Forehand Smash Badminton Training Models For U-13 And U-15 Athletes

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Abstract

Purpose – This research aims to provide variation of training and improve the results of smash badminton training especially smash accuracy. **Design/methodology/approach –** This research is research and development using the Borg and Gall model. The research site is at PB Jaya Raya Metland Jakarta with test models and test instruments in several clubs in the city and Bekasi district. **Findings –** There are three types of training models developed: footwork and shadow smash, plyometric and drill training models, and game patterns and situation models using Denatara BISA (Badminton Integrated Smash Accuracy) Smash Training Model.**Research limitations/implications –** The focus of this research is on the urgency of occurring minimal variation of the smash training model for athletes U-13 (age 11-12 years) and U-15 (age 13-14 years) according to the division of age groups listed in the PP PBSI regulations.**Practical implications –** With implications on the variable training model combined with technology-based test instruments can drive athletes in smash practice and can improve the results of smash training especially its accuracy.**Originality/value –** This research is relevant to the National Research Master Plan (RIRIN) related to the application of technological innovation especially in the field of education and sports.

Keywords: Forehand Smash; Training Model; Badminton; Smash Accuracy

A. Introduction

According to Law Number 11 of 2022, Article 1 point 12 states that achievement sports are sports that develop and develop athletes in a planned, systematic, integrated, tiered, sustainable manner through competition to achieve achievements with the support of sports science and technology (Republic of Indonesia, 2022) . Badminton is a sport that makes the Indonesian nation proud , because this is the sport that was able to win an Olympic gold medal, so this achievement must be maintained and improved in the future. The participation of the community, educational institutions and badminton associations is needed to develop and improve the quality of this sport. Badminton can become cultural and national and become an example for other sports in Indonesia. Badminton is also a sport that is popular with the public. The large number of badminton clubs spread throughout the country shows that badminton is very popular with the public. Government support and private participation in the development of badminton is very important and is supported by school and university programs as well as many badminton clubs which have been developed in the hope that replica performance will not be hampered. The main drivers of increasing performance

are "coaches and athletes", because the abilities of coaches and athletes cannot be separated as two sides of a valuable coin in the process of success. Talented and highly motivated athletes are very helpful in the process of achieving achievements. The duties and role of a coach are very complex because coaches must always adapt to the latest developments and always innovate. Creativity in coaching, in addition to achievement requirements. That's always a challenge.

Until now, badminton is still Indonesia's mainstay sport which is able to raise the nation's honor and dignity in the eyes of the world, because of the eight Olympic gold medals won by Indonesian badminton players from Alan Budi Kusuma and Susi Susanti in 1992 in Barcelona to Greysia Polii/Apriyani Rahayu at the Tokyo Olympics. 2020 is proof of the validity of badminton as a mainstay sport in this country. This achievement must continue to be maintained and improved because competition is getting tougher, along with the application of sports science . The application of sports technology and supporting system support such as nutritional sciences, sports analysts and other expert teams is a necessity.

Exercises must be arranged systematically, structured and measurable in accordance with training principles.

Apart from that, coaches also need to provide varied forms of training so that athletes do not get bored during the training process (Lubis et al., 2022) . Varying training models combined with the application of technology can be the key so that athletes can master the training material and achieve planned training goals (Dennis Ariadinata S et al., 2020) . Even though currently sports technology is no longer taboo in Indonesia, coaches are still unable to apply it consistently and effectively, especially in the sport of badminton (Ningrum et al., 2021) .

One of the hitting techniques that is a badminton player's weapon is the smash. This blow is identical as an attacking blow whose main aim is to kill the opponent. The characteristics of this blow are that it is hard, the speed of travel is fast, so it is difficult for the opponent to return. This punch requires aspects of leg muscle strength, shoulder arm, wrist flexibility and good accuracy (Denatara, 2020).

