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Article

Enhancing Passing Accuracy in Youth Soccer Players Through Paired Passing Drills

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Abstract

Passing accuracy is a fundamental skill in soccer, enabling teams to maintain possession, create offensive plays, and control the game's tempo. However, young athletes often struggle with passing precision due to monotonous training methods and limited exposure to varied drills. This study aims to examine the effects of paired passing variation training on the passing accuracy of soccer players aged 10–12 years at Siborong-Borong United Soccer School. The study employed an experimental design using pre-test and post-test assessments to measure passing ability before and after a four-week intervention. The total population of 14 athletes was used as the research sample through total sampling. Data collection was conducted using a standardized soccer skill assessment test, and statistical analysis was performed using paired sample t-tests. The results revealed a significant improvement in passing accuracy following the intervention. The mean passing score increased from 8.07 (pre-test) to 13.57 (post-test), with a mean difference of 5.64 points, demonstrating a statistically significant enhancement ($t = 7.05$, $p < 0.05$). These findings indicate that structured paired passing drills effectively improve passing accuracy by reinforcing muscle memory, ball control, and decision-making under match-like conditions. This study contributes to sports training methodologies by emphasizing the importance of interactive and varied training approaches for young soccer players. Future research should explore the long-term retention of passing skills and the integration of tactical decision-making exercises to maximize skill transferability in competitive matches.

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INTRODUCTION

Soccer is one of the most popular sports globally, played by individuals across various age groups and social backgrounds. The game requires not only physical stamina but also tactical intelligence and mastery of fundamental techniques (Burgos Angulo et al., 2024; Duncan, Clarke, Bolt, Eyre, & Roscoe, 2022). Among these, passing is a crucial skill, enabling teams to maintain possession, create offensive plays, and generate scoring opportunities (Rein, Raabe, & Memmert, 2017). Effective passing allows teams to control the flow of the game while minimizing the risk of losing possession (Merlin, Pinto, Moura, Torres, & Cunha, 2024). As a result, enhancing the accuracy and precision of passing is an essential component of soccer training programs, especially for young athletes (Marsuna, Rusli, & Saman, 2024).

However, preliminary observations of athletes aged 10–12 years at Soccer School of Siborong-Borong United revealed deficiencies in their passing skills. Low passing accuracy remains a significant challenge, stemming from several factors such as insufficient training frequency, monotonous training methods, and limited variation in drills provided by coaches. Traditional passing exercises often lack diversity and fail to challenge young players adequately, resulting in decreased motivation and suboptimal skill development (Papastaikoudis, Collins, & Collins, 2024). Consequently, many players struggle with executing accurate passes, frequently missing targets or having their passes intercepted by opponents.

Numerous studies have demonstrated that incorporating diverse training methods can significantly enhance the technical skills of young players. For instance, Panji et al. (2024) found that paired passing drills effectively improved ground passing accuracy among soccer players aged 10–12 years. Similarly, Saputra et al. (2022) reported a significant improvement in passing skills following the implementation of paired passing drills. Furthermore, Rumaropen et al. (2025) highlighted the positive impact of training variations on passing accuracy in female futsal players. These drills are specifically designed to improve accuracy, ball control, and decision-making abilities in match-like scenarios. By adopting such methods, players are expected to enhance their passing skills and foster better teamwork on the field.

This study aims to evaluate the effects of paired passing variations on the passing skills of soccer athletes aged 10–12 years at Siborong-Borong United. The primary hypothesis posits that incorporating paired passing variations will result in a significant improvement in passing accuracy and efficiency compared to traditional

training methods. This hypothesis is supported by previous research, which indicates that dynamic and interactive training variations facilitate motor adaptation and accelerate the learning process for fundamental soccer skills. For example, Doewes et al. (2020) demonstrated that small-sided games effectively enhanced basic soccer skills such as dribbling and passing in players aged 10–12 years. Additionally, Rein et al. (2017) developed innovative metrics to assess passing effectiveness in elite soccer, providing valuable insights for designing more impactful training programs.

The significance of this study extends beyond its academic implications and offers practical applications for soccer training. Academically, it contributes to the growing body of literature on sports coaching, particularly regarding the efficacy of training methods in improving passing skills among young players. Practically, the findings can serve as a reference for coaches, trainers, and sports scientists in designing more engaging and effective training programs tailored to the developmental needs of young athletes. Thus, this study not only advances theoretical perspectives in sports coaching but also delivers actionable insights for the effective development of youth soccer programs.

