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Game-based forehand smash training model development for Indonesian badminton athlete

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ABSTRACT

This study is aimed at developing training model for forehand smash skill in badminton. It applied Research and Development (R and D) and it adopted the method from Borg and Call featuring 10 steps to accomplish. To determine the level of significance of forehand smash skill, the study applied t-test. The data were calculated using t-test with a significance level of 0.05. The results show that the average value of pretest 18.74 and posttest average 21.00. To determine its significance level, this study compared t count and t value in the table. The result was t count = -5.888, df = 41 and significance values = 0.00 < 0.05. It means that there were significant differences concerning forehand smash skill before and after athlete used the training model.

Keywords: badminton, forehand, game, smash, training

INTRODUCTION

Badminton is a popular sport and it is the most favorable sport in many countries. It can be played by everyone ranging from children to older people, both male and female players. It can be performed in various type namely: single, double and triple as the most recent type developed. In general, it is played for various purposes including recreation, fitness and sport achievement. The first refers to ordinary performance to gain entertainment whereas the

second is performed with an additional goal that is to maintain health and physical fitness. The last goal applies to professional badminton player in any type of event or championship.

To achieve more in badminton, athletes must maintain several aspects. They need to maintain their physical and mental condition. In addition, technical and tactical skill must be harnessed to perform well in every single match they play. Technique mastery is paramount to every athlete. It determines their success in every match they play. Without good mastery of badminton techniques, it is very unlikely that they can perform well and win the game.

One of the techniques to master by players is the smashing technique. Good quality smash produces several aspects namely power and speed. These aspects determine the quality of smash shot performed by the players. Smash shot is an opportunity for players to gain points by executing smash toward their opponent's court. Good smash is hard to return since the opponents have no time to react to handle the stroke.

Badminton players need to learn hard to master smashing technique in order to perform well this stroke. However, in reality, many badminton coaches emphasize the power and speed in performing the stroke and sacrificing aspect of angle and steepness. Consequently, many badminton players lose their good direction to aim their opponent court when performing smash. This practice may improve players' smashing technique in terms of power and speed but it loses another quality of achieving angle and steepness. This, in turn, makes their smash shot are easy to anticipate and fail to execute good smash to win the point. This problem usually happens for single players in badminton.

The problem of low-quality smash performed by the player may occur because of several facts. It is very common that badminton coaches provide training model with the emphasis only on smashing technique drill. Their focus relies on the accuracy of shot result. This pattern of training may have negative impacts for athlete in their performance namely: (1) on the parts of players, they feel exhausted because they are required to perform powerful shot; (2) players are unable to perform proper basic badminton technique ; (3) the smash result is far beyond their expectation (4) smash variation in terms of angle and steepness is poor and it is easily handled by their opponents.

There is a need to solve the problem of athletes' low-quality of forehand smashing technique. Badminton coaches should build player skill in performing smashing technique and it should be the concern and primary focus for coaches. They need to assess players' need and seek to explore a possible way to boost and improve athletes' skill in performing forehand smash. A training model that incorporates accuracy and effectiveness in performing various techniques in badminton is needed. In addition, the training model should also provide joys and fun for the players in their training because their enthusiasm should be maintained during training practice. To achieve this training model, this study proposes a game-based forehand smash (hereafter GBFS).

MATERIAL AND METHOD

Material

In Indonesia, people have shown increasing awareness of the importance of sports activities. They understand that sports activities play a key role to achieve healthy body, spirit and discipline which are crucial in shaping the quality of human. Their attention to sports activities has increased. There are many choices for them to play sport and one of them is badminton. This sport has gained a lot of attention both from government and public since it meets the need Indonesian citizen ranging from children to older person, men and women.

Badminton remains popular in Indonesia because of several reasons. According to Subarjah (2004: 3), badminton is an individual game that can be done by one person against one person or two people against two people. To play this game, players use a racket as a bat and shuttlecock as an object to hit. On the part of the players, this game is easy to play because the racquet is light, the shuttlecock is easy to hit, it does not need a large field, it can

even be played inside or outside the room, and it can be played by anyone. Therefore, badminton games gain its popularity in Indonesia.

In sport education, the word exercise has been the focus of attention for coaches and athlete. Bomp (2009) states that exercise is a process in which athletes are prepared and developed to the fullest of their performance. An exercise can be defined as an effort to achieve the highest level of performance by improving the work efficiency of athlete bodies. Furthermore, Tangkudung and Puspitasari (2012) define exercise in terms of the characteristics of training which include a systematic process and practice, repeated experience, an increase in the amount. In this study, the training model process requires athlete to experience the exercise when they tested the effectiveness of the GBFS training model.