The most important thing in practicing smashes is the correct direction or accuracy of the blow (Lubis, 2021) . The results of interviews with the Jaya Raya Metland club coach show that the smash training carried out so far is still monotonous and lacks variety and does not utilize up to date sports technology . This research used a sample of athletes aged 11 – 14 years. The age of this sample was chosen because the smash technique requires maximum strength aspects, so at that age it is most appropriate to be used as a sample (Pusat et al., 2019) . Looking at the existing phenomena and the results of observations in the field (PB Jaya Raya Metland Jakarta), the author wants to carry out an R & D research to produce a smash punch training model product which is a development of an existing training model. PB Jaya Raya Metland itself was the choice considering that the training facilities and infrastructure as well as support from Metland, Tbk, such as the existence of athlete dormitories, nutritional requirements, and competition fees were adequate. The problem formulation in this research is how to use the smash training model to improve badminton play and how the development of the forehand smash training model can improve the performance of badminton players/athletes.

B. Methods

This research method uses quantitative research which aims to test hypotheses from data that has been collected in accordance with previous theories and concepts. Quantitative research is research carried out using an inductive deductive approach which departs from a theoretical framework, expert ideas.

or the researcher's understanding based on his experience which is then developed into problems and solutions which are proposed to obtain justification in the form of empirical data support in field. The research design used is "two groups pre-test-post-test design", namely a research design that has a pre-test before being given treatment and a post-test after being given treatment, so it can be known more accurately, because it can be compared with the one held before. given treatment (Sugiyono, 2007: 64) . The research design is as follows:
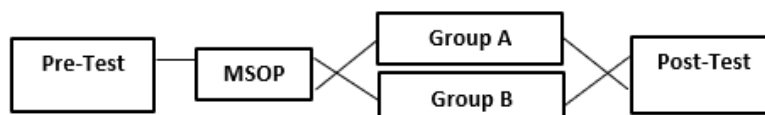

Chart 1. *Two Group Pre-test-Post-test Design*
(Sugiyono, 2007: 32)

With the following explanation:
MSOP   : *Matched Subject Ordinal Pairing.*
Pre-test : The initial test carried out a smash skill test with a manual instrument
Post-test : Final test by doing Smash skill test with *BISA (Badminton Integrated Smash Accuracy).*
The test is carried out after the testee receives model treatment DENATARA Smash Training Model for U-13 & U-15 Athletes

The population in this study was PB Jaya Raya Metland badminton athletes, totaling 30 people. Sampling in this research was carried out using purposive sampling . The criteria for determining this sample include: (1) attendance list of at least 75% (actively participating in training), (2) players are PB badminton athletes. Jaya Raya Metland , (3) aged 1 7 - 19 years, (4) male, (5) minimum training period of 6 months. Based on these criteria, 20 male athletes were met , then all samples obtained from purposive sampling were subjected to a pretest . All samples were pre-tested to determine the treatment group, their pre-test scores were ranked, then matched (paired) using the ABBA pattern, divided into two groups, 10 athletes each. The sampling technique used in this research is ordinal pairing. Before this stage, all samples were pre-tested, then the pre-test results were arranged according to rank or ranking.

The sample was divided into two groups, Group A was given the shadow training method and group B was treated with footwork training methods . The results of grouping based on ordinal pairing are as follows:

Group A	Group B
1	2
4	3
5	6
8	7
9	10
12	11
13	Etc

Table 1 . *Ordinal Pairings*

The test instrument used for initial measurements (pre-test) and final measurements (post-test) uses the Foot Exercise Series Test. This test was proposed by Tohar (1992: 202-203). This test has a validity of 0.98 and a reliability of 0.93. By using data analysis techniques in the form of instrument tests for validity and reliability tests, as well as prerequisite tests for normality tests, homogeneity tests and hypothesis tests.

