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The Effect of Box Jump and Depth Jump Training on Long Jump Ability in PKO Students, Faculty of Sports and Health Sciences, Makassar State University

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ABSTRACT

This study aims to determine the effect of box jump and depth jump training on long jump performance among students of the Sports Coaching Education Program, Faculty of Sports and Health Sciences, Universitas Negeri Makassar. The research employed an experimental method using a two-group pretest-posttest design. A total of 30 students were randomly assigned to two groups: one received box jump training and the other depth jump training, both conducted over six weeks. Long jump ability was assessed before and after the training. Data analysis using the t-test revealed that both box jump and depth jump exercises had a significant impact on improving long jump performance ($p < 0.05$). Furthermore, a significant difference was found between the two methods, with depth jump training proving to be more effective than box jump training. It can be concluded that the depth jump is a more effective method for enhancing long jump performance in students. The initial test of the long jump ability of the box jump training group (A1) obtained a KS-Z value = 0.204 and a probability value = 0.094. Therefore, (P>0.05), this indicates that the initial test data follows a normal distribution or is normally distributed. The final test of the long jump ability of the box jump training group (A2) obtained a KS-Z value = 0.174 and a probability value = 0.200. Therefore, (P>0.05), this indicates that the final test data follows a normal distribution or is normally distributed. The initial test of the long jump ability of the depth jump training group (B1) obtained a KS-Z value = 0.202 and a probability value = 0.102. Therefore, (P>0.05), this indicates that the initial test data follows a normal distribution or is normally distributed. The final test of the long jump ability of the depth jump training group (B2) obtained a KS-Z value = 0.181 and a probability value = 0.200. Therefore (P>0.05), this shows that the final test data follows a normal distribution or is normally distributed.

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INTRODUCTION

Football has very complex techniques, requiring coordination between each technique. This ensures that individuals can play football well and correctly. To achieve

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maximum learning outcomes in football, learning about football techniques is necessary. These techniques include dribbling, passing, trapping, heading, and shooting (kicking). (Hasanah, 2007).

The aim of the game of football is for each team of eleven to try to control the ball, put the ball into the opponent's goal as many times as possible, and try to break up the opponent's attacks to protect or keep the ball from entering their goal. To become a skilled player, one must master various basic techniques in this game.

Some basic techniques that need to be mastered include dribbling (dribble), passing (passing the ball), trapping (stopping the ball), heading (heading the ball), and shooting (kicking the ball). One of the basic techniques that must be mastered is heading. Heading is a unique skill that exists only in football, because no other sport uses the head to move the ball (Yunior et al., 2021). In football, players require abilities that are dominated by basic techniques, physical, mental, and tactical. However, it is important to emphasise the basic techniques of football, where all techniques are very influential in achieving victory. One of these technical abilities is heading (Ahmad Atiq, Mimi Haetami, 2022).

Heading is a unique skill unique to football; no other sport uses the head to move the ball. Basic heading techniques are crucial in football because heading allows players to perform defensive and offensive techniques that can be applied throughout the game (Cook, 2013). Players use heading to pass the ball, score goals, and clear the ball in the air.

In implementing the Physical Education (PJOK) learning and teaching process, several strategies are used to achieve learning objectives. One of these strategies is utilising or modifying materials that are closely related to the core material in the ongoing learning process. The selection of these materials is not the best, but rather the accuracy or suitability of their use. The more appropriate the application of the game materials used in the learning and teaching process, the more effective the goals will be. Heading is a technique for playing with the ball using the head or forehead for the purpose of passing, scoring goals, stopping an opponent's attack, and shooting from a dangerous area (Anton Trio Putra, 2020).