In any kind of sport, techniques need to be learned to increase skills and proficiency as an athlete. In badminton, several techniques need to be learnt by athlete continuously and systematically so that they can possess and develop them in their sport performance. In line with this (Badriah (2011) defines technical skill as the ability to carry out movement in the sport ranging from basic, complex, difficult and deceptive technique. Whereas Giriwijoyo and Dikdik Jafar Sidik (2012) view technical skills as the result of the learning process and movement drill training which are specifically harnessed to achieve a high quality of sport performance. It can be concluded that technical skills are mastery of movements in a particular branch of exercise which is the result of a special training process from simple, complex and difficult movements.

In badminton, mastery of basic technique is crucial for the players. It determines the movement of overall techniques and skills needed to perform by the players. The better the technique the lesser the energy spent in doing it. Its advantage is the prevention of injury occurrence among players during their training session. The perfect technique should be both biomechanically correct and physiologically efficient.

Motion skill refers to a person's ability to perform a particular task of movement in a particular sport. It requires athletes to be able to plan and learn from their previous drill and training. Widiastuti (2015) defines motion skill as movements that are in line with a particular pattern or forms and these movements require coordination and control of part or all of the body that can be achieved through the learning process.

Movement technique should be learned and developed to reach reflexes movement level on the part of the players. In Badminton, players are required to achieve this reflexes movement. They should be able to develop and produce various type of shots especially forehand smash technique and to respond to various stroke so that they can handle and manage their game for their victory. If they lack the ability to perform various types of movement, their opponents will be able to read and defeat their game.

Technical skill development is necessary to master by an athlete in badminton. According to Giriwijoyo and Dikdik Jafar Sidik (2012), athletes can learn a technical skill by coordinating nerve-muscle function to achieve accuracy and effectiveness in a particular movement. Furthermore, Badriah (2011) explained that technical skill should be given by the coach to their athlete because it has the following objectives:

1. Objective I: the formation of a precise and accurate movement.
2. Objective II: the formation of precise, accurate and fast movement.
3. Objective III: the formation of the precise, accurate, fast, and deceptive movement.

In initial technical training, athletes are required to achieve accuracy in their movement. Their accuracy refer to precise movement they make in playing badminton. This accuracy serves as an objective one (O1) in training. Next athletes should repeat the accuracy in their movement to achieve reflexes movement. This stage refers to objective two (O2) in training. Objective one and two are drilled and developed more with a gradual increase in speed to achieve better movement. Some excellent athletes can develop and perform deceptive

movement and it is considered as the highest objective in the badminton training. This refers to objective three (O3) in training.

Smash is a very powerful shot to offend the opponent's court. It is a technique featuring powerful hit performed by the players to gain points (Ministry of National Education, 2004). Smash technique should be strong and sharp and it requires the highest position on the part of the players to perform this shot. According to Poole (2009), smash can be a powerful weapon for players to collect points in a particular match. Since the ball is hit toward the opponent's court in a sharp and fast pace, the opponents usually have difficulty to react and they are unlikely to return the ball. The harder the smash the more difficult for opponents to handle the ball.

In performing smash shot, there is a slight difference between singles and doubles badminton type. For singles type, a smash shot must be hard and sharp and it must also directed far from the opponent's reach or to the middle of the opponent's body. As for doubles, they must be really hard and fast to make their opponent in a difficult circumstance to react and return the shuttle.

As one of the technique to attack opponent in badminton, smash shot has several characteristics. Alhusin (2007) describes smashing technique as a hard strike which is often performed by players in badminton games. Smash is always characterized by hard strike, fast pace of shuttlecock landing on the opponent side. It is performed by players to attack the opponents and put them in a difficult position to react and return the shuttlecock. In the same vein, Aksan (2012) defines forehand smash as hard, fast strike to hit shuttlecock to the opponent side. It requires physical coordination namely leg muscles, shoulders, arms and wrist flexibility. They should be harmonious to produce good movement to support smash strike.

Having delivered several experts' definition, it can be concluded that smash is a technique that should be mastered by the player to perform powerful shot both forehand and backhand with the purpose to attack the opponent and put them in difficult position to react and return the shuttlecock. It can be performed by either standing or jumping smash.

