Available online at : http://journal.unj.ac.id/unj/index.php/gjik
Gladi : Jurnal Ilmu Keolahragaan, 16 (03) 2025, 431-439
Permalink/DOI: https://doi.org/10.21009/GJIK.163.12

THE EFFECTIVENESS OF THE CIRCUIT-BASED FUTSAL LEARNING MODEL ON FUTSAL PASSING AND CONTROL SKILLS

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(Submission Track: Received: 20-03-2025, Final Revision: 01-07-2025, Available Online: 22-08-2025)

Abstract. This study aimed to determine the effectiveness of a circuit-based futsal learning model in improving passing and ball control skills among university students. The research employed a pre-experimental one group pre-test post-test design. The sample consisted of 30 students selected through purposive sampling. The instruments used were a futsal passing test and a ball control test, both validated by experts. The intervention was conducted over [16/weeks], implementing circuit training focused on mastering passing techniques and ball control in game-like situations. Data analysis employed a paired sample t-test with a 0.05 significance level and effect size calculation (Cohen's d). The results indicated an increase in the mean score from 36.57 in the pre-test to 44.93 in the post-test, with a p-value = 0.000 (<0.05) and Cohen's d = 4.58 (very large effect). These findings demonstrate that the circuit-based learning model is highly effective in enhancing fundamental futsal skills, particularly passing and ball control, making it a strong recommendation for application in both academic settings and competitive training environments.

Keywords: Circuit training; Futsal Learning Model; Futsal Passing; Control Skills

INTRODUCTION

Futsal is a team sport that requires endurance and speed (Villarejo García et al. 2025), coordination, and high technical skills (Satria et al. 2024) (Sekulic et al. 2019). In futsal, basic skills such as passing and ball control play an important role in building attacks, maintaining possession of the ball and creating goal-scoring opportunities (Doewes, Elumalai, and Azmi 2022). Accurate passing and effective control allow players to maintain the rhythm of the game, avoid opponents' interceptions, and support attack and defense transitions (Alexander et al. 2024).

The act of passing is complicated because it involves interception of the ball while making a decision, usually under pressure, about which teammate to pass the ball to (Oppici et al. 2017). Current data reports a relatively high number of passes per team: ~647 (~54 actions per player) (Barron, Collins, and Carling 2020). Passing is a way of moving the ball from one place to another which is used to build attacks (Yusuf and Ikadarny 2024).

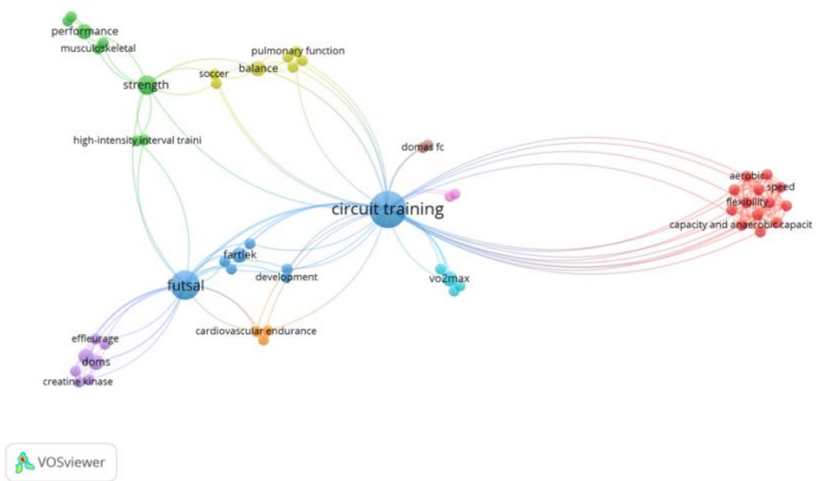
Passing techniques in futsal are needed by each player to start the game, initiate attacks and set the rhythm of the game (Praniata, Kridasuwarso, and Puspitorini 2019). Control techniques must be mastered by every player without exception, whether the player plays as an attacker, defender or goalkeeper. The goal of ball control is to stop the movement of the ball (Rinaldi and Rohaedi 2020).

