



## The Effect of the Form of Technical Training with *the Circuit Training Method* on Increasing *Shooting Accuracy* at the Aseto Tegalrejo Football School

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### Abstract

This study aimed to examine the effect of technical training using the circuit training method on improving shooting accuracy among students of Aseto Tegalrejo Football School. Previous studies have demonstrated the general benefits of circuit training for physical fitness and performance, however, limited research has specifically investigated its integrated application in enhancing technical skills, particularly shooting accuracy, in youth football training contexts. To address this gap, a quasi-experimental design with a two-group pretest–posttest approach was employed. The sample consisted of 30 students divided into an experimental group ( $n = 15$ ) and a control group ( $n = 15$ ) selected through purposive sampling. The experimental group received circuit training-based technical exercises, while the control group underwent conventional training. Shooting accuracy was measured using a standardized target-based test. Data were analyzed using paired and independent sample t-tests. The results showed a significant improvement in the experimental group mean score increased from 8.80 to 15.53 ( $p < 0.001$ ), while the control group showed a smaller improvement 7.67 to 12.13 ( $p < 0.001$ ). Furthermore, a significant difference was found between groups in posttest results ( $p < 0.001$ ). These findings indicate that circuit training is more effective in improving shooting accuracy and can serve as an alternative training method in youth football development.

**Keywords:** circuit training, shooting accuracy, technique training, youth football, experimental study

### INTRODUCTION

Football is one of the most popular sports and is in demand by various circles of society in the world, including in Indonesia. This sport is played by two teams consisting of eleven players each with the aim of putting the ball into the opponent's goal as much as possible and defending their own goal so that they do not concede (Nugroho & Muhammad, 2020). The high public interest in football can be seen from the number of football clubs and schools (SSB) spread across various regions. In addition, the enthusiasm of the community is also reflected in the support for the Indonesian national team and various competitions held from the regional to national levels (Kharis Moctar et al., 2021). Football is in demand by various age groups, from children to adults, both men and women (Hidayat et al., 2022).

In the game of football, mastery of basic techniques is an important factor that affects the quality of the game. Some of the basic techniques that players must master include passing, dribbling, controlling, heading, feinting, and shooting. Shooting is a technique of kicking the ball towards the opponent's goal with the aim of scoring a goal and becoming the main determinant of the outcome of the match (Wahono & Nasution, 2022). Shooting skills have a very vital role because they directly contribute to the achievement of scores (Rahmat et al., 2023). Good shooting requires not only technical precision, but also requires muscle strength, coordination, balance, concentration, and mental readiness of the players (Raharjo, 2018). Thus, shooting practice needs to be designed in a structured and comprehensive manner to be able to improve the technical aspects as well as the physical condition of the player.

However, in practice, problems are still found related to low shooting ability, especially in the aspect of kick power and accuracy. One of the reasons is that exercise methods are less varied and have not integrated physical fitness training optimally. Monotonous training can cause boredom and be less effective in improving the performance of the player's technique. In fact, improving the quality of

shooting requires a training approach that focuses not only on technique, but also on the development of strength, endurance, stability, and overall muscle coordination (Syakhisk et al., 2022).

One of the training methods that can be applied to improve physical condition and technical skills simultaneously is circuit training. Circuit training is a training method that combines several forms of training in a series (station) with minimal rest time (Kharis Moctar et al., 2021). This method was first developed by R.E. Morgan and G.T. Anderson in 1953 and was designed in several different training stations to train the various components of fitness in an integrated manner. Circuit training has been shown to be effective in improving muscle strength, cardiovascular endurance, agility, and flexibility through a combination of resistance and aerobic exercises. In addition to being efficient in terms of time, the variety of movements in circuit training can also increase motivation and reduce the boredom of training participants (Zan Mufadillah1), 2022).

Early childhood coaching plays an important role in determining the future of football achievements in Indonesia. Football schools as a forum for basic coaching have a responsibility in shaping the technical, physical, and mental abilities of players in a structured manner. A planned and systematic training program is the key to success in improving the quality of players from a young age. Therefore, there is a need for innovation in training methods that are able to improve engineering skills effectively and thoroughly.

