

Engineering Short Services to Measure Shuttlecock Accuracy in the Badminton Game

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Keywords: Development, Test, Short service, Badminton

Abstract: In a double game, short service is important to determine the precision accuracy in the badminton practice or match. The purpose of this study is to determine the level of accuracy in the short service badminton game, especially novice athletes who are in Special Region Yogyakarta. This research method used research and development, which meant that this study was a research-oriented product. Techniques of data collections were observation. The subjects were novice badminton athletes in Special Region Yogyakarta aged of 15-16 years. The data were then analyzed using descriptive data analysis with quantitative percentage. Training process consisted of 20 players at DIY level and each player conducted 20 short services. The results showed that there was one respondent with extremely low accuracy conditions (5,0%), 4 respondents with lower category (20.0%), 13 respondents with the medium category (65%), 2 respondents with high category (10%) and no respondent with very high category (0%). The frequency of most respondents was medium category at grade interval $50.36 < X \leq 62.18$ with total of 13 respondents with percentage of 65%.

1 INTRODUCTION

Badminton is a sport that is preferred in the almost all levels of society. It can be used to gain a sense of achievement and entertainment. In addition to maintaining physical fitness, badminton can also increase the popularity of a country in the eye of the world, including Indonesia. For professional athletes, the ability to develop talent in playing badminton can bring achievements through competitions in local, national and even international levels.

Mechanical control of shots is very important and can be done by having long and short service techniques. Both services are considered to be the basic technique that are important in playing badminton and will often be used in defense or attack patterns. Therefore, it is important to give short service exercises for badminton players as early as possible, as it is applied in Badminton training conducted on children in badminton groups in Special Region Yogyakarta. Hopefully, one day, they can become reliable badminton athletes who make the country proud, and therefore, they need to get maximum training including short service.

Mastery of a serve that is precised and accurate will determine the quality of badminton players. "The basic technique is the mastery of basic badminton game that is required to be known by a badminton player and understood by each player in conducting badminton games". According to (Poole, 2011), "basic techniques that must be acknowledged by a badminton player are racket grip, service shot, overhead stroke, and underhand stroke." Short service will determine the pattern of the game to win the badminton games.

The main issue in the control of this service is the shuttlecock must be struck on the head. The serve is not easy to master especially for the novice players. They need to do exercises diligently, so that the muscles of their arms and legs are well-trained in performing a short service. Many mistakes when serving especially in a double game in part are sometimes caused by less precise strucks and the position of shuttlecock that is high and falling directly in front of the opponent, so that it is easy for the opponent to perform counterattack in the form of smash. Therefore, it is important to perform short service which is inaccessible by opposing players (Migley, 2000). As for the need to be noticed in playing badminton, the tools that is used are

paddle-shaped racquet and shuttlecock as batted-ball media.

Meanwhile, according to (Muhajir, 2007), badminton game can be played inside or outside the court, within the limits and the line length and width of the field. The game consists of multiple single match categories, or a mixture. The game is performed by shooting the shuttlecock to the opponent with the goal of getting the points value. The basic techniques one needs to learn at an early stage are holding a racket and servicing.

This study helps beginners in learning and training from the science that is taught as workout strategy to help to improve the performance of athletes in playing badminton. This research is often evaluated on the accuracy of the starting point to the ending point, or the distance of the object. Therefore, the accuracy of the landing cock is very important to note, as a benchmark, to get the points. This exercise pattern trains athletes to improve the movement of short service which is used as a major attack in the badminton games as an integrated exercise science with the aim at increasing the motoric movement.

2 METHOD

Determining research methods needs to be done by any researcher, because the method will determine the success of a way (technique) objectives to be achieved. According to (Surakhmad, 1989), "method is the primary means used to achieve a goal." The method used in this research was the design method development research (research and development), which meant that this study was a research oriented products. The subjects of research were the beginner badminton athletes in Yogyakarta. Previously, coaches first explained some of the rules related to the short service, namely:

- 1) The testee is standing in the service box to hold the racket and shuttlecock, and performing a maximum short service to cock target which is placed at waist,
- 2) Shuttlecock directions must be at across position and must pass through the room on top of the net and under the ropes mounted 40 cm above and parallel to the net,
- 3) Service is considered valid if the shuttlecock passes and falls to the place the target without touching the line, and
- 4) If shuttlecock fall above the line, the score provided that both feet relating to the floor and no movement pretend. Racket speed can be

slowed or accelerated but the movement must be performed continuously.