However, observations in various futsal learning programs show that the majority of players, especially at the physical education student level, still experience limitations in passing consistency and ball control. This can be caused by a less varied training approach and a lack of simulation of real game conditions. One alternative learning approach that is considered effective for improving basic futsal technical skills is circuit training. This method combines various training stations arranged systematically to train physical and technical components sequentially (Zan Mufadillah1) 2022). This circuit training-based basic futsal technique learning model for students provides different learning methods at each post, of course this model will be fun and can provide maximum results (Robiansyah and Amiq 2018).

The circuit training model is a training method that involves a series of different types of exercises at each station/post, carried out sequentially with little or no rest between stations/posts. The Circuit Training-based learning model aims to maximize learning time and ensure that students receive comprehensive training in one learning session.

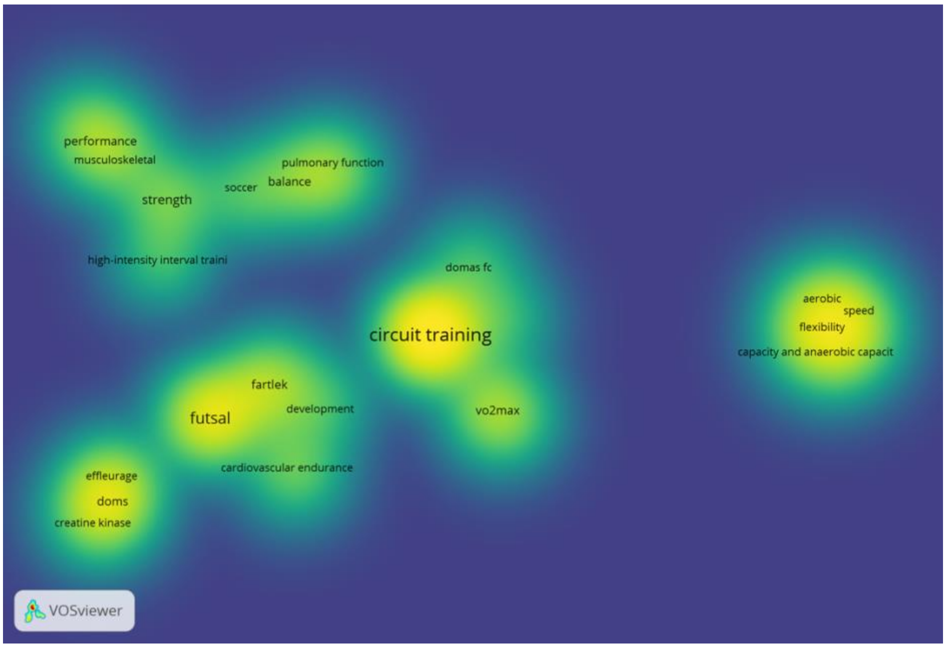
This research will fill the literature with a focus on developing a learning model for basic futsal techniques that suits the needs of physical education students. This learning model will be designed to provide an integrated learning experience, combining theory and practice in the context of futsal teaching. Through this approach, it is hoped that physical education students can gain a deeper understanding of basic futsal techniques and learning strategies, so that they can become more effective instructors in teaching futsal to students at school.

Based on bibliometric analysis to see and understand the distribution, trends, impact and structure of scientific literature and discuss scientific literature with the keywords "circuit" and "futsal" in the 2014-2025 period. Based on a search using the publish or perish application with the Scopus, PubMed and Crossref data banks, 61 articles were obtained. Then articles are selected based on their relationship to keywords. After studying 61 articles, there were 35 articles that were relevant to this research area, while 26 articles were removed from the data bank. Next, a search was carried out using publish or perish with the Scopus data bank with the keywords learning futsal and circuit and obtained articles. After studying 14 articles, there were 13 articles that were appropriate to the research field. The following is an illustration of the distribution of data displayed by the VosViewer application.



Gambar 1.1. Network visualization

Figure 1 shows a visualization of the co-occurrence network which explains the network or relationship between the variables "learning model" and "learning" with the futsal variable for the period 2014 - 2025.