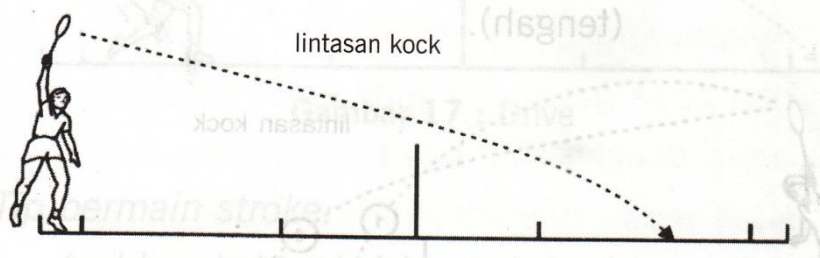


Figure. Smash hit track

Source: Agus Salim, *Buku Pintar Bulutangkis* (Bandung: Nuansa, 2008) p. 71

Games serve as a tool for children to explore their world and help them to recognize what is not known. In addition, children learn from games to do what they cannot do before. In education, Prasetyo (2016) explains that games are expected to boost students' motivation and to increase their interest in learning so that they can achieve learning outcomes. It goes without saying that games are important in human life. Human needs to play. Playing allows human to manage their mental balance by ensuring their stability and develop their control. In addition, playing can develop the speed of the human thinking process.

There are many benefits to playing activities for children. Pramono (2012) states that playing for children is beneficial for their physical-motoric aspects, intelligence and social-emotional. To gain those benefits, playing activities should be managed and planned well in a particular educational context. Without careful and thoughtful consideration, playing activities may not bring benefits for children to learn about their environment and prepare for higher education (Yuli Hartati, Priambodo, & Kristiyandaru, 2013).

Playing may offer many benefits for children in several aspects namely motoric, intelligence and social-emotional aspects. This three aspect should support each other and should not be separated. It is clear that each aspect should gain the opportunity to develop in an effort to prevent the gap or inequality of children growth.

Based on the previous description, it can be concluded that athlete should master techniques and movement in badminton. One of the techniques is forehand smash. Athletes have difficulty to be proficient in forehand smash skill. There is a need to develop training model which is effective and fun at the same time. This study tried to develop GBFS training model to meet the need of the athletes in mastering forehand smash.

METHOD

This study investigate the training model to improve athlete forehand smash. It applies research and development to achieve the objective of the study. Development means deepening and expanding existing knowledge. In general sense, development has the meaning of growth, change, systematically and sustainably. In learning context, development practice will lead to innovation if the material or product offers new and effective things. Research and development is a study that is not used to test the theory, but what is produced in the field is then revised until the results or products are satisfactory.

There are several definitions of research and development. Research and development according to Borg & Gall (1983) is a process used to develop and validate educational products. Whereas Gay et al (2012) explained that research and development is an attempt to develop an effective product that is used in educational context like schools and it is not aimed at testing the theory. Furthermore, Tangkudung (2015) explains that research and development are used to create new products and/or develop existing products based on the analysis of needs found in the field (observation, interviews and need analysis questionnaire). Its process is circular and it starts from the activity of analyzing, designing, evaluating and revising the product to the desired goal. It consists of a series that starts from the existence of a need in the educational field that requires problem solving using a certain product.

The research design used in this study follows research and development. The model has been applied by previous researchers. The model can also provide a framework for theory and research development. This, in turn, generates procedures and steps of research and development. This study adopted research and development model proposed by Borg & Gall (1983) which consists of 10 general steps, as described as follows: 1) collecting information; 2) planning, 3) developing preliminary form of product, 4) conducting Preliminary field testing, 5) revising main product; 6) main field testing, 7) operational product revision, 8) operational field testing, 9) final product revision, and 10) dissemination and implementation.

Based on the steps mentioned above, this study tried to realize the form of technical planning goals and types of activities to be carried out in each stage. If these steps of research and development are applied correctly, an educational product can be delivered. These steps are not the standard things that must be followed, the steps taken can be adjusted to the needs of a particular study.

Potential and Problem

This study determines the potential problem to solve that is to improve athlete poor skill in mastering forehand smash technique. This problem has been observed by the researcher through preliminary study.

Need Analysis

Data collection in this study includes reviewing various literature or literature studies relating to model concepts to be developed in accordance with the products to be made, referring to the needs analysis, taking into account expert review and field trials. There is a need to improve athlete skill in forehand smash technique.

Planning

In this stage, the initial product is a series of forehand smash training models with variations for children and beginner athlete. This training model took form in drill and rally methods or pairing with badminton partner. In designing and creating training models, the researcher consulted with colleagues or badminton coaches to design and create perfect product that is a training model to improve forehand smash.