METHODS

Research Design

This study employed an experimental method using the Kemmis and Taggart design to examine the effect of paired passing variation training on the passing ability of 10–12-year-old soccer athletes at Siborong-Borong United Soccer School. The experimental design allowed researchers to observe changes in passing ability before and after the intervention by comparing pre-test and post-test results. This approach provided an objective evaluation of the effectiveness of paired passing variation training in enhancing athletes' passing skills. The study was conducted at Siborong-Borong United Soccer School, located on Jalan Siliwangi, Siborong-Borong District, North Tapanuli Regency, North Sumatra Province, Indonesia. This location was chosen because Siborong-Borong United is an active soccer school dedicated to youth athlete development. The research was carried out over four weeks, from July 31 to August 26, 2023. During this period, training sessions were held four times per week (Monday, Tuesday, Thursday, and Saturday) from 4 PM until completion.

Population and Sample

The population of this study consisted of all 14 soccer athletes at Siborong-Borong United Soccer School, aged 10 to 12 years. Given the limited population size, this study used total sampling, in which the entire population was included as the research sample. This technique was chosen to ensure that all subjects received identical treatment, making the study findings more representative in evaluating the effect of paired passing variation training on passing ability. Total sampling is frequently applied in research with small populations to enhance the external validity of the results (Sugiyono, 2017).

Data Collection and Measurement Instrument

The data collection process in this study involved administering both a pre-test and post-test to evaluate the passing ability of athletes before and after the intervention. The same measurement instrument was used for both assessments, namely the soccer skill assessment test developed by Ardi Nusri (2018). This test (Figure 1) specifically measures passing ability using a rebound board measuring 4.5 meters × 1 meter, which is divided into five target sections. The scoring system is based on passing accuracy, where the center section is assigned 3 points, the left and right sections are 2 points, and the outermost sections are 1 point, while any passes that miss the target receive 0 points. This instrument has been validated and proven reliable, ensuring its effectiveness in accurately assessing passing skills in youth soccer training. The structured nature of this test allows for objective and consistent measurement of an athlete's performance, minimizing subjectivity in the assessment process (Nusri, 2018).

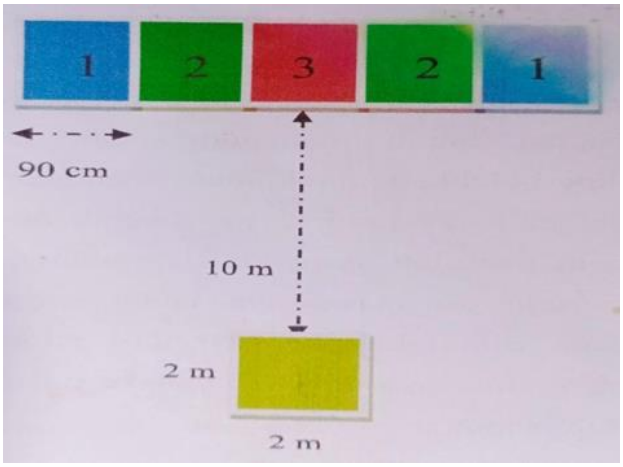

Fig. 1. Soccer Passing Skills Test Form (Nusri, 2018)

Intervention Procedure

The training program implemented in this study consisted of paired passing variation drills designed to improve various aspects of passing, including accuracy, speed, and ball control. The intervention was conducted over a period of four weeks, with training sessions held four times per week (Monday, Tuesday, Thursday, and Saturday). Each session lasted 90 minutes, divided into three phases: a 15-minute warm-up, 60 minutes of technical passing drills, and a 15-minute cool-down. The training program incorporated five different passing variations, each targeting specific technical and tactical components of passing ability. During the training sessions, coaches and researchers closely monitored the execution of passing techniques to ensure proper form and mechanics. Immediate feedback was provided to athletes who demonstrated errors, allowing for real-time adjustments and skill refinement. The systematic repetition of passing exercises was intended to reinforce muscle memory and enhance precision in passing under different conditions. The training sessions were structured to progressively increase in difficulty, ensuring that athletes developed a comprehensive understanding of passing mechanics and improved their ability to execute passes under varying levels of pressure.

