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Development of a Speed Training Model Using Running with the Ball Technique for football Athletes Aged 15–17 Years

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Abstract. This study developed a speed training model of the running *with the ball* technique of football athletes aged 15–17 years. The study is based on physical test data over the past five years on North Sumatra PPLP athletes which shows that most of the athletes are in the medium and low speed categories. This research uses *the Research and Development* (R&D) method adapted from the Borg and Gall models. The research subjects consisted of 52 athletes from four football clubs in Medan City. The research stages include needs analysis, product design, small group trials (12 athletes), product revisions, large group trials (40 athletes), and final evaluation. Data collection techniques through observation, interviews, questionnaires, and speed tests. The results of the study were in the form of 15 speed training models based on *the running with the ball technique* which were declared valid and feasible based on the results of expert validation and athlete responses. The developed training model has been proven to be effective in improving athletes' motivation, participation, and speed performance in contextual match situations.

Keywords: Development, Training Model, Running with the ball, football, 15-17 years old.

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1 Introduction

Football is a sport that requires good physical ability and endurance (Arridho, Padli, Arwandi, & Yenes, 2021), Running is one of the physical abilities that must be possessed by football players (Gayatri, Reniwati, Bahren, Ramadani, & Solfiyeni, 2025)(Hidayat & Rahmadani, 2023) Running is needed to change positions as quickly as possible to chase the ball, break the opponent's attack, utilizing the empty space on the field (Andibowo, Budiyono, Hartini, Prakosa, & Prasasti, 2024) Running speed also plays a role in supporting technical skills such as dribbling which is one of the basic techniques in football that allows players to maintain possession of the ball and create attack opportunities (Sridadi, Septiasari, Parijan, Yuliarto, & Ilham, 2021), dribbling practice while running has been shown to help to improve abilities dribbling in football games (Febrian & Bakti, 2021) Players who have a higher running speed tend to have better dribbling performance (Saepudin, Hermawan, & Permadi, 2024) speed training has a positive influence on the technical skills of soccer players (Chafidz, Juli, Ala, & Troyanovska, 2023) in addition speed training also improves efficiency and control in dribbling (Rizal & Nurulita, 2025). Football practice practice that occurs a lot, coaches still use conventional speed training methods that are separate from ball techniques, so they are less relevant to the demands of complex match situations (Rizky et al., 2024), The running with the ball approach unites physical and technical aspects, namely the ability to run fast while controlling the ball according to the situation when competing on the field (Alfianurrohman, Hadi, & Prastiwi, 2024)

Based on the results of physical tests for the last 5 years at PPLP North Sumatra as a place to coach adolescent or junior athletes, according to data obtained from the North Sumatra Provincial Youth and Sports Office, it supports the previous coach's statement which shows that the physical condition of the players is very poor. The physical tests that experienced the most decline occurred in the 30-meter run and 20-meter run tests. The ability of players is always in the sufficient category every year of all players in PPLP North Sumatra.

Table 1.Results of Physical Test of PPLP Football Athletes' Speed Over the Last 5 Years

No	Criteria	Year				
		2020/2021	2021/2022	2022/2023	2023/2024	2024/2025
1	Very Good	-	-	-	-	-
2	Good		-	-	2	4
3	Sufficient	11	14	10	14	14
4	less	10	8	12	6	4
5	Less Once	-	-	-	-	-
	Quantity	21	22	22	22	22

After the author obtained physical speed data from North Sumatra PPLP football athletes, then the author carried out an observation and observation process when the North Sumatra PPLP football team conducted a trial match. Researchers see that players often make mistakes when they have the ball. Players often lose the ball and are always late in regaining the ball. Players also always lose in running when the opponent runs fast from the edge carrying the ball which results in the opponent very easily making a long pass to the goal to be headed by the opponent so that he scores. In addition, players rarely dare to make a quick run to dribble into an empty space when counterattacking the opponent's goal. Of course, this situation is very detrimental for the team when they have the opportunity to score goals or try to win the match.

For these reasons, which have been widely described above, researchers are trying to develop a speed training model. The ability to run at full speed combined with basic techniques is no longer so difficult for athletes aged 15-17 years to understand. Especially at that age players start to think rationally and always want to know the reason behind the actions. Athletes whose physical condition is more developed at that age will be able to develop physically if they are given training related to basic football techniques with changes in the situation such as the delay of matches so that they can make training conditions interesting. The author tries to develop the player's ability to focus more on running speed over long distances without much touch on the ball. This technique is called running with the ball. The main reason the author gave this training model is in accordance with the guidelines of the Indonesian football curriculum.