Preliminary Form of Product Development

In this stage the researchers followed up the collected data from need analysis and experts suggestions. To improve athlete skill in forehand smash, this study designed and developed GBFS training model.

Main Field Testing

The purpose of this step is to determine whether the product of GBFS training model meets the objective that the study put forward.

Main Product Revision

This study collect data from expert for their review and suggestions to the product of GBFS training model. Based on experts' review, the product of training model design was revised. This stage allowed the researcher to improve GBFS training model.

Preliminary Field Testing

At this stage, the study assessed GBFS training model for small group. This field trials was conducted for three badminton clubs. The small group trial aimed to determine the quality and suitability of the product that is GBFS training models.

Revision of Product

In this stage, the researcher revised operational products of GBFS training model based on observation in its implementation to beginner athletes in the previous step that is preliminary field testing.

Operational Field Testing

A large group was used to test GBFS training model involving 6 badminton clubs. In this stage, the study tested the effectiveness of the model.

Final Product Revision

Based on expert's suggestion on operational field testing, GBFS training model was revised to achieve the final product.

Dissemination and Implementation

In this stage, the GBFS training model was disseminated through scientific meetings or journals. The researcher cooperates with publishers or government agencies to socialize products that have been developed.

RESULTS

Model Effectiveness

First Stage Result/ Small Group Test

GBFS training model that the researchers developed was evaluated by experts and it had been revised at stage one. After undergoing revision, GBFS training model was tested in a small group trial with one badminton club.

After conducting the small group trial evaluation, it can be concluded that GBFS training models can be applied. Several notes should be taken into consideration. The movement should start from standing to jumping position, training without the target should come first before training with the target, training from short distance to long distances, training from one target to several targets. These patterns are expected to boost and improve the athlete's forehand smash ability systematically.

Having undergone small group trial, the GBFS training model was revised in stage two. This second phase revision addresses the issue of usage not the content and substance of the GBFS training model. The target to achieve in this stage is to assess to what extent the training model can be implemented / can be applied in learning on a small group scale. After

undergoing stage two revision, the training model was officially considered eligible to be tested in a larger group.

Second Stage Test Result/ Large Group Test

Having tested in a small group scale, GBFS training model was revised. Taking into account the expert's judgment and suggestions, the researcher revised GBFS training model. There were 10 techniques of GBFS training model that had been revised. They featured several variation, combination and complexity movement for the revised model which were prepared to be tested in a larger group.

In a larger group trial test, there were 42 participants. They took a part in experiencing GBFS training model which had been revised previously.

Significance Test

After conducting a trial test in a large group, this study collected data from 42 research subjects on the effectiveness of GBFS training model. The data are shown in the following table:

1. t-test

a) Mean

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE-TEST	18.74	42	1.809	.279
	POST-TEST	21.00	42	2.036	.314

Based on the results of the output using SPSS, the mean before using the game-based forehand smash technique training was 18.4 and the mean after using the training model was 21.0. It can be seen that there is an increase of means after the athlete used GBFS training model.

b) Significance test

Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	PRE-TEST POST-TEST	-2.262	2.490	.384	-3.038	-1.486	-5.888	41	.000

After calculating significance test of differences with SPSS, the results of t-count = -5,888, df = 41 and significance values = 0.00 < 0.05. This result means that there are significant differences concerning athlete forehand smash performance before and after they used the GBFS training model. Based on the result it can be said that the GBFS training model had improved the athlete skills in this study.

DISCUSSION

Product Perfection/ completion

Having gained the result of the effectiveness test, this study shows that the GBFS technique training had improved athlete skills. Taking into account the advantages and disadvantages of the training model, this study offers suggestion to address for the improvement of GBFS training model. The suggestions are as follows:

- a) since the product is a training model, it is necessary to adjust the movement for research subject as well as the athlete participating in the training. Aligning the movement techniques is a must for athlete.
- b) repetition will be more helpful for an athlete in mastering badminton strike skills movements especially forehand smash.
- c) safety first. Taking into account factors during the exercise to maintain security and avoid injuries in exercise.

Product Discussion

This study develops GBFS training model which is aimed at helping coaches, trainer, lecturers and teachers to teach and deliver forehand smash technique for their athletes. This training model is expected to serve as a reference that is used to deliver material on forehand smash technique. It is in line with the need analysis of a particular training activities.

