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Development of Service Training Model for Sepaktakraw Athletes in DKI Jakarta

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Abstract

This study aims to develop an effective and efficient service training model for sepaktakraw athletes in DKI Jakarta. The research method employs Research and Development (R&D) using the Borg and Gall development model, which consists of ten development steps. The research subjects were divided into two groups: a small group (10 athletes from the UNJ Prestasi Sports Club for sepaktakraw) and a large group (30 athletes from Regional Sport Training Center and Student Sports Training Center of DKI Jakarta). The study produced 15 variations of service training models validated by three experts: the coach of Regional Sports Training Center Sepaktakraw DKI Jakarta, the assistant coach of Regional Sports Training Center, and a sepaktakraw expert lecturer from UNJ. Validation results indicated that all models were deemed feasible for implementation. Analysis data using the t-test showed a significant improvement between the pre-test and post-test scores, with t-value = 24.030 > t-table = 1.699 ($p = 0.000 < 0.05$). The developed training models integrate the use of tools such as balance balls, resistance bands, and PVC pipes, which have proven effective in enhancing athletes' service skills. Although requiring intensive supervision, these models successfully created training variations that maintained athlete motivation and prevented boredom during the training process.

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INTRODUCTION

Sports are a physical activity that plays a vital role in human life, not only as a means of maintaining fitness but also as a platform for achievement and self-development. In the context of sports development, there are three main scopes: educational sports, competitive sports, and recreational sports (Pratama et al., 2022). Each has distinct characteristics and objectives, yet all contribute to enhancing the overall quality of human life.

Sepaktakraw, as one of the competitive sports, has undergone significant development from a traditional sport to a modern competitive discipline. (Pavilas et al., 2024 observed that sepaktakraw has now evolved into a captivating sport, reaching various countries in Asia, Europe, the Americas, and Africa. This sport combines elements from three other sports: volleyball (in terms of the scoring system), badminton (in terms of court dimensions), and soccer (in terms of the use of body parts).

Indonesia›s achievements in sepaktakraw have demonstrated encouraging consistency, particularly over the past four years, as presented in **Tabel 1**.

Table 1. Indonesian Sepaktakraw Achievements in the Last 4 Years

Sport Event	Nomor	Champion	Years
Asean School Games, Indonesia	Team Squad	Silver	2019
	Team	Silver	
	Double Event	Gold	
Sea Games, Phillipines	Double Team	Gold	2019
	Team Squad	Bronze	
Sea Games, Vietnam	Double Event	Gold	2021
	Regu	Bronze	
	Quadrant	Silver	
Sea Games, Kamboja	Tim Double	Gold	2023
	Double Event	Gold	
	Quadrant	Silver	
Asian Games, China	Quadrant	Silver	2023
	Team Squad	Bronze	

In an effort to enhance performance, the service holds a crucial role as the first attack in sepaktakraw. (Saputa Mahendra & M. Ridwan, 2019) identified various components of service techniques, including body height, leg reach, leg muscle strength, flexibility, foot contact with the ball, hip rotation, ball trajectory, and coordination. (Ayu Retno WD & Machfud I, 2019).

The Student Sports Education and Training Center of DKI Jakarta Province, under the supervision of the Youth and Sports Office (Department of Education and Sports), has played an important role in coaching sepaktakraw athletes. This program continues the efforts of the Student Sports Training Center (Senior High School), aiming to develop sports talents at the university level.. (Jamalong, 2014)

Based on observations and interviews with the coaches of the DKI Jakarta Men›s Sepaktakraw Pelatda, issues related to the athletes› balance and stability during service were identified. These issues have a significant impact on team performance, as the service, being the first attack, holds a high potential for determining the outcome of a match. (Wulandari, 2024)

Several previous studies have attempted to address service-related issues in sepaktakraw. (Samsudin et al., 2022) developed a comprehensive training program that includes warm-up exercises, variations of basic techniques, advanced techniques, and accuracy training. (Rengge et al., 2022) integrated the use of additional tools such as balance balls, PVC pipes, and resistance bands in the development of 17 service training models. Meanwhile, (Gani, 2018) developed a service training model with a gradual level of difficulty.