Data Analysis

The collected data were analyzed using statistical techniques, specifically the t-test, to determine whether the observed differences between the pre-test and post-test scores were statistically significant. The first step in the analysis involved calculating the mean and standard deviation of the pre-test and post-test results. Following this, a normality test using the Liliefors test was conducted to verify whether the data were normally distributed. Additionally, a homogeneity test was performed to confirm the equality of variances across the groups. Once the assumptions of normality and homogeneity were met, a paired sample t-test was used to compare the mean scores from the pre-test and post-test. The t-test is widely used in experimental research to assess the effectiveness of an intervention by comparing two sets of related data (Field, 2013). The following are tests for normality (1), homogeneity (2), and paired samples (3).

$$Z_1 = \frac{X^1 - X}{S} \quad (1)$$

$$\mathrm{f} = \frac{\text{highest varians}}{\text{smallest varians}} \quad (2)$$

$$t = \frac{\bar{B}}{\frac{S_B}{\sqrt{n}}} \quad (3)$$

RESULTS & DISCUSSION

Descriptive Analysis of Data

Based on the pre-test results, the athletes' performance was categorized into different levels. The findings revealed that 2 athletes (14.3%) exhibited a low passing ability, indicating significant difficulties in executing accurate passes, while 12 athletes (85.7%) demonstrated moderate passing skills, suggesting that although they had basic passing abilities, there was still room for improvement.

After completing the four-week training program, a post-test was conducted to determine the changes in passing ability. The results indicated a substantial improvement across all participants. The post-test data showed that 5 athletes (35.7%) attained an excellent level of passing performance, meaning they demonstrated consistent accuracy and precision in their passes. Additionally, 8 athletes (57.1%) improved to a good passing ability level, reflecting a noticeable enhancement in their execution of passes. Meanwhile, 1 athlete (7.1%) remained in the moderate category, suggesting a less pronounced improvement.

Table 1. Results of Research Data Description

Data	Passing Ability		
	Pre-Test	Post Test	Value Difference
Total	113	190	79
Average	8.071429	13.57143	5.642857
Variance	2.37912	4.72527	9.17033
Std. Deviation	1.54244	2.173770	3.028255
Max.	10	17	12
Min.	5	9	1

A detailed statistical analysis (Table 1) was conducted to compare pre-test and post-test performance. The pre-test passing scores ranged between 5 and 10 points, with a calculated mean score of 8.07 and a standard deviation (SD) of 1.54. In contrast, the post-test passing scores ranged between 9 and 17 points, with an increased mean score of 13.57 and a standard deviation of 2.17. The observed improvement in the mean score suggests a significant enhancement in passing ability among the athletes after undergoing the structured paired passing training.

Normality and Homogeneity Tests

To ensure the validity of the statistical analyses, normality and homogeneity tests were conducted before hypothesis testing. The normality test (Table 2) was carried out using the Liliefors test, which assessed whether the pre-test and post-test data followed a normal distribution. The results showed that the pre-test data had an L-count value of 0.0836, while the post-test data had an L-count value of 0.0392. Both values were lower than the L-table value of 0.227, indicating that the data were normally distributed.

Table 2. Results of Normality & Homogeneity Tests

Data	Normality Test		Homogeneity Test	
	L-count	L-table	F-count	F-table
Pre-Test	0.0836	0.227	1.99	2.58
Post Test	0.0392	0.227		

Furthermore, a homogeneity test (Table 2) was performed using an F-test to assess whether the data sets from the pre-test and post-test had equal variances. The computed F-count value was 1.99, which was compared against the F-table value of 2.58 at a significance level (α) of 0.05. Since F-count was lower than F-table, it was confirmed that the variances of the two data sets were homogeneous. These results indicate that the pre-test and post-test data met the necessary statistical assumptions for further analysis.

Hypothesis Testing

To determine whether the paired passing training had a statistically significant impact on the athletes' passing performance, a paired sample t-test was conducted. The test compared the mean differences between the pre-test and post-test results to evaluate the effectiveness of the training intervention. The results of the paired sample t-test showed that the t-count value was 7.05, which was substantially higher than the t-table value of 2.58 at a significance level of α 0.05 and degrees of freedom (df) 13. This statistical outcome indicated that the improvement observed in passing ability was not due to random chance but was a direct result of the training intervention.

Moreover, the mean difference between the pre-test and post-test passing scores was calculated to be 5.64 points, with a standard deviation of 3.03 (Table 1). This increase further supports the conclusion that the structured paired passing training significantly enhanced the athletes' passing accuracy and consistency. The results of this study provide strong empirical evidence that the implementation of

paired passing training has a significant and measurable impact on passing performance among young soccer players aged 10–12 years. The statistical findings confirm that athletes who participated in the structured training program experienced notable improvements in their passing ability, as indicated by their post-test scores.