3 DATA COLLECTION

The data were collected through observations taken from 20 badminton players at Special Region of Yogyakarta, with the age of 15-16 years old, body weight of 40-60 kg, height of 155- 166 cm. In particular, the samples consisted of 8 athletes in the age of 15, and 12 athletes with the age of 16 years old. Among them, 13 male athletes and 7 female athletes were investigated. All athletes in the identification did not have an injury. They were asked to wear sports clothes and use their own rackets.

The research was carried out in the room, especially in the field of badminton. Then, the field and the nets are placed according to the standard size International Badminton Federation. Prior to research, the athletes warmed up in order to avoid injury and to familiarize themselves with the field. Players were instructed to perform normal short services. Each was performing 20 times. Related to the accuracy of short service, The results showed that there was one respondent with extremely low accuracy conditions (5,0%), 4 respondents with lower category (20.0%), 13 respondents with the medium category (65%), 2 respondents with high category (10%) and no respondent with very high category (0%). The frequency of most respondents was medium category at grade interval $50.36 < X \leq 62.18$ with total of 13 respondents with percentage of 65%.

4 DATA ANALYSIS

This study was performed on a descriptive approach. The percentage of quantitative was used in accordance to the technique sampling, which involved beginner athletes in Special Region Yogyakarta by reviewing factors of issues at short service. Raised variables became the main key that should be investigated, in a way to approach an individual or group of activities when taking action, until the data were collected.

The method used in this research was research and development method, which meant that this study was a research oriented products. (Sugiyono, 2011) stated that the research and development method is the of research methods used to produce a

particular product, and to test the efficacy of the product, starting from sampling, followed by testing short service which previously was exemplified in a teacher. The results were recorded, and the teacher could evaluate the advantages and disadvantages of athletes in the category of short service skills. The design is described as follows.

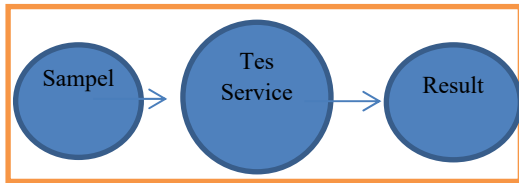


Figure 1: The study design one-shot case study (Arikunto, 2002)

5 RESULTS

The trial result of this research instrument was categorized in 3 ratings.

5.1 Tool Equipment

The tools used were: racket, shuttle cock, net, tape along the net with a minimum width of 5 cm, stretched 4.27 meters above the net with a height of 8 feet from the floor, two poles, stationery.

5.2 Implementation

a) The testee was standing in a groove on the pitch angle angled with targets that have been made to do service. b) Once there is a cue to start with a "yes", the testee is performing service on target 20 times. c) Shuttle cock must pass over the net and under the rope through the room and dropped on the target. d) The testee should try to keep the shuttle cock fall on good-value targets.

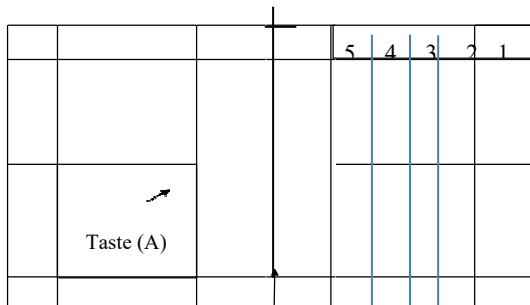


Figure 2: Field for Short Service

5.3 Target

The procedure was the testee should do the standing service to hold the racket and be ready to make a serve. The testee was standing right in place that had been marked A. A sign indicated where the testee was allowed to stand when serving. The testee conducted a series of short service movements repeatedly and gradually as many as 20 times to reach goals that have been determined. The testee was not allowed to move before the shuttlecock was falling on the floor or target.