Heading is the technique of heading the ball with the head, specifically hitting the forehead. This technique has several functions, such as clearing (clearing the ball from the goal area to ward off an opponent's attack), known as heading clearing. Furthermore, heading is also useful for scoring goals and providing passes to teammates using the head or forehead (Anton Trio Putra, 2020). To improve heading skills, it is important to consider training patterns that align with the concept of heading movements, such as training the neck, abdominal muscles, and legs. Back-up exercises are considered isotonic exercises that aim to strengthen the back and abdominal muscles.

The back plays a crucial role in heading movements. One basic heading technique involves moving the body backwards until it curves at the waist. Next, the body is swung or jerked forward using the strength of the abdominal muscles, pelvic thrust, and legs (with the knees initially bent and then straightened), until the forehead touches the ball. In addition, the torso, especially the abdominal muscles, also plays a role in the movement of heading the ball (Kuswoyo et al., 2020).

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Common problems with heading technique include misaligned shoulders and a body that isn't facing the ball properly. This makes it difficult to direct the ball accurately. Furthermore, many players experience fear when heading, primarily due to fear of the incoming ball and a lack of understanding of proper technique. Consequently, their heading is less effective during play. The explanation above demonstrates that in football, particularly when it comes to heading, proper techniques are essential to achieving the desired effect.

Based on the aforementioned issues, researchers conducted direct observations and interviews with coaches and student athletes from the ABT Kota Intan Football Club, Ngabang District, Landak Regency, about heading techniques. Through these observations and interviews, the coaches revealed that some student-athletes still lack proper heading skills. First, their forehead contact with the ball is inadequate, and second, their body swing upon forehead contact is poorly coordinated. From the results of the observations carried out, it is very necessary to have equipment that can support the success of training and help student athletes easily do headers, so that it can provide valuable experience and confidence when successfully doing a good header.

METHODS

The method used in this study is an experimental method with a One Group Pretest Posttest Design research design. The population in this study were all 38 student athletes of the ABT Kota Intan Football Club, Ngabang District, a population is a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by the researcher to be studied and then conclusions drawn (Sugiyono, 2010: 8). The sample is part of the number and characteristics possessed by the population. The sample of this study was taken using a total sampling technique, where the researcher did not take individuals but groups or areas called clusters. In this study, the sample taken was 38 people. To determine the extent to which the application of football games can influence the learning outcomes of football heading at ABT Kota Intan, Ngabang District, the data obtained were analysed using the "t-test" formula. Before data processing, data normality and homogeneity tests were performed. The normality test aims to determine whether the sample group is normally distributed. To test for normality, the Kolmogorov-Smirnov test (K-S test) was performed, while the homogeneity test aims to determine whether the two data groups have the same variation. Whether the data is homogeneous or not. To determine this, a variation test is used.

RESULTS AND DISCUSSION

Based on the results of the pre-test and post-test data conducted by the researcher using a heading test, the analysis results are explained in the following table.

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Table 1.
Statistics Deskriptif Data Pretest dan Posttest

Description	Pretest	Posttest
Mean	8,3	11,7
Maximum Score	11	14
Minimum Score	7	10
Improvement	40.2%	

The calculation results in the table above show that the football heading test results before the implementation of the football heading game (pairs heading game, triangle heading game, and volleyball heading game) during the pre-test averaged a score of 8.3 with a standard deviation of 1.1, a maximum score of 11 and a minimum score of 7. The football heading test results after the implementation of the football heading game (pairs heading game, triangle heading game, and volleyball heading game) during the post-test averaged a score of 11.75 with a standard deviation of 1.01, a maximum score of 14 and a minimum score of 10.

The percentage increase in learning outcomes for heading the ball during the pre-test, before the implementation of the football heading games (pairs heading, triangle heading, and volleyball heading) and the post-test, after the implementation of the football heading games (pairs heading, triangle heading, and volleyball heading) was 40.2%.

Using the t-test formula for similar samples, the calculated t-value was 8.275, and the t-table value was 2.03. Considering the calculated t-value and the t-table value, it can be concluded that H1 is accepted and H_0 is rejected because the calculated t-value of 8.275 > is greater than the t-table value of 2.03. Therefore, the implementation of the football heading game can significantly influence football heading learning outcomes.