Discussion

The significant improvement in passing ability observed in this study aligns with previous research on skill-specific training in youth soccer. Several studies have highlighted that systematic and repetitive skill training contributes to the refinement of motor coordination, spatial awareness, and technical execution in young players (Ford, Yates, & Williams, 2010; Williams & Reilly, 2000). Additionally, these findings support the theoretical framework proposed by Schmidt and Lee (2014), which emphasizes the role of deliberate practice in skill acquisition. According to their motor learning theory, frequent and structured training sessions enhance neuromuscular coordination, allowing athletes to execute movements more efficiently and accurately. Given that passing is a fundamental skill in soccer, the structured paired passing training employed in this study appears to have provided an optimal learning environment, reinforcing proper passing mechanics while minimizing common technical errors.

The consistency of our findings with previous research suggests that skill-based interventions, particularly those incorporating partner-based training, play a critical role in improving passing accuracy, control, and decision-making under game conditions. Structured technical drills lead to measurable performance enhancements in youth soccer training (Ali et al., 2007). Despite these positive outcomes, several factors must be considered when interpreting the findings. One potential influencing factor is the variability in players' prior soccer experience, which may have contributed to differences in baseline performance (Egan, Verheul, & Savelsbergh, 2007). While the paired passing training was effective for most participants, individual motivation, cognitive engagement, and previous exposure to structured training may have influenced the rate of skill acquisition (Marsuna et al., 2024). Future research should incorporate qualitative assessments, such as player feedback and coach evaluations, to gain deeper insights into how athletes perceive and respond to training interventions. Additionally, the relatively short duration of this study (four weeks) limits the ability to assess whether these improvements are sustained over time. Longitudinal studies,

spanning multiple months or an entire season, would provide more comprehensive data on the long-term retention and transferability of passing skills acquired through paired passing training.

Another important consideration is the contextual application of the trained passing skills in game situations. While paired passing drills are highly effective for refining technical execution, they do not fully replicate real match dynamics, where players must make split-second decisions under defensive pressure. Previous research by Clemente et al. (2020) suggests that training methods integrating small-sided games and perception-action coupling are more effective in developing both game intelligence and technical proficiency. Therefore, future studies should explore the integration of paired passing training with tactical decision-making drills, incorporating defensive constraints, movement synchronization, and game-based scenarios to maximize skill transfer to competitive settings.

In conclusion, this study provides compelling evidence that structured paired passing training is a highly effective method for improving passing ability among young soccer players. The significant improvements observed in post-test scores highlight the value of targeted training interventions in enhancing technical skills and fostering greater consistency in passing execution. However, to optimize the effectiveness of soccer training programs, future research should incorporate longitudinal analyses, contextualized skill application, and player-specific adaptations. Addressing these dimensions will ensure that skill development is not only technically sound but also adaptable to the unpredictable and dynamic nature of real match conditions.

CONCLUSION

The findings of this study provide strong empirical evidence that structured paired passing variation training significantly enhances the passing ability of young soccer players aged 10–12 years, as demonstrated by the substantial improvement in post-test performance compared to pre-test scores. These results align with previous research emphasizing the importance of incorporating diverse, interactive, and game-like training approaches to optimize motor learning, spatial awareness, and technical execution in youth athletes. The structured drills implemented in this study not only improved passing accuracy but also reinforced consistency and precision, underscoring the effectiveness of deliberate practice in skill acquisition. However,

while the observed improvements were statistically significant, the relatively short duration of this study limits its ability to assess long-term skill retention and transferability to competitive match scenarios. Given the dynamic nature of soccer, future research should explore the integration of passing drills with tactical decision-making exercises under match-like conditions to enhance ecological validity and adaptability. Additionally, individual differences in learning pace, prior playing experience, and cognitive engagement may influence the rate of skill acquisition, necessitating further qualitative investigations into player perception, motivation, and coach feedback to refine training methodologies. The implications of this study extend beyond theoretical contributions, offering practical applications for coaches, sports educators, and trainers in designing evidence-based soccer training programs tailored to the developmental needs of young athletes. By adopting a holistic approach that integrates technical precision with real-game applications, soccer training can be optimized to develop not only proficient passers but also intelligent, adaptable players capable of executing accurate and efficient passing techniques under various levels of match intensity.

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