

Predictive Validity of Badminton Basic Skills Learning Outcome Instrument Test Based on Gender

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Abstract—This study aims to test the predictive validity of Badminton Basic Skill Learning Outcomes Instrument (BBSLOIT) based on gender. This research uses descriptive method for the age group of beginners of badminton school in Bandung as many as 50 students. The instrument used was BBSLOIT developed by Hambali (2015) consisting of high service, clear lob, drop shot, and smash. The validity method uses criterion related with predictive validity techniques. The criteria used are the ranking of results competing with the round robin system or the ranking of the results of half competition matches. The score of the BBSLOIT trial results and the ranking of the results of the matches are correlated using the Spearman rank order technique. The results of the analysis obtained the value of the challenged predictive validity coefficient between $r_{xy} = 0.60$ to $r_{xy} = 0.80$. The lowest predictive coefficient value is found in the high service sub-test in the group of male students with the validity coefficient $r_{xy} = 0.60$, while the highest validity coefficient is obtained in the high service sub-test for female students with the validity coefficient $r_{xy} = 0.80$. The results of the analysis show that BBSLOIT has good predictive validity, so it can be used to predict athlete's performance when playing badminton.

Keywords: *badminton basic skill learning outcome instrument test, predictive validity, round robin, Spearman rank order correlation*

I. INTRODUCTION

Sports skills and motoric skills measurement are the fundamental aspect of someone's performance measurement [1]. It is aimed to know how far a student or an athlete can master the basic technique after following the learning and training process, with the expectation that the teacher or coach can read the student's or the athlete's ability objectively [2]. This also points out to the goal of education in general, that there is a change in behavior that involves the cognitive, affective, and psychomotor aspect.

A change in behavior after learning process is known as the learning results. Learning results is the stage where students know very well their learning objective(s) in a certain period of time [3]. Therefore, in conducting a measurement of the students' learning results, a reliable measuring instrument is needed and it should be suitable with the purpose of measuring the learning results.

The measuring instrument used to measure learning results should meet the criteria as test instruments, which are; objective, proper, reliable, and valid. Objective means, an instrument of final test results should be able to picture the real condition, or in other words, the final test results instrument is able to judge the students' competence objectively. Proper means that an instrument that will be used in measuring learning results could gather reliable data that suits the goals. Besides, reliable and valid means that the learning outcomes instruments should have stability to measure what should be measured [4]. Another thing is that skills learning achievement test helps students to evaluate their performance in the basic skills and to give suggestions for improvement, and it also helps teacher or coach to measure and to evaluate the learning process affectivity that has been done [2].

In the context of sports, learning outcomes test is a test that has a purpose to measure students' or athletes' competence mastery in learning and training process of sports. For example, on the basic skill test of futsal [5], the basic skill test of playing badminton [2,3,6], skill test of shooting test in basketball [7]. Thus, it is necessary for a teacher or a coach to have a good instrument or learning outcomes test that the standard is set specifically for learning outcomes test in playing badminton, to see the players' competence mastering the basic badminton skills objectively.

The category model concept and the game analysis of badminton are divided in circle lob, drop shot, drive and smash skills. These are the standard hit and service as a hit in starting a rally in badminton [8]. The five basic techniques are divided into four preparation phase, which are; implementation phase, follow-through phase [9], and final results phase [2].

Those issues become the issues and problems focus which need to be solved to obtain the better measuring instrument, in the context of measuring psychomotor aspect. This also related to the predictive validity examination that will see the relationship between learning outcomes test in playing badminton through basic skills test of high service, clear lob, drop shot, and smash, with the results of playing badminton in half competition system.

That is why, the problem should be an important concern that the examination of learning outcomes test of playing badminton is done before being used with the real measurement. This is due to get the value scale of predictive validity on the instrument.

II. METHOD

A. Participants

Participants in this study were 50 FPOK UPI badminton school students. The sampling method aimed at inclusive subjects who were; (1) beginner athlete (11 to 13 years) no matter what the sex is, (2) registered and active in joining practice in a club or FPOK UPI badminton school, (3) have been following training for at least a year.

B. Procedure

To measure the instrument's amount of validity, a test was conducted for the participants that had been determined [10]. This test consisted of four test items. High service, clear lob, drop shot, and smash, and game performance while playing robin round. There were 50 participants in total (25 male athletes and 25 female athletes), who were chosen based on the theoretical assumptions that differentiate the number of subject or sample in objective test and performance test. Performance test sample trial that usually used is the limit sample [11].

C. Instrument

The instrument of this study is the Test and Non Test instrument, which is specifically, the learning outcomes test and the performance test [12]. The performance test is also included as a skills test which aimed to measure mastery of basic badminton playing skills of the students or the athletes after attending the performance test.

D. Data Analysis Technique

The analysis which was used in the examination of BBSLOIT is the criterion related validity or is the validity based on the criteria of predictive validity [1,13]. The criteria used in the BBSLOIT validity examination was the tournament participation or game performance, which were the set from scores in a half competition match, with the round robin technique [14,15]. One of the criteria in round robin game performance technique is that it should be with the sports that are individual [1].

