyable, and participatory for all students.

Materials and Methods

Study Design

The experimental research method is used to determine the effect of a specific treatment on another factor under controlled conditions. It is a method for identifying cause-and-effect (causal) relationships between two factors—deliberately introduced by the researcher while eliminating, minimizing, or excluding confounding variables. Thus, this method is employed to reveal whether or not there is an effect from the variables selected for the study.

Study Participants

The sampling method employed was total sampling. Total sampling is a technique in which the entire population serves as the sample; this means the sample comprised the total population specifically, all 15 students actively participating in soccer training at SD Negeri 091317 Pematang Raya.

Study Organization

1) Type of Instrument

The instrument used in this study is a test. The test administered is a formative assessment designed to measure passing technique skills in the game of soccer.

2) Conceptual Definition

The conceptual definition in this study pertains to passing technique skills specifically, an individual's ability to execute the sequence of movements involved in passing during a soccer match. The objective of the passing technique is to ensure the ball reaches the intended teammate accurately.



3) Operational Definition

To enable empirical research, the concept must be operationalized by converting it into a variable an element that holds a measurable value. A passing technique skills test is used to assess the students' proficiency in executing passes.

Statistical Analysis

To process the data obtained from the aforementioned soccer passing skill test, the data is first processed and then analyzed using statistical techniques. Statistics play a crucial role in researc both in model formulation and data analysis so the data derived from the measurements is processed using statistical formulas.

Results

The first step taken by the author was to describe the data obtained. Once the data had been collected, the author calculated the mean and standard deviation. The results of these calculations are presented in the following table:

Table 1. Calculated Mean and Standard Deviation of Soccer Passing Skills Under the Influence of Ball Modification

TEST PERIOD	AVERAGE	SIMPANGAN BAKU
Pre-test	31.07	4.74
Post-test	44.20	4.39

Once the mean values and standard deviations for each variable have been calculated, the next step is to conduct a normality test using the Lilliefors test a non-parametric approach. Before calculating the values required for the Lilliefors test, a hypothesis must be established.

In this instance, the null hypothesis is defined as follows: ball modification has no effect on soccer passing skills at SD Negeri 091317 Pematang Raya.

The data must be derived from a normally distributed sample. To accept or reject the null hypothesis, the calculated L-value (Lo) is compared against the critical L-value obtained from the Lilliefors test table.

Table 2. Normality Test Calculation Results for Pre-test and Post-test Soccer Passing Skills Involving Ball Modification

Testing Period	Lo Count	L List 0.05: 15	Results
Initial Test	0.074	0.220	Normal
Final Test	0.095	0.220	Normal

Based on Table 4.2 above, it can be stated that the calculated Lo values were 0.074 for the pre-test and 0.095 for the post-test; the calculations reveal that these values are lower than the L-table value of 0.173. Therefore, it can be concluded that the pre-test and post-test data are normally distributed.

Discussion

A rubber ball is a common tool or medium used in teaching soccer. In this instance, the author modified the equipment by using a rubber ball, tailoring the modification to the students' abilities to facilitate their learning process. This aligns with the views of Bahagia and Suherman, who explain that the essence of modification lies in analyzing and developing lesson material by breaking it down into learning activities that can effectively



support student learning. The findings indicate that, based on the calculations from the pre-test and post-test on soccer passing skills, the use of the modified ball had a significant and substantial impact, with the calculated t-value exceeding the t-table value ($8.83 > 1.76$).

Conclusions

Based on the research findings, calculations, and analysis of measurement data, it can be concluded that ball modification has a significant influence on soccer passing skills at SD Negeri 091317 Pematang Raya.

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Conflict of Interest

The authors declare no conflict of interest.

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