Aseto Tegalrejo Football School, which was established in 2016 in Tegalrejo Village, Wirosari District, Grobogan Regency, Central Java, is one of the early childhood football coaching institutions that actively carries out training programs three times a week. Based on the results of observations and information from the coach, students' shooting abilities are still classified as less than optimal, especially in terms of kick strength and accuracy. The shooting practice that has been carried out so far tends to be less varied and only focuses on the target in front of the goal without modifying more innovative forms of training. This condition has an impact on the lack of optimal performance improvement and the appearance of boredom in students during training.

Based on these problems, a more varied, structured, and applicative approach to training is needed to improve shooting accuracy. One alternative that can be applied is circuit training exercises that integrate technical exercises and physical conditions in a series of programs. Therefore, this study aims to analyze the effect of circuit training training on improving shooting accuracy in students of Aseto Tegalrejo Football School as an effort to optimize the development of basic early childhood football techniques

## METHODS

This type of research is experimental research, more precisely *quasi-experimental research*. Because the implementation of the study does not allow full randomization of subjects. This research uses a design *two-group pre-posttest design*, i.e. a design involving two experimental groups and a control group (Jariono et al., 2025).

In this design, the two groups were first given a *pretest* to determine the initial ability of shooting accuracy. The experimental group was then given treatment in the form of technical training exercises using *the circuit training method*, while the control group was given conventional technical training according to the Football School program. After the treatment was completed, both groups were given a *posttest* to see the changes that occurred after the intervention.

The research site is in the field of Tegalrejo Village, Wirosari district, Grobogan Regency, Central Java. And the research was conducted in the Banyudono Field, Banyudono District, Boyolali Regency, Central Java. This study was carried out for 6 weeks with a frequency of training carried out as many as 16 meetings, including one initial meeting (*pretest*) then 14 meetings by providing *treatment* and one final meeting (*posttest*) with four meetings a week, Monday, Wednesday, and Friday. The training starts at 15.30-17.00 WIB.

The population in this study is all students of Aseto Tegalrejo Football School which totals 50 students and Bima Sakti Banyudono Football School which totals 60 students. The sampling technique uses purposive sampling with the following criteria: students actively participate in the exercise, are 12–15 years old, and are registered as students in each SSB. Based on these criteria, 30 qualified athletes were obtained, with 15 students from SSB Aseto Tegalrejo as the experimental group and 15 students from SSB Bima Sakti Banyudono as the control group.



The variables in this study consist of independent variables and bound variables. The free variable is technique training with the circuit training method (X), while the bound variable is shooting accuracy (Y). Shooting accuracy is defined operationally as the player's ability to kick the ball towards the goal which has been divided into several target zones with a specific score, which is measured through a shooting accuracy test.

The instrument used in this study is a shooting accuracy test which refers to a standard test format such as the Mor-Christian General Soccer Ability Skill Test. The test was carried out by each student conducting three kick attempts from a distance of 16.5 meters towards the goal which had been divided into seven zones with different values. Scores are obtained from the accumulation of points obtained based on the area of the goal hit by the ball. If the ball does not hit the target or comes out of the goal, then the score given is zero. This test instrument has a validity of  $r = 0.745$  and a reliability of  $r = 0.518$  which is analyzed using Pearson Product Moment correlation (Efendi & Widodo, 2019).

The research procedure begins with the preparation stage, including the management of research permits, sample determination, preparation of training programs, and the preparation of training instruments and facilities. The next stage is the implementation of a pretest to measure the initial ability to shoot the entire sample. Furthermore, the experimental group was given treatment in the form of circuit training exercises consisting of six stations, including zig-zag dribble to shooting, passing-control-shooting, running with the ball and power shooting, one touch shooting, first touch under pressure, and target shooting challenge. Each post is carried out for 60–90 seconds with a move between posts for 20–30 seconds and is carried out in 2–3 rounds. The training structure of each session consists of warm-up (10–15 minutes), core circuit training (35–45 minutes), and cool-down (5–10 minutes), with a total duration of 60–75 minutes per session. The control group continued to carry out conventional shooting technique training according to the SSB routine program. After the treatment period was over, the two groups again underwent a posttest using the same instrument as the pretest.