This study aims to develop an effective and efficient service training model for sepaktakraw athletes in DKI Jakarta, utilizing various modern training tools. The development of this model is expected to provide variety in training, enhance athlete motivation, and ultimately contribute to the improvement of Indonesia›s sepaktakraw performance on the international stage. (Syam A, 2022)

The innovation in this study lies in the development of a practical and efficient training model, with a specific focus on sepaktakraw athletes in DKI Jakarta. The developed model is expected to make a significant contribution to training variations and the enhancement of athlete skills, and it can serve as a foundation for further research in a broader scope.

METHOD

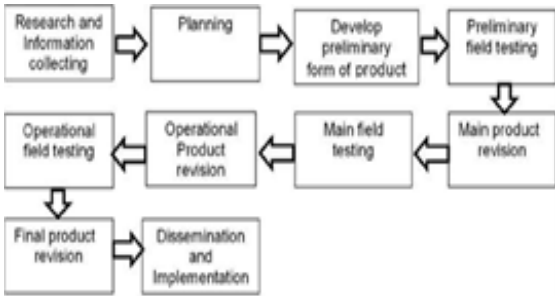
This study uses the Research and Development (R&D) method with the Borg and Gall development model, which consists of ten development steps. The aim of this research is to produce various training variations as a reference for se-

paktakraw coaches, particularly in the training of team service techniques. The development of this training model is expected to improve the service skills of sepaktakraw athletes in DKI Jakarta.

The research was conducted at the Post-graduate School of Universitas Negeri Jakarta, with a small group trial held at the UNJ Prestasi Sepaktakraw Sports Club. Pre-test and post-test assessments, along with the large group trial, were carried out with athletes from DKI Jakarta. The research period lasted from January to December 2024, with the following stages: proposal preparation (January-February 2024), research phase (May-June 2024), and the preparation of research results (June-December 2024).

The population of the study consists of sepaktakraw athletes from DKI Jakarta. The research sample is divided into two groups: (1) a small group consisting of 10 athletes from the UNJ Achievement Sepaktakraw Sports Club, and (2) a large group consisting of 30 athletes from Regional Sports Training Center and Student Sports Training Center of Jakarta. The sampling technique used is purposive sampling, based on pre-determined criteria.

This study adapts the Borg and Gall development model, which consists of ten stages (Borg et al., 2003). These stages include: (1) research and information gathering, (2) planning, (3) development of the initial product prototype, (4) initial field testing, (5) revision of the main product, (6) main field testing, (7) revision of the operational product, (8) operational field testing, (9) final product revision, and (10) dissemination and implementation.



Picture 1. Design Diagram Model Flow Chart Borg and Gall (Borg & Gall, 1998)

In the development of the service training model, the researcher designed 15 variations of training models to be validated by experts. These models cover various aspects of service techniques, utilizing tools such as balance balls, resistance bands, and PVC pipes. Below is the design of the training models developed **Table 2.**

Table 2. Concept of the Service Training Model Design

Model Name
Leg swings using leg weights with wall support
Self-serve against a wall using a resistance band
Service Simulation towards the wall
Drill service from the skipper's circle
Simulation of service movements in a lying position using a resistance band
Shadow serve simulation using balance ball and foot weights
Shadow service simulation passing through PVC pipe poles
Service simulation using balance ball support
Shadow service simulation using resistance bands
Swing your legs over the PVC pole using foot weights
Service Simulation with a Dropping Ball
Service simulation obstructed by PVC pipe pole
Simulation of service towards the net with resistance band
Simulation of service towards the pecing pad passing through the PVC pole
Simulation of service towards the pecing pad using resistance band

Validation was conducted by three experts, consisting of the coach and assistant coach of Regional Sports Training Center Sepaktakraw DKI Jakarta, and a sepaktakraw expert lecturer from UNJ. The experts assessed the feasibility of the developed training model using a prepared validation instrument.