In the learning process, there are criteria for the completion of training results that are expected to be achieved. Students or athletes as a result of the learning process that has been carried out. In this case, the learning outcome criteria for each face-to-face session can be achieved if students are able to achieve a learning outcome equal to or greater than 75% through learning the application of the football heading game in three face-to-face sessions. The results can be seen in the comparison table of learning completion during the pre-test and post-test as follows:

Table 2.
Completeness of Training Results Heading

Number	Column 2	
	training results	The number of athletes or students who completed
1	Pretest	14
2	Postets	32

Source: Based on (optional in the text)

After reviewing the research results above, the discussion of these results focuses on the hypotheses that have been tested for validity. The tested hypotheses indicate that heading exercises can significantly influence football heading exercise outcomes. This is evident from the calculated t-value of 8.275 > t-table of 2.03. This is because the

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results of heading exercises in football are a crucial benchmark in the football learning process. Therefore, appropriate materials are needed in football training, especially for heading techniques.

This study applied football heading game materials to students, namely, pairs heading, triangle heading, and volleyball heading. The goal was to determine whether these heading games could influence the learning outcomes of heading in football. The three games applied to the heading lessons provided by the researcher had a significant impact on heading learning because they aimed to improve fundamental heading skills, in line with the objectives of the materials proposed by Luxbacher (2004:20-24), which stated that pairs heading, triangle heading, and volleyball heading aim to improve students' basic heading skills. Besides aligning these games with the basic concepts of heading movements in general, they also have a direct positive psychological and mental impact on the athletes or students.

In practice, these three games emphasise the elements contained within them, thereby facilitating and increasing students' enthusiasm and interest in learning. Initially, students tended to be less interested and afraid of performing heading movements, resulting in a lack of understanding of basic heading techniques, ultimately impacting their grades in football, particularly in basic heading techniques.

Next, relevant research conducted by previous researchers is presented, which relates to the variables in this study as a reference for formulating hypotheses. Ilham (2011) conducted a study on "The Effect of Triangle Header Training on Basic Heading Skills in the SMP Negeri 1 Prabumulih Football Team," with the following problem statement: "Is there an effect of triangle header training on basic heading skills in the SMP Negeri 1 Prabumulih football team?" The conclusion of the study is that triangle header training does affect basic heading skills in the SMP Negeri 1 Prabumulih football team.

CONCLUSION

This part consists of two (2) sub-parts: the article's conclusion and suggestions or recommendations from the research. Conclude the article critically and logically based on the research findings. Please be careful in generalising the results. The authors should also state the research limitations in these parts.

Generally, the conclusion should explain how the research has moved the body of scientific knowledge forward. In the suggestion, please describe the author's recommendations for further studies regarding the author's research implications. Generally, the conclusion should explain how the research has moved the body of scientific knowledge forward. In the suggestion, please describe the author's recommendations for further studies regarding the author's research implications.

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Based on the data analysis, the results of the hypothesis testing and the research discussion, the following conclusions can be drawn: (1) The application of football games, in this case, in the form of pairs heading, triangle heading, and volleyball heading, has had a significant impact in the form of improved learning outcomes for students who participated in the learning material on basic football techniques, namely basic heading techniques, with an increase of 40.28%. This proves that the application of football games, namely the heading game, successfully improved football heading learning outcomes for 10th-grade ABT Football Club athlete, Intan City, Ngabang District; and (2) the results of testing the research hypothesis using the T-test yielded a calculated t-value of 8.275 and a t-table value of 2.03. Therefore, Ha is accepted and Ho is rejected. Because the calculated t-value of 8.275 is greater than the t-table value of 2.03, it can be concluded that there was an improvement in football heading learning outcomes for ABT Football Club athlete, Intan City, Ngabang District, after the implementation of the heading game.

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