Data analysis was carried out using the help of the SPSS version 23 program. Before the hypothesis test is carried out, a prerequisite test is first carried out which includes a normality test using Shapiro-Wilk and a homogeneity test using the ANOVA test. The data is declared to be normally distributed if the significance value of  $p > 0.05$  and homogeneous if the  $p$ -value is  $> 0.05$ . Hypothesis testing was carried out using paired sample  $t$ -tests to determine the differences between pretest and posttest in each group and independent sample  $t$ -tests to determine the difference in results between the experimental group and the control group. The test results were based on a comparison of significance values ( $p < 0.05$ ) or a comparison between the calculated  $t$  values and the  $t$  tables.

## RESULTS AND DISCUSSION

### Research Results

This study was used to determine the Effect of Technical Training with the Method *Circuit Training* Against Accuracy *Shooting* at the Aseto Tegalrejo Football School. The subjects used in this study were students of Aseto Tegalrejo Football School and Bima Sakti Football School with a total of 15 students each. This research began with data collection *pre-test* on January 12, 2026 and ended with data collection *post-test* on February 19, 2026. The data was then analyzed using statistical analysis on the SPSS application. The summary of the overall data description is presented in the form of Table 1.

Table 1. Description of the results of technical training with *the circuit training method*

Variable	N	Mean	Median	SD	Min	Max
<i>Pre-test accuracy shooting</i> Experimental Group	15	8.80	9.00	1.265	7	11
<i>Post-test accuracy shooting</i> Experimental Group	15	15.53	15.00	1.807	13	19
<i>Pre-test accuracy shooting</i> Control Group	15	7.67	8.00	1.799	5	11

<i>Post-test accuracy shooting</i>	15	12.20	12.00	1.568	10	15
Control Group						

Based on Table 1, it can be described that the level of *shooting* accuracy in the experimental group when the *pre-test* was obtained on average of 8.80, a middle value of 9.00, a *standard deviation* of 1,265, the lowest score of 7 and the highest score of 11. The shooting accuracy level during the *post-test* of the experimental group was obtained with an average of 15.53, a median score of 15.00, a *standard deviation* of 1,807, the lowest score of 13 and the highest score of 19. Thus, there is an average difference between *pre-test* and *post-test* of 6.73.

Furthermore, the shooting accuracy level in the control group when the *pre-test* was carried out with an average of 7.67, a median score of 8.00, a *standard deviation* of 1,799, the lowest score of 5 and the highest score of 11. The level of *shooting* accuracy during the *post-test* of the control group was obtained with an average of 12.20, a middle value of 12.00, a *standard deviation* of 1,568, the lowest score of 10 and the highest score of 15. So that there is a difference of 4.53 for the average *pre-test* and *post-test* scores.

Before statistical analysis is carried out, a normality test, a homogeneity test, and a comparison test are first carried out. The normality test is used to find out whether or not the distribution of the data obtained is normal, the homogeneity test is used to find out if the sample comes from a homogeneous population, while the comparison test is used to find out if there is a difference between the two sample groups.

Normality testing uses *Shapiro-Wilk*. In this test, the hypothesis of a sample from a normally distributed population will be tested, to accept or reject the hypothesis by comparing a significant value with 0.05. The criterion accepts the hypothesis if the significance value is greater than 0.05, if it does not meet the criteria, the hypothesis is not normally distributed or rejected.

Table 2. Normality test results

Variable	Sig	Remarks
<i>Pre-test</i> experimental group	0.179>0.05	Normal
<i>Post-test</i> experimental group	0.532>0.05	Normal
<i>Pre-test</i> control group	0.468>0.05	Normal
<i>Post-test</i> control group	0.273>0.05	Normal

From the table above, the *P* values of all variables are greater than 0.05, so the hypothesis that the sample is based on a normally distributed population is accepted. From this information, the variable data in this study can be analyzed using parametric statistics

Furthermore, a homogeneity test was carried out to find out that the variance of the variables was the same, to accept or reject the hypothesis by comparing significant values. More than 0.05. The results of the homogeneity test can be seen from the table below.