The main instrument in this study is a sepaktakraw service test that has been validated by experts. This test measures the accuracy and effectiveness of the service using a scoring system based on predetermined target zones. The court area is divided into several zones with different point values (1-3 points), as shown in **Picture 2**.

tive and quantitative approaches. Qualitative analysis was conducted on input and suggestions from experts and observations during the model trial. Quantitative analysis used a t-test to compare the results of the pre-test and post-test to determine the effectiveness of the developed training model.

The research design for the effectiveness test used True Experimental Design with the

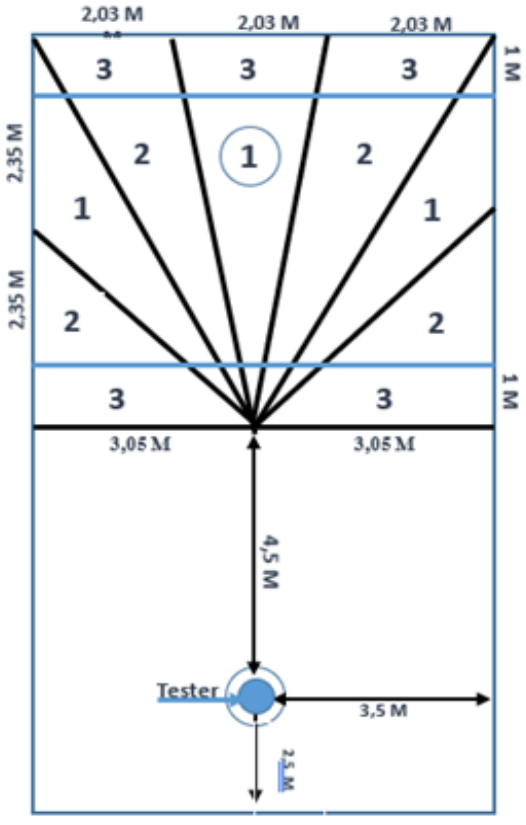
form of Pre-test Post-test One Group Design (Sugiyono, 2013). Statistical analysis was conducted using SPSS version 26 to test the research hypothesis that suspected a significant effect of the application of the team service training model on sepaktakraw athletes in DKI Jakarta.

Characteristics of the Developed Model

The developed training model has the following characteristics:

1. Effective: varied and quality training with appropriate training media
2. Efficient: maximizes results in a relatively short time
3. Interesting: has the appeal to motivate athletes
4. Appropriate: according to the needs of sepaktakraw service techniques
5. Systematic: has structured movement stages

The final result of this research is a comprehensive and validated team service training model product, which will be documented in the form of a guidebook for use by sepaktakraw coaches and athletes in DKI Jakarta.



Picture 2. Sepaktakraw Team Service Test Assessment Area (Vivien EP, 2021)

The test implementation includes:

1. The tester stands in the tekong position
2. The ball is thrown by a partner
3. The tester serves towards the target zone
4. Each tester is given 10 service opportunities

Scoring is done based on the zone where the ball falls:

- Zone 1 = 1 point
- Zone 2 = 2 points
- Zone 3 = 3 points
- Ball goes out or does not pass over the net = 0 points

The research data were analyzed using qualita.

RESULTS AND DISCUSSION

This study resulted in the development of a service training model for sepaktakraw athletes in DKI Jakarta using the Borg and Gall development model. The results of the study are described in several stages of analysis and model development. The needs analysis conducted through in-depth interviews with Pelatda Sepaktakraw DKI Jakarta coaches revealed four main objectives of model development, namely: providing a variety of team service training, providing references for coaches and athletes, increasing the variety of training processes, and preventing athlete boredom during the training process. The results of the needs analysis indicate that coaches need a more varied and innovative service training model, considering that existing training models tend to be monotonous and less motivating for athletes.