Gambar 2. Density visualization

Based on the bibliometric analysis above, specifically, there has not been much research on circuit training-based basic futsal technique learning models for students. So researchers will conduct research on circuit training-based basic futsal technique learning models for students. It is hoped that this research can become reference material for providing futsal material at the tertiary level.

The novelty of this research lies in the application of a circuit training-based futsal learning model which specifically focuses on improving passing and ball control skills. Different from previous research which generally examines the effect of circuit training on physical fitness or skills in general, this study targets two basic techniques that most influence the rhythm and quality of the futsal game.

Based on this background, this research aims to analyze the effectiveness of the circuit training-based futsal learning model in improving passing and ball control skills in physical education students. The findings are expected to contribute to the development of a futsal learning curriculum that is more adaptive to the demands of the game, as well as offering alternative training strategies that can be implemented by coaches and sports educators at various levels.

METODE

This research uses a pre-experimental design with a one group pre-test post-test design model. This design was chosen to measure the effectiveness of the circuit training-based futsal learning model in improving passing and ball control skills in the same group before and after treatment. The study was conducted at the futsal field of the Faculty of Sports Science, Universitas Negeri Jakarta, during April to May 2025. The facilities and equipment utilized included an international-standard futsal court, FIFA-certified futsal balls, cones, passing targets, and a stopwatch for time measurement.

The population in this study consists of the 2023 cohort students of the Physical Education Study Program who are enrolled in the futsal course. The researchers selected the sample using purposive sampling based on the following criteria: (1) having at least one year of futsal playing experience, (2) being in good physical condition, and (3) agreeing to participate in the entire series of tests and training sessions. Based on these criteria, the researchers obtained 20 participants as the subjects of the study.

The researchers measured passing skills using the Futsal Passing Test, which assesses the accuracy and speed of passes. They measured ball control skills using the Futsal Control Test, which evaluates the ability to control the ball from various passing directions. Three nationally certified futsal experts validated both instruments, and the researchers tested their reliability using the test-retest method. The research procedure began with an initial measurement (pre-test). The participants then joined a futsal learning program based on circuit training for six weeks with a frequency of three sessions per week. Each training session lasted 90 minutes and included warm-up, station-based technical exercises (circuit), situational games, and cool-down. After the program was completed, the researchers conducted a final measurement (post-test) using the same instruments.

The researchers analyzed the data using a paired sample t-test to examine significant differences between pre-test and post-test scores. They used the Shapiro–Wilk test to assess normality and calculated the effect size (Cohen’s d) to determine the strength of the intervention effect.

RESULTS AND DISCUSSION

The measurement results of passing and control skills in the pre-test showed a highest score of 41, a lowest score of 33, a mean of 36.57, a standard deviation of 2, and a variance of 4. Furthermore, the measurement results of passing and control skills in the post-test indicated a highest score of 48, a lowest score of 41, a mean of 44.93, a standard deviation of 2, and a variance of 3. For greater clarity, the distribution of the pre-test and post-test results of futsal passing and control skills is presented in Table 1:

Table 1. Summary of Pre-Test and Post-Test Data on Futsal Passing and Control Skills

Measurement	*Pre-test*	*Post-test*
Total Score	1097	1348
Mean	36,57	44,93
Standard Deviation	2	2
Variance	4	3
Maximum Score	41	48
Minimum Score	33	41

Comparison of Pre-Test and Post-Test Results of Passing and Control Skills

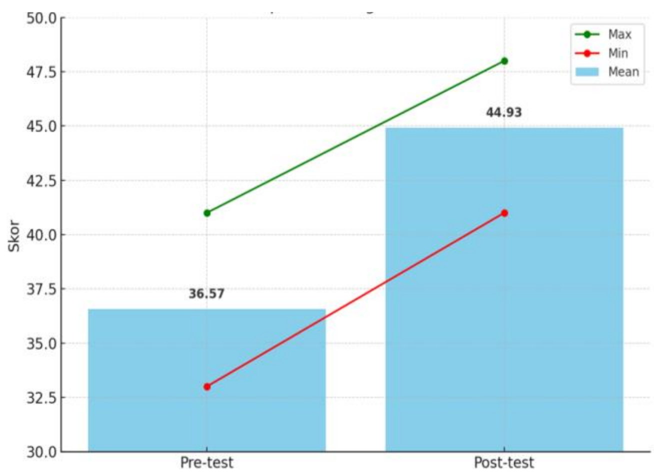


Figure 1. Comparison Diagram of Pre-Test and Post-Test Results of Futsal Passing and Control Skills