C. Result and Discussion
Result

The subjects or participants used in this research were male badminton players aged 15-18 years at PB Jaya Raya Metland, a maximum of 20 male athletes. The test is carried out by each athlete for 30 seconds. The groups were divided into two, namely group A and group B. Group A was given treatment using the smash training model without BISA, while group B was given treatment using the Denatara BISA.

The pretest and posttest results from Group A, namely those using the smash training without BISA aged between 15 and 18 years in PB. Jaya Raya Metland can be seen in the form of a bar chart. The following are the bar chart results for group A which can be seen in Figure 1. Pretest and Posttest Bar Diagram for Group A.

Figure 1 . Group A *Pretest* and *Posttest* Bar Chart
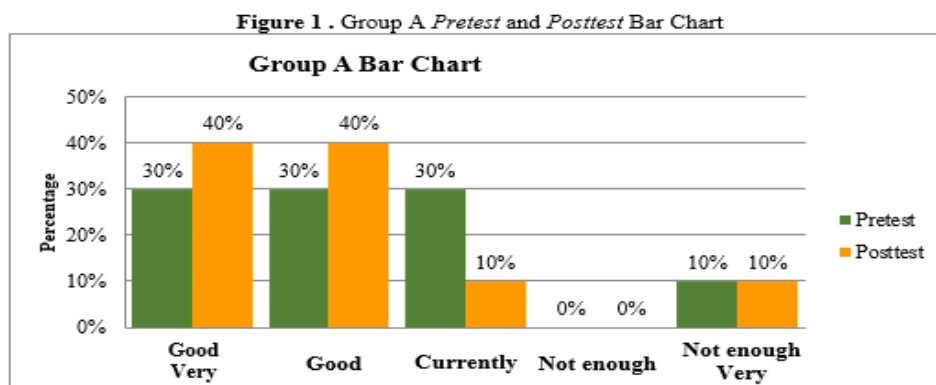
The pretest and posttest results from Group B are for aged between 17 and 19 years in PB. Jaya Raya Metland, can be seen in the form of a bar chart. The following are the bar chart results for group B which can be seen in Figure 2. Pretest and Posttest Bar Diagram for Group B.

Figure 2 . Group B *Pretest* and *Posttest* Bar Chart
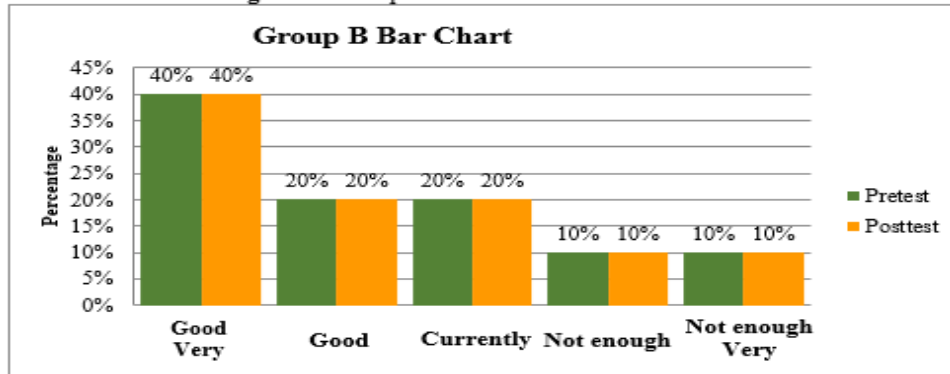
Normality test

This normality test calculation uses the Kolmogorov-Smirnov Z formula. The following is the output of the One Sample Kolmogorov-Smirnov Test with data processing using SPSS 16 software which can be seen in Table 2. Normality Test.

Table 2. Normality test

Group	p	Sig.	Information
Group A Pretest	0.989	0.05	Normal
Posttest Group A	0.914	0.05	Normal
Pretest Group B	0.960	0.05	Normal
Posttest Group B	0.953	0.05	Normal

The conditions for the normality test are that it is accepted if it is significant ≥ 0.05, meaning the data is normally distributed and rejected if it is significant < 0.05, meaning the data is not normally distributed. Based on the results from the table above. Looking at the p value on Category Pretest Group A, Posttest Group A, Pretest Group B, and Posttest Group B all of them have a value >0.05, meaning they are accepted. So the data has met the normality test and the data is normality test and the data is normally distributed .