The shuttlecock which fell on the target nearby and far right on target, was given score 1 which is very low, excellent category, and then gradually increased to score 2 low, good category, score 3 fair, moderate category, then score 4 high, low category, score 5 poor, very high category and service, which did not qualify or was far beyond the target was given the value of 0. When the shuttlecock fell on the line, it was given value in the higher grades.

5.4 Review

Review of short service target was a player service area which is located on the testee's diagonal player. The area bounded by the front line (short service line) was 6 plots with the size of each as follows.

1. Score 1 = 5
2. Score 2 = 4
3. Score 3 = 3
4. Score 4 = 2
5. Score 5 = 1
6. Score 6 = 0

A scale to determine the level of respondents' short service skills was as follow.

$$P = F / N \times 100\% \tag{1}$$

P.S.:

P = the percentage figure the number of subjects in a particular category

F = Frequency Subjects

N = total number of subjects

Table 1: Short Service Review Rules

Interval Scores	Category
$M + 1.5 SD < X$	Very High
$M + 0.5 SD < X \leq M + 1.5 SD$	High
$M - 0.5 SD < X \leq M + 0.5 SD$	Moderate
$M - 0.5 SD < X \leq M - 1.5 SD$	Low
$X \leq M - 1.5 SD$	Very low

Information :

M = Average (mean) score service

X = Score Service

SD = Standard deviation score service

Based on the descriptive results for the short service variable, the maximum score was 76.00 and 35.00 for minimum score of ideal average and deviation standard. The results of this research was to acknowledge the accuracy of the service with the ability level of short

Service which was divided into several categories, namely very high, high, medium, low and very low. The followings are the frequency distribution of the level of short service capabilities.

Table 2: Interval Class

Interval Class	Category	Frequency	Percentage
$X \leq 38.54$	Very low	1	5,0
$38.54 < X \leq 50.36$	Low	4	20,0
$50.36 < X \leq 62.18$	Moderate	13	65,0
$62.18 < X \leq 74.00$	High	2	10,0
$74.00 < X$	Very high	0	0
Total		20	100

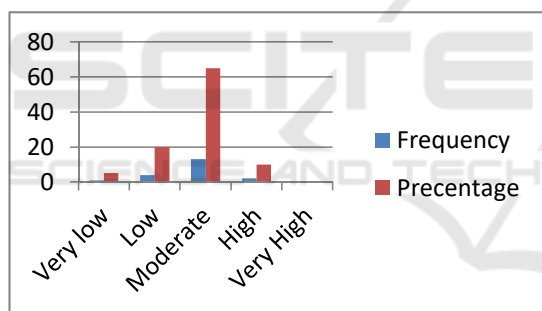


Figure 3: The frequency distribution of the level of short service capabilities

The results showed that there was one respondent with extremely low accuracy conditions (5,0%), 4 respondents with lower category (20.0%), 13 respondents with the medium category (65%), 2 respondents with high category (10%) and no respondent with very high category (0%). The frequency of most respondents was medium category at grade interval $50.36 < X \leq 62.18$ with total of 13 respondents with percentage of 65%

From the age category 15-16 years with the difference in the number of values, the result was as follow.

Table 3: The result based on age

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
15 Years	8	40,0	40,0	40,0
16 Years	12	60,0	60,0	100,0
Total	20	100,0	100,0	

From the gender category, the result was as follow.

Table 4: The result based on gender

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Male	13	65,0	65,0	65,0
Woman	7	35,0	35,0	100,0
Total	20	100,0	100,0	

6 DISCUSSION

This method is a new method to assess the level of accuracy based on the shuttlecock track later. It began to be developed in discussion exercises, so that coaches and athletes starters in a special region of Yogyakarta can optimize the shape of the main attack short service with the aim of earning points according to the target that has been set at the time of exercise with a high degree of difficulty in performing service badminton. Some players can reach the level of overall accuracy score. However, the majority of novice players still have to keep practicing to optimize the accuracy of the service that has been practiced.

7 CONCLUSION

This research method is used to assess the target trajectory of the shuttlecock. The effort to measure all beginner athletes in servicing was made in the form of obstacles, so that athletes with difficulty to perform service accuracy were determined by the coach. The role of coaches to athletes itself was to train the beginning motor movement and ending in the implementation of the service badminton accuracy in the field.

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