The running with the ball technique is a form of training that requires players to run as fast as possible while in possession of the ball. This exercise not only focuses on running speed but also requires players to be able to stay balanced to control the ball so that it is not grabbed by the opponent. This exercise will be different from the form of speed training that has been given by the coach. Exercises that only focus on running to a certain area are developed through the ball as its target so that it provides another motivation for the athlete, namely chasing the ball without realizing that he is running after it at full speed.

The author conducted a needs analysis in several junior football clubs in the city of Medan in order to find out the problems experienced by students during training. The results obtained based on the analysis of the needs of athletes were obtained information that 100% of athletes understand that physical condition speed is very important in football. 30% stated that it was difficult to do speed in the match. 43% who said speed training needed a new model. 9% of athletes want to be able to master good speed. 17% of athletes stated that they needed running with the ball technique to be included in speed training.

Looking at the results that have been stated by the needs analysis and several factors that are problems on the field both during training and matches, the author wants to develop speed training using the ball so that the speed of the player continues to increase so that football athletes are more qualified. In addition, the researcher hopes that the training model developed will be effective and efficient so that athletes do not always feel bored and get bored quickly. With a varied training model through a combination of technical, physical, tactical and mental aspects, it can make the physical condition of athletes continue to improve and a pleasant training atmosphere for athletes.

2 Method

This study uses the Research and Development (R&D) research method, which is a method used to develop a new product or improve an existing product (Surimeirian, Roberto, & Fajar, 2025) the product that will be produced in this study is in the form of 15 running with the ball training methods. The development procedures used in this study are (1) formulating potentials and problems, (2) collecting data and information, (3) product design, (4) design validation, (5) design improvement, (6) product trials, (7) product revisions, (8) usage trials, (9) product revisions, (10) mass product manufacturing (Fajar, Woro, Handayani, & Yudha, 2022)

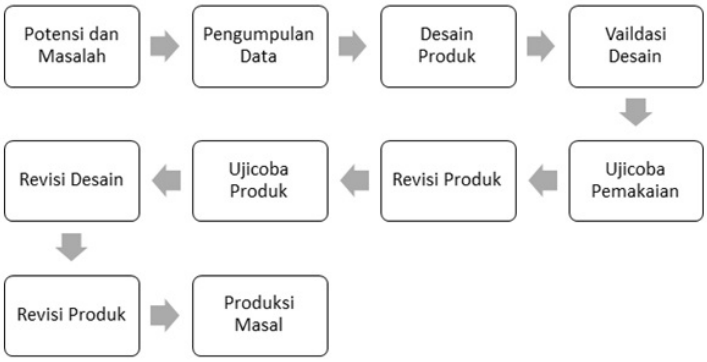

Figure 1. Steps of development research methods

The research was carried out from July to September 2025 in four football clubs in the city of Medan, namely: (1) Medan Sakti FC, (2) PS Harjun Putra, (3) Patriot Disporasu, (4) SSB Bina Pratama Medan. The study population consisted of 52 football athletes aged 15-17 years, with the sampling technique using the total sampling technique so that all members of the population were used as research samples. 12 athletes will be sampled in small-scale product trials and 40 athletes in large-scale product trials

Data collection techniques use observation, interviews, questionnaires, and speed tests. The research approach uses mixed methods that combine qualitative and quantitative analysis (Azhari, Afif, Kustati, & Sepriyanti, 2023). The validators in this study consist of three experts who have competence in the field of football, namely two football coaches and one academic/lecturer who is an expert in football. The validators involved in this study are:

Table 2 Names of Experts/Experts

No	Name	Instances	Areas of Expertise
1	Agustiono	Football Coach	Football Coaching Expert
2	Supriono	Football Coach	Football Coaching Expert
3	Dr. Nurkadri, M.Pd	FIK UNIMED	Football Expert Lecturer

The product developed is in the form of 15 speed training models that integrate elements of agility, reaction, and ball control in a training situation that resembles a match.

3 Result

The results of the needs analysis showed that speed training was carried out in every training session, but most still used the conventional sprint method without directly involving the ball. Athletes also reported high levels of boredom due to repetitive exercise patterns. The final product produced is in the form of 15 speed training models based on the running with the ball technique.