The comparison between pre-test and post-test results demonstrates a clear improvement in the participants' futsal passing and ball control skills. The mean score increased from 36.57 in the pre-test to 44.93 in the post-test, reflecting an improvement of 8.36 points. The maximum score also rose from 41 to 48, while the minimum score improved from 33 to 41. These findings indicate not only an overall enhancement in average performance but also consistent progress among participants across different ability levels. The reduction in performance gaps between the lowest- and highest-scoring participants suggests that the circuit-based learning model was effective in promoting equitable skill development within the group.

DISCUSSION

The participants' average skill score increased significantly from 36.57 in the pre-test to 44.93 in the post-test. This increase of 8.36 points indicates a positive effect of implementing the futsal circuit-based learning model on the mastery of passing and ball control techniques. The highest participant score rose from 41 in the pre-test to 48 in the post-test. This finding demonstrates that the top-performing participants also showed improvement, indicating that the training model not only benefited the group average but also enabled high-performing individuals to achieve more optimal results.

The lowest participant score also improved substantially, from 33 to 41. This improvement highlights that even participants with the lowest initial ability benefited from the training program, thereby reducing the performance gap among participants. Improvements across all indicators (mean, maximum score, and minimum score) provide strong evidence of the effectiveness of the futsal circuit-based learning model in enhancing passing and ball control skills.

In theory, circuit training combines structured exercises at various stations with a focus on repetition of movements and controlled intensity (Jung, Kim, and Park 2019). In the context of futsal, circuit-based training enables players to practice passing and ball control continuously under conditions that resemble actual game situations, thereby facilitating a more effective transfer of skills into real match performance.

This finding is strengthened by previous research, research by (Mahfud, Hariansyah, and Bina Bangsa Getsempena 2023) found that using the circuit training method for futsal athletes can improve passing and shooting skills significantly compared to conventional methods. As well as, (Zan Mufadillah1) 2022) reported that circuit-based training that focused on ball control was able to significantly improve the ball control abilities of Physical Education students. Furthermore, research on the circuit training-based futsal passing training model that has been developed by (Dahliana et al. 2025) has entered the very good category and can be applied to improve the abilities of futsal athletes in Palembang City.

Overall, the findings of this study affirm that the circuit-based futsal learning model is an appropriate approach to improving fundamental futsal skills, particularly passing and ball control, while simultaneously preparing players for actual game conditions. In the future, this model holds potential to be integrated into futsal learning curricula at universities as well as in sports clubs as a systematic and evidence-based training strategy.

CONCLUSION

Based on the findings of this study, the implementation of the circuit-based futsal learning model has been proven effective in improving students' fundamental futsal skills, particularly passing and ball control. The results showed a significant increase in post-test scores compared to pre-test, indicating that the model provided structured, repetitive, and game-oriented practice that enhanced both technical mastery and learning consistency. The circuit-based approach also offered a balanced combination of intensity and variation, allowing students to engage in continuous, systematic training while maintaining high levels of motivation and involvement. This structure not only facilitated skill acquisition for students with different levels of initial ability but also supported the development of motor learning through repetition under realistic playing conditions.

Therefore, it can be concluded that the circuit-based futsal learning model is a relevant and effective instructional strategy for physical education contexts. The model is recommended for integration into futsal courses and training programs to strengthen students' technical abilities and prepare them for actual game performance. Future research may expand this approach by combining circuit-based training with tactical instruction and psychological factors to achieve more comprehensive learning outcomes.

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