Table 3. Homogeneity Test Results

Variable	Significant Value	Remarks
Circuit training <i>exercises</i>	0.538>0,05	Homogeneous

From the results of the calculation, a significance value of 0.538>0.05 is obtained which means that the variance of the sample is homogeneous, so the hypothesis that states the variance of the existing variables is the same or accepted. Thus, it can be argued that the population variance is homogeneous.

Table 4. Results of the experimental group hypothesis test

Variable	Mean	SD	t-stat	p-value (2-tailed)	Significance
<i>Pre-test</i>	8.80	1.21	-15.58	< 0.001	Significant
<i>Post-test</i>	15.53	1.73			



The results of the *Paired Sample T-Test* showed a very significant increase in the shooting accuracy level of the experimental group. The average score increased from 8.80 to 15.53. With a  $p < 0.001$  (less than 0.05), it can be concluded that the intervention or treatment given to the experimental group had a real impact on improving the accuracy of the shot.

Table 5. Results of the control group hypothesis test

Variable	Mean	SD	t-stat	p-value (2-tailed)	Significance
Pre-test	7.67	1.76	-9.60	< 0.001	Significant
Post-test	12.13	1.51			

The control group also experienced a significant increase in average from 7.67 to 12.13. Although not given experimental treatment, the  $p < 0.001$  suggests that this change remains statistically significant. This is common due to the usual routine exercise factor or the effect of maturing the subject during the study.

Table 6. Independent t-test results

Groups	Mean Post-test	SD	t-stat	p-value (2-tailed)	Remarks
Experiment	15.53	1.73	5.74	< 0.001	Significant Differences
Control	12.13	1.51			

Based on the *Independent Sample T-Test*, there was a significant difference between the final results of the experimental group and the control group. The average *post-test score* of the experimental group (15.53) was much higher than that of the control group (12.13). With a value of  $t = 5.74$  and  $p < 0.001$ , it can be concluded that the method applied to the experimental group was much more effective in improving shooting accuracy compared to the method in the control group.

## Discussion

The results of the study showed that technical training with *the circuit training* method had a significant influence on improving shooting accuracy in students of the Aseto Tegalrejo Football School. Based on the results of data analysis, there was an increase in the average shooting accuracy score in the experimental group from 8.80 during *the pre-test* to 15.53 during *the post-test*. The difference in improvement of 6.73 shows that the exercise program provided is able to significantly improve students' abilities. The significance value obtained from the *paired sample t-test*, which is  $p < 0.001$ , also shows that the increase is statistically significant. This shows that *the circuit training* method applied in the training program can provide an effective training stimulus in improving the player's shooting technique skills. This increase occurs because *circuit training* exercises combine various forms of technical training and physical conditions systematically so that players get more varied and structured exercises.

Theoretically, the improvement of shooting ability can be influenced by several physical components such as leg muscle strength, coordination, balance, and concentration when kicking towards the goal. Exercises with the method *circuit training* Able to train several of these components simultaneously through a variety of different training posts. In this study, there are several forms of training such as *zig-zag dribble to shooting*, *passing-control-shooting*, *running with the ball and power shooting*, *one touch shooting*, *first touch under pressure*, and *target shooting challenge*. The variety of exercises allows players to practice shooting techniques in various game situations so that the skills gained become more applicable. According to (Kharis Moctar et al., 2021), *circuit training* It is a training method that combines several forms of training in one series of posts with a relatively short rest time so that it is able to improve the fitness component as well as technical skills at the same time. In

addition, this method is also considered effective in increasing exercise motivation because the variety of movements carried out can reduce the saturation of training participants.