Smash is a technique in badminton with the purpose to attack the opponent and to gain points. This strike is divided into two namely forehand and backhand smash. This study discusses forehand smash and focuses on jumping smash type. The modelling exercises that this study addressed is on the accuracy and speed of the blow so that the power of the strike was not given too much attention. The exercises offered in the training model emphasized the principle of accuracy and speed of the blows.

Forehand smash with a clear and firm focus or target is more dangerous than powerful forehand smash with not focus in aiming a particular target. The former will be more difficult to deal with for the opponents. The latter is easier for the opponent to react and return the shuttlecock. By practicing the accuracy and precision of forehand smash, it is expected that the subject will have sufficient technical skills before attending a more intensive training.

This study has deployed several techniques to deliver in GBFS training model. Some examples of those techniques are as follows:

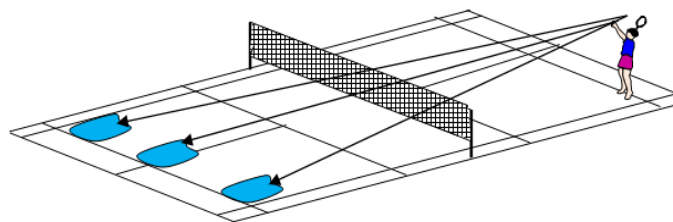


figure 1. standing smash with multiple targets

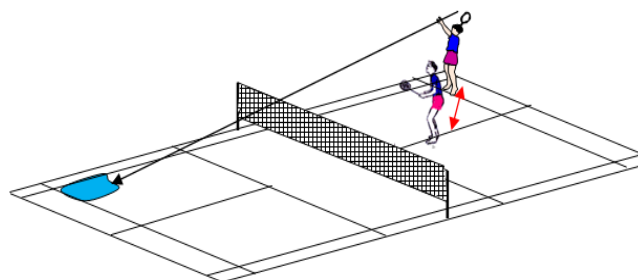


Figure 2. Jumping smash with a purpose to hit particular target

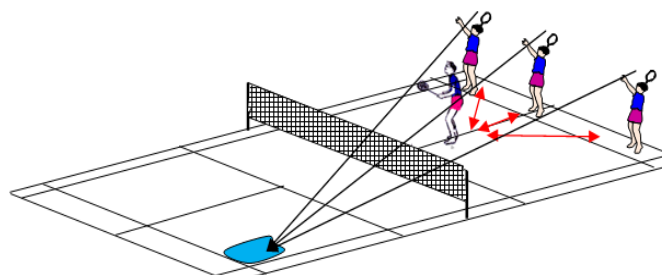


Figure 3. multiple standing smash position and heading toward a particular target

Product Novelty and Research Novelty

This study investigates GBFS training model. The material is compiled in the form of textbooks that can be easily learned by anyone because of its clear images and supporting clear narratives. Based on the results of the observations during training exercise sessions, there are some novelties that the researcher seeks to explore, namely:

- a) training model is developed based on the principle of systematization such as training from part to the whole method, from short distance to long distance, from standing to moving position, from one target to several targets, from simple movements to complex movements, from drill training (individual) to rally in pairs.
- b) In various movements exercise, this training model combines both practice skills and physical conditions especially hand and foot-eye coordination, balance, speed, agility and endurance.
- c) Athletes are more enthusiastic about doing the exercises because they are required to hit the target in every forehand smash they perform.
- d) The training model helped coaches to improve athlete mastery of forehand smash movements with a training model that emphasizes accuracy and precision when performing forehand smash using the actual atmosphere of the game like circumstance.

Product Limitation

This training model is aimed at providing practice for the forehand smash technique in Badminton. It combines both existing theories and the need analysis of the athlete in a real situation. The researcher has tried to do his best to design and produce the training model. However, this training model is far from perfect and it has several shortcomings and weaknesses that must be revised. The limitation and weaknesses of the training include:

- a) The research will be better if it is applied in a broader scope
- b) The training model used is far from perfect.
- c) Facilities and infrastructure used are still limited.
- d) The drilling practice requires a shuttlecock with a pretty good rate
- e) Explanation and rules in game-based forehand smash technique training are far from perfect.

CONCLUSION

This study investigated GBFS training model. It applied research and development method with several steps to accomplish. Based on the need analysis, the training model was initially developed. Several field trials and experts judgments contribute to the revised GBFS training model. Based on the data obtained from stages of research and development, it can be concluded that the product GBFS training model can be developed and applied in badminton training exercise to improve athlete skill in forehand smash.

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