Based on the results of interviews with coaches (Table 1), it was found that although the coach had provided team service technique training, more references and variations were still needed in the training program. The facilities and infrastructure used were still limited to standard equipment such as fields, nets, rackets and balls. This is in line with the findings Kartika & Hakim (2020) which stated that training variations play an important role in increasing athlete motivation and performance.

The development of the model resulted in 15 variations of service exercises that were designed systematically and progressively. These models cover various aspects such as balance, strength, flexibility, and coordination. One of the models developed is a shadow service simulation using a balance ball and foot weights, which aims to train the balance of the supporting leg when serving. This model received a positive response from experts because it provides new challenges

for athletes while training important technical aspects. Model validation was carried out by three experts: the DKI Jakarta Sepaktakraw Training Center Coach, the Regional Training Center Assistant Coach, and the UNJ Sepaktakraw expert lecturer. The validation results (Table 2) show that all 15 models are declared feasible to be implemented. The experts assessed that the models developed are innovative and have never been applied in previous sepaktakraw team service technique training.

Tabel 4. about the Expert Justification Test Results

Model	Maximum Score	Result			Total	Explanation
		P1	P2	P3		
Model 1	3	1	1	1	3	Possible
Model 2	3	1	1	1	3	Possible
Model 3	3	1	1	1	3	Possible
Model 4	3	1	1	1	3	Possible
Model 5	3	1	1	1	3	Possible
Model 6	3	1	1	1	3	Possible
Model 7	3	1	1	1	3	Possible
Model 8	3	1	1	1	3	Possible
Model 9	3	1	1	1	3	Possible
Model 10	3	1	1	1	3	Possible
Model 11	3	1	1	1	3	Possible
Model 12	3	1	1	1	3	Possible
Model 13	3	1	1	1	3	Possible
Model 14	3	1	1	1	3	Possible
Model 15	3	1	1	1	3	Possible

Small group trials were conducted on 10 athletes from the Achievement Sports Club of the State University of Jakarta. The results of the trial showed that the training models could be applied with several notes of improvement, especially related to infrastructure and technical

Table 3. Results of Needs Analysis and Field Findings.

Finding Question	Items
How is the sepaktakraw service technique training model given by the trainer to the athletes? The Sepaktakraw DKI Jakarta trainer has provided team service technique training, but more references and variations are needed in providing service technique training programs so that athletes do not get bored and motivation is maintained.	How is the sepaktakraw service technique training model given by the trainer to the athletes? The Sepaktakraw DKI Jakarta trainer has provided team service technique training, but more references and variations are needed in providing service technique training programs so that athletes do not get bored and motivation is maintained.
Are there any varied training models during team service technique training? In the training process, there has been no varied training using additional equipment for DKI Jakarta athletes for team service technique training.	Are there any varied training models during team service technique training? In the training process, there has been no varied training using additional equipment for DKI Jakarta athletes for team service technique training.
What are the facilities and infrastructure used in the team service training model? The facilities and infrastructure used are the same as in general fields, nets, rackets and balls. The rest are just cones.	What are the facilities and infrastructure used in the team service training model? The facilities and infrastructure used are the same as in general fields, nets, rackets and balls. The rest are just cones.
How enthusiastic are the athletes during the team service technique training stage? Athletes in DKI Jakarta are generally enthusiastic in the training process, only when doing service techniques do athletes often feel bored. Therefore, the trainer needs to provide variations on team service techniques in playing sepaktakraw with the help of equipment.	How enthusiastic are the athletes during the team service technique training stage? Athletes in DKI Jakarta are generally enthusiastic in the training process, only when doing service techniques do athletes often feel bored. Therefore, the trainer needs to provide variations on team service techniques in playing sepaktakraw with the help of equipment.
Is it necessary to develop a new training model for service techniques in sepaktakraw team games? Yes, development in training models is very much needed because with the advancement of the world of sports today, coaches must often develop training models to adjust to the development of techniques, the needs of athletes, and athletes often feel bored with training programs that are less varied.	Is it necessary to develop a new training model for service techniques in sepaktakraw team games? Yes, development in training models is very much needed because with the advancement of the world of sports today, coaches must often develop training models to adjust to the development of techniques, the needs of athletes, and athletes often feel bored with training programs that are less varied.

implementation.