In addition to the experimental group, the improvement also occurred in the control group that underwent conventional engineering training. Based on the results of data analysis, the average score of the control group increased from 7.67 at *the pre-test* to 12.13 at *the post-test* with an increase of 4.46. The results of the statistical test also showed a significance value of  $p < 0.001$  which means that the increase was statistically significant. Improvements in the control group can occur because students continue to follow the regular exercises given by the trainer during the study period. In the process of football training, the continuous repetition of technical movements can improve the player's abilities due to the process of motor adaptation and improved movement coordination. However, the improvement that occurred in the control group was not as large as the experimental group, which shows that conventional training methods are still less than optimal in improving shooting skills to the maximum. This is because conventional exercises tend to be less varied and focus more on the repetition of techniques without the integration of physical conditioning exercises that support kick performance.

Comparison of *post-test results* between the experimental group and the control group also showed a significant difference. The experimental group obtained an average score of 15.53 while the control group only achieved an average of 12.13. The results of *the independent sample t-test* showed a t-value of 5.74 with a significance value of  $p < 0.001$  which means that there is a significant difference between the two groups. This shows that technique training with *the circuit training* method is more effective than conventional technique training in improving the shooting accuracy of young football players. The advantage of this method lies in the principle of systematic and integrated training, where each training post is designed to train the technical aspects as well as the physical conditions that support shooting performance. Exercises that are carried out repeatedly in several rounds also provide enough stimulus so that the player's body is able to adapt optimally to the demands of the movements performed.

The results of this study are also in line with several previous studies that stated that *the circuit training* method is effective in improving technical skills in various sports. Syakhisk et al. (2022) stated that exercises that integrate technical aspects and physical conditions simultaneously can provide more optimal results than engineering exercises performed separately. In addition, Rahmat et al. (2023) also explained that the improvement of shooting skills is not only influenced by technical ability, but also by physical conditions such as leg muscle strength, balance, and coordination of body movements. Thus, the application of training methods that combine these various components in one series of exercises will have a more effective impact on improving the player's abilities.

From the results of this study, it can be understood that *the circuit training* method provides a more comprehensive training experience for players. The training not only focuses on the technical aspects of kicking the ball into the goal, but also involves various elements of movement such as dribbling, ball control, movement without the ball, as well as decision-making in game situations. This condition makes players accustomed to shooting in various conditions that resemble real match situations. Thus, the skills acquired during practice can be more easily applied in the game. In addition, the relatively high intensity of training in *the circuit training* method also helps to increase the physical endurance of players so that they are able to maintain consistent technical performance during the match.

Based on this description, it can be concluded that technique training with *the circuit training* method is an effective training method to improve shooting accuracy in young football players. This method is able to provide a more varied, systematic, and integrated stimulus of training so that players can develop technical skills and physical conditions at the same time. Therefore, *the circuit training* method can be used as an alternative training program that can be applied by coaches in the process of coaching football players at football schools.



## CONCLUSION

Based on the results of the study, it can be concluded that technical training using the circuit training method has a significant effect on improving shooting accuracy among students of Aseto Tegalrejo Football School. The experimental group showed a greater increase in shooting accuracy compared to the control group, indicating that the applied training method provided a more effective stimulus for skill development.

Although the control group also demonstrated improvement through conventional training, the magnitude of improvement was lower than that of the experimental group. The significant difference in posttest results between the two groups further confirms the effectiveness of the circuit training method.

Therefore, circuit training can be recommended as an effective and practical training method for improving shooting accuracy, particularly in youth football development programs. Future training programs are encouraged to integrate technical and physical components to achieve optimal performance outcomes.

## FUTURE RECOMMENDATION

Based on the findings of this study, it is recommended that coaches and football training practitioners incorporate circuit training-based technical exercises into their training programs, particularly in youth football development, as this method has been proven to provide a more effective and structured stimulus for improving shooting accuracy. Future research is suggested to involve a larger sample size and a longer intervention period to obtain more comprehensive results and strengthen the generalizability of the findings. In addition, further studies are encouraged to examine the effect of circuit training on other technical skills and physical components, as well as to include effect size analysis and additional performance indicators to provide a deeper understanding of training effectiveness.

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## **CONFESSION**

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