On the basis of that, the criterion of round robin game performance was chosen with an assumption that badminton is included as sports that is individual. The data analysis technique used in the predictive validity was the rank order correlation, because the assumption was that the data being correlated in this validity examination was the ranking of the score results of playing performance with round robin technique or the half competition match [14,15]. The following is a formula used in the analysis of BBSLOIT predictive validity [16,17]:

$$r_{xy} = 1 - \frac{6 \sum D^2}{n(n^2 - 1)}$$

Where:

- $\sum D^2$ = Number of deviation of subjects' rank difference has already been squared
- n = Number of sample

III. RESULTS AND DISCUSSION

A. Results

TABLE I. RESULTS SUMMARY OF PREDICTIVE VALIDITY

Sub Test	Test Instrument	Predictive Validity (r_{xy})		
		Male	Female	Whole
High Service	BBSLOIT *	0.67	0.57	0.63
	RANGKING			
Clear Lob	BBSLOIT *	0.67	0.61	0.62
	RANGKING			
Drop shot	BBSLOIT *	0.62	0.57	0.61
	RANGKING			
Smash	BBSLOIT *	0.79	0.57	0.71
	RANGKING			
BBSLOIT whole	BBSLOIT *	0.88	0.68	0.81
	RANGKING			

Information: BBSLOIT = Badminton Basic Skill Learning Outcome Instrument Test,

Based on the results summary, the analysis of BBSLOIT predictive validity coefficient or the correlation results between scores ranking of the final assessment using BBSLOIT with the scores ranking from round robin game performance. The results in the criteria in table 1 were predictive validity coefficient scores ranged between $r_{xy} = 0.57$ until $r_{xy} = 0.88$. The lowest predictive validity coefficient score was from the high service sub test, drop shot, and smash on the female student's or athlete's group with the validity coefficient scale of $r_{xy} = 0.57$, while the highest validity coefficient scores was obtained from the whole BBSLOIT test on every male student or athlete with the validity coefficient scale of $r_{xy} = 0.88$.

Next, based on the above validity examination, it was approved that predictive validity on the male students were $r_{xy} = 0.67$ (high service), $r_{xy} = 0.67$ (clear lob), $r_{xy} = 0.62$ (drop shot), $r_{xy} = 0.79$ (smash) dan $r_{xy} = 0.88$ (BBSLOIT whole). Meanwhile the predictive validity of the female students or athletes were $r_{xy} = 0.57$ (high service), $r_{xy} = 0.61$ (clear lob), $r_{xy} = 0.57$ (drop shot), $r_{xy} = 0.57$ (smash) and $r_{xy} = 0.68$ (BBSLOIT whole). Meanwhile, on the mixed of male and female students, the predictive validity were $r_{xy} = 0.63$ (high service), $r_{xy} = 0.62$ (clear lob), $r_{xy} = 0.61$ (drop shot), $r_{xy} = 0.71$ (smash) and $r_{xy} = 0.81$ (BBSLOIT whole).

Based on the test analysis results of the male predictive validity, female predictive validity, or the mixed of both, in general, correlation coefficient obtained was above 0.50, which means the BBSLOIT that has been developed had a positive correlation with the criteria of play performance ranking in round robin. This also means that the higher score obtained by the students with the assessment using BSLOIT, then the student might have a good performance while playing and the student might be on the top rank. That is why, it can be

concluded that BBSLOIT had a high predictive validity. This could be because the coefficient validity scale obtained from each test and whole test had the coefficient validity scores ranged from $r_{xy} = 0.57$ up to $r_{xy} = 0.88$.

B. Discussion

The aim of this study is to examine the test instrument of basic skills test result in playing badminton which has developed. Badminton is a play that can be played by various age range, from children until adults, and that is why badminton is called a "lifetime sport" or "lifespan sport" [18]. Moreover, for the children aged 11 to 13 in the level of fostering badminton have the highest population compare to the other aged range groups. Also, in line with the other characteristics of physical-motor development, children showed the manipulative ability which is almost the same as the adults' play performance [18]. The children's age are also the peak of sports [19], and they also included in a play age group. In line with that, the test instrument developed in this research and development was able to give feedbacks about the skills level of the students of athletes who involved in the badminton training program and very beneficial for them to keep practicing in improving their play performance mastery.

Based on the analysis results, the predictive validity examination results of the male students, female students, or the mixed of both, it was approved that in general, the coefficient validity obtained was above 0.50. This means that BBSLOIT that had been developed had a positive correlation with the criteria of performance results ranking in round robin. This also means that the high score that the student can achieve in the BBSLOIT assessment could be mean that the student has a good play performance and he or she might be on the top rank. The research and development in this predictive validity examination supported the study that had been conducted by Lam & Zhang (2002) who developed an instrument to measure racket skills [2,15].

However, the previous instrument which focused on hit accuracy performance, the results obtain from this study focused on the sub section of movement and the final blow result that in BBSLOIT reflected the measurement in the real play. That is why, high coefficient scale in BBSLOIT predictive validity was the picture of the foundation to determine the students or athletes when playing in real game. The higher results obtained by using BBSLOIT, the better it will be in the real game. This might be because actually BBSLOIT measured the four important components that are in the badminton game; grip, stand, foot work, and stroke [3,6,9,20].

IV. CONCLUSION

Based on the examination results of predictive validity, it can be concluded that BBSLOIT had a good predictive validity

that could be caused by the task item in BBSLOIT can reflect the basic skills in playing badminton as if it is a real game.

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