This is in line with research (Mardela & Rahman, 2017) which emphasizes the importance of adjusting the training model to field conditions. The large group trial involved 30 athletes consisting of 8 male Regional Training Center athletes from DKI Jakarta, 7 college student training center athletes from DKI Jakarta, 5 Student Training Center athletes from DKI Jakarta, and 10 Sustainable Sports Achievement Development athletes from DKI Jakarta. The results of the pre-test and post-test data analysis showed a significant increase. The mean value increased from 27.50 in the pre-test to 53.40 in the post-test. The results of the t-test showed t-count = 24.030 > t-table = 1.699 with p = 0.000 < 0.05, indicating a significant difference before and after the implementation of the training model.

Table 5. Results of Pre-Test - Post-Test Effectiveness Test

	N	Range	Min.	Max.	Mean	Std. Deviation
Pretest	30	27.00	15.00	42.00	27.5	6.12935
Post test	30	52.00	29.00	81.00	53.4	11.99023
Valid N (listwise)	30					

The developed training models have advantages in improving the quality of team service skills and providing new references for coaches. However, there are several important notes for improving the model, such as adjusting the height of the PVC pole to the reach of the tekong and the importance of monitoring athlete safety when using aids such as balance balls and resistance bands.

The main drawback of the model developed is the need for intensive supervision from the coach to ensure the accuracy of the movements and the safety of the athletes. This is in line with the findings of (Artyhadewa, 2017) which emphasize the importance of supervision in the implementation of new training models. Meanwhile, the advantages of the model lie in its effectiveness and efficiency in improving service skills, as well as its ability to create a more challenging and less boring training atmosphere.

The results of this study provide significant contributions to the development of sepak-takraw training methods, especially in team service techniques. The models developed not only improve the technical skills of athletes, but also succeed in creating variations in training that can maintain athlete motivation during the training process. This is important considering that monotonous training is often an obstacle in developing athlete performance.

These findings reinforce previous research on the importance of variation in sports training models (Samsudin et al., 2023); (Ramadhan & Bulqini, 2018). The use of aids such as balance balls and resistance bands in training models has been shown to be effective in improving the balance and strength aspects required in sepak-takraw service techniques.

Model 1. Leg swings using leg weights with wall support

Picture 3. Leg swings using leg weights with wall support

Model 2. Self-serve against a wall using a resistance band

Picture 4. Self-serve against a wall using a resistance band

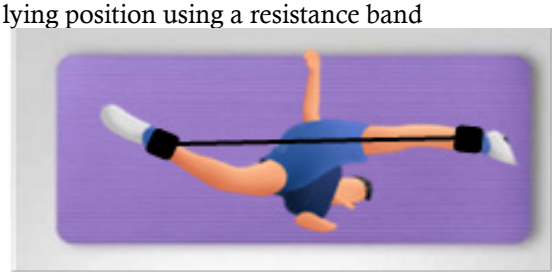
Model 3. Service Simulation towards the wall

Picture 5. Service Simulation towards the wall

Model 4. Drill service from the skipper's circle

Picture 6. Drill service from the skipper's circle

Model 5 Simulation of service movements in a lying position using a resistance band



Picture 7. Simulation of service movements in a lying position using a resistance band