The expert validation instrument used an assessment questionnaire in the form of a Likert scale with a score range of 1–5, which consisted of several aspects of assessment, namely: (1) the suitability of the training objectives, (2) the systematics of the exercise implementation, (3) the suitability with the characteristics of athletes aged 15–17 years, (4) the elements of speed, agility, reaction, and ball control, and (5) the safety and effectiveness of the training model. Based on the results of the assessment of three validators on the design of the speed training model using the running with the ball technique, the following results were obtained:

Table 3. Expert Validation Results of the Running With The Ball Speed Training Model

Score validators	obtained	a maximum score	percentage
Football Coach	92	100	92%
Football Coach	94	100	94%
Football Expert Lecturer)	96	100	96%
Average	282	300	94%

The validation results from experts show that the training model is declared feasible and in the very good category.

Athletes' responses to both small and large group trials showed increased motivation and involvement in the training process. The following are the results of the athletes' assessment in the small group trials and large group trials:

Table 4. Athletes' response rates to small group tests

No	Training Model	Percentage	Criteria	Classification
1	Model 1	91,66%	Very Good	Very Decent
2	Model 2	83,33%	Good	Decent
3	Model 3	91,66%	Very Good	Very Decent
4	Model 4	100%	Very Good	Very Decent
5	Model 5	91,66%	Very Good	Very Decent
6	Model 6	91,66%	Very Good	Very Decent
7	Model 7	83,33%	Good	Well Used
8	Model 8	83,33%	Good	Well Used
9	Model 9	91,66%	Very Good	Very Decent
10	Model 10	83,33%	Good	Well Used
11	Model 11	91,66%	Very Good	Very Decent
12	Model 12	83,33%	Good	Well Used
13	Model 13	100 %	Very Good	Very Decent
14	Model 14	91,66%	Very Good	Very Decent
15	Model 15	83,33%	Good	Well Used
Total Percentage		1341,6 %		

Based on the table above, the results of the athlete response questionnaire in small-scale trials were answered with a percentage of 89.44%, with the Good category.

Table 5. Athletes' response rates to large group tests

No	Training Model	Percentage	Criteria	Classification
1	Model 1	100 %	Very Good	Highly Worth It
2	Model 2	87,50%	Good	Worthy
3	Model 3	90 %	Good	Worthy
4	Model 4	95 %	Very Good	Highly Worth It
5	Model 5	87,50%	Good	Worthy
6	Model 6	97,50%	Very Good	Highly Worth It
7	Model 7	90 %	Good	Worthy
8	Model 8	100 %	Very Good	Highly Worth It
9	Model 9	95 %	Very Good	Highly Worth It
10	Model 10	90 %	Good	Worthy
11	Model 11	92,50%	Very Good	Highly Worth It
12	Model 12	92,50%	Very Good	Highly Worth It
13	Model 13	100 %	Good	Worthy
14	Model 14	95 %	Very Good	Highly Worth It
15	Model 15	85 %	Good	Worthy
Total Percentages		1397,5 %		
Average		93,16 %	Very Good	Efficient

Based on the table above, the results of the athlete response questionnaire in large-scale trials were obtained with a percentage of 93.16%, Very Good.

4 Discussion

The results show that the integration of speed training and ball control can improve performance in a more contextual way. Speed and agility training has been proven to have a significant influence on improving the dribbling skills of football players (Indrawan & Muhammad, 2025) In addition, the use of training methods such as small sided games that combine elements of technique and physical condition is also effective in improving players' dribbling skills (Marda, El, Lanos, & Rosani, 2024).

Compared to conventional sprint exercises, training models that integrate dribbling techniques can simultaneously improve the player's coordination of movement, agility, and speed (Pradnyani, Pramita, Tianing, & Antari, 2025). Specific dribbling practice methods have also been shown to be able to significantly increase dribbling speed in football players

(Hadimansyah, Mulyadi, & Satriawan, 2025). In addition, dribbling ability is also influenced by components of physical condition such as player speed and balance (Rohman & Akhbar, 2023). Therefore, dribbling practice that is integrated with physical components is very important in improving the technical performance of football players (Hafid & Sudarmono, 2025). Thus, the training model developed in this study contributes both theoretically and practically to the methodology of youth football training.

5 Conclusion

This study produced 15 speed training models using the running with the ball technique that have been validated and declared feasible to be applied to football athletes aged 15–17 years. The training model developed has been proven to be able to improve speed performance contextually, training motivation, and athlete involvement in the training process. This product can be used as an innovative alternative for coaches in designing speed training programs that are more applicable and based on match situations.

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