Homogeneity Test

The results of the first homogeneity test are the Pretest Results, this research can be seen in Table 3. Pretest Homogeneity Test .

Table 3 . *Pretest* Homogeneity Test

Group	df1	df2	Sig.	Information
Pretest	1	18	.993	Homogeneous

Based on the output test of homogeneity of variance . It is significant based on the mean of the pretest results of 0.993, so the value is > 0.05, meaning it is accepted. The data has met the homogeneity test or the data is homogeneous. Furthermore, the results of the second homogeneity test are the posttest results , this research can be

seen in Table 4. Posttest Homogeneity Test

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Table 4 . *Posttest* Homogeneity Test

Group	df1	df2	Sig.	Information
Posttest	1	18	0,740	Homogeneous

Based on the output test of homogeneity of variance. It is significant based on the mean of the posttest results of 0.740 , so the value is > 0.05 means accepted. The data has met the homogeneity test or the data is homogeneous.

Hypothesis testing

The hypothesis in this study was tested using a paired t test and an independent t test using SPSS 16, the results of the hypothesis test are as follows:

Table 5 . T-test *Pre-Test* and *Post-Test Results* for Group A

Group	Average	t-test for Equality of means				
		t ht	t tb	Sig.	Difference	%
Pretest	20.0520	3,289	2.26	0.009	1,915	9.55%
Posttest	18.1370					

From the t-test results it can be seen that the t count is 3.289 and the t table is 2.26 (df 9) with a significance p value of 0.009. Because t count is 3.289 > t table 2.26 and the significance value is 0.009 < 0.05, this result shows that there is a significant difference. Thus the alternative hypothesis (Ha) which states "there is an influence of Denatara BISA Smash Training Model in badminton aged 11-14 years PB Jaya Raya Metland" is accepted.

So the comparison of the posttest between group A and group B via the Independent Sample t Test was used to test the third hypothesis which reads "The Denatara BISA Smash Training Method is more effective in improving smash forehand skills and accuracy in badminton aged 15-18 years PB Jaya Raya Metland" can be determined through the post-test between the groups A with group B. Based on the results of the analysis, the data in table 7 is obtained as follows.

Table 7 . *Post-* test t test for Group A with Group B

Group	Average	%	t-test for Equality of means			
			t ht	t tb	Sig.	Difference
A	18.1379	9.55%	0.742	2.10	0.468	0.2619
B	17.8760	10.69%				

From table 10 of the t test results above, it can be seen that the $_{calculated\ t}$ is 0.742 and the t $_{table}$ is 2.10 (df 18) with a significance p value of 0.448. Because t $_{count}$ is 0.742 < t $_{table}$ 2.10 and the significance value is 0.468 > 0.05, this result shows that there is no significant difference between post-test group A and post-test group B.

D. Conclusion

Based on the results of data analysis, description, testing of research results, and discussion, conclusions can be drawn, namely: Denatara BISA Smash Training Model on badminton Badminton Smash Forehand Skills aged 11-14 years PB Jaya Raya Metland, with t $_{count}$ 3.289 > t $_{table}$ 2.26 and a significance value of 0.009 < 0.05 with an influence of 9.55%. Thus, the results of this research have implications if athletes and coaches know that training using the Denatara BISA can influence the forehand smash in badminton, then this training can be used as a varied form of training.

E. Acknowledgments

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F. Conflict of Interest

This research has implications for smash training using the DENATARA BISA method which can have an effect on improving the quality of badminton forehand smashes, so this training can be used as a form of training variation, especially for U-13 and U-15 athletes.

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