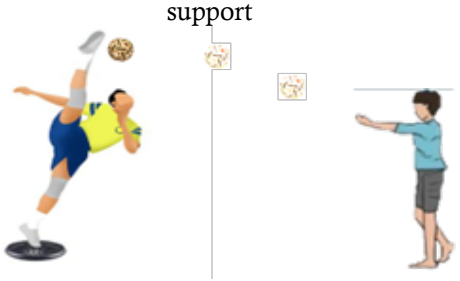
Model 6 Shadow serve simulation using balance ball and foot weights

Picture 8. Shadow serve simulation using balance ball and foot weights

Model 7 Shadow service simulation passing through PVC pipe poles

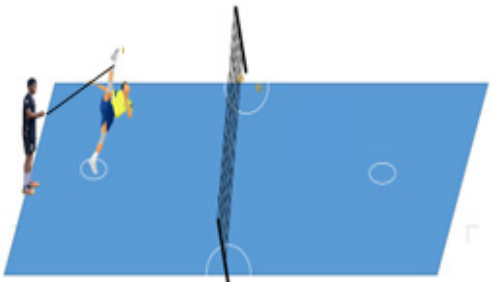
Picture 9. Shadow service simulation passing through PVC pipe poles

Model 8 Service simulation using balance ball support



Picture 10. Service simulation using balance ball support

Model 9 Shadow service simulation using resistance bands

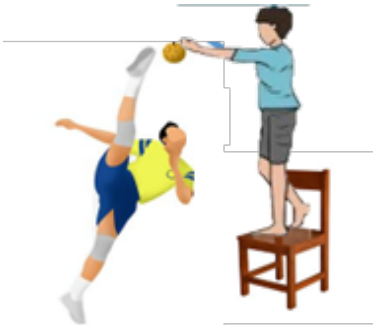


Picture 11. Shadow service simulation using resistance bands

Model 10 Swing your legs over the PVC pole using foot weights

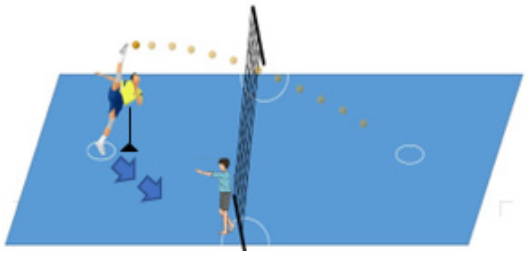
Picture 12. Swing your legs over the PVC pole using foot weights

Model 11 Service Simulation with a Dropping Ball



Picture 13. Service Simulation with a Dropping Ball

Model 12 Service simulation obstructed by PVC pipe pole



Picture 14. Service simulation obstructed by PVC pipe pole

Model 13 Simulation of service towards the net with resistance band

Picture 15. Simulation of service towards the net with resistance band

Model 14 Simulation of service towards the pecing pad passing through the PVC pole

Picture 16. Simulation of service towards the pecing pad passing through the PVC pole

Model 14 Simulation of service towards the pecing pad passing through the PVC pole

Picture 17. Simulation of service towards the pecing pad passing through the PVC pole.

CONCLUSION

The research on the development of service training models for sepaktakraw athletes in DKI Jakarta has succeeded in producing 15 variations of effective and innovative training models. These models were developed through the Research and Development (R&D) method with the Borg and Gall approach, which involves a series of systematic stages from needs analysis to implementation. The validation results from three experts showed that all training models were feasible to implement. Trials conducted on small groups (10 athletes) and large groups (30 athletes) showed a significant increase in service skills, with the mean value increasing from 27.50 to 53.40 in the post-test. The use of aids such as balance balls, resistance bands, and PVC poles in the training model proved effective in improving the balance and strength aspects required in service techniques. Although requiring intensive supervision from the coach, the developed models successfully created a variety of exercises that could maintain athlete motivation and avoid boredom in the training process. This study provides a significant contribution to the development of sepaktakraw training methods, especially in improving team service skills.

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