



**THE INFLUENCE OF EXERCISE MODEL AND MOTIVATION  
TOWARDS FOREHAND TENNIS SKILL (EXPERIMENTAL STUDY  
ON EXERCISE MODEL AND ACHIEVEMENT MOTIVATION TO  
STUDENTS OF PJKR FKIP UNSIL TASIKMALAYA, INDONESIA)**

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**Abstract:**

Generally, this study aims to obtain a description of the difference between the influence of wall exercise model and machine exercise model, the interaction between forehand training model and achievement motivation, the difference between the influence of the wall exercise model and the machine exercise model for students who have high achievement motivation and the difference of the effect of the wall exercise model and the machine exercise model for students with low achievement motivation for tennis forehand skills. The method used in this research is experimental method with 2 x 2 factorial design, the population of all students of PJKR in 5th semester of FKIP Unsil Tasikmaya is 378 students, there are 115 samples with random sampling technique, while data collection technique is using test and measurement and the analytical technique is used by two-lane variance analysis (ANOVA) with 2 x 2 factorial design. There is a difference in learning outcomes of tennis forehand skills between machine exercise model and wall exercise model ( $F_o = 58,4820 > F_t = 4.11$ ). There is an interaction between the exercise model and the achievement motivation for the forehand tennis skills ( $F_o = 50, 5620 > F_t = 4.11$ ). There is a difference between forehand learning outcomes using machine exercise model and wall exercise model for highly motivated students ( $Q_o = 5.9032 > Q_t = 3.79$ ), there is a difference between forehand learning outcomes using machine model of exercise and wall exercise model towards low motivated student ( $Q_o = 22,54 > Q_t = 3,79$ ). It is suggested to teach groups of

students who have high achievements by using the machine or wall exercise model to improve their tennis forehand skills. Meanwhile, to teach students who have low achievement motivation is expected to use the wall exercise model.

**Keywords:** exercise model, achievement motivation, tennis forehand skill

## 1. Introduction

The development of sports in Indonesia is growing rapidly and received special attention from the government with the enactment of Law No. 5 in 2005 on Sport System. With the diversity of traits that exist in each sport, both in big cities and regions, it has a lot of benefits, such as; to stimulate the development of a better body, cultivate the relationship, expand the horizon of a person's perspective in navigating the life that is important for every individuals' development and can increase positive values such as sportsmanship, honesty, openness, and high discipline.

In today's modern life, humans cannot be separated from exercise activities, because exercise has become a need to restore the physical freshness of a person after daily activities. The level of public awareness of exercise is also considered as a necessity, it can be seen from the presence of fitness clubs that we can find them everywhere, as well as sports facilities from various sports that are widely used by the general public from various level.

The guidance and development of sports education is carried out through a learning process which is conducted by a qualified sports teacher / lecturer who has a certificate of competence and supported by adequate sports facilities. FKIP PJKR Unsil has responsibility for the development of educational sports in the campus environment. Faculty of Teacher Training and Education Department of Physical Education Health and Recreation Unsil Tasikmalaya (FKIP PJKR Unsil) is a sports education institution that provides knowledge, attitude, and skills to the students. The alumni of PJKR Unsil are expected to develop science in the field of sport and can be competent and professional teachers in the field of sports which one of them; they can be educators, trainers and builder of sports.

In the curriculum of PJKR Department, the tennis course is one of the practice subjects that become a main part of the Department of Recreation and Physical Health Education. The tennis subject consists of four basic techniques: Forehand, Backhand, Service, and Volley. Tennis skills are needed to be mastered by alumni of PJKR Department, besides it can be used to teach in school as well as a plus value that can be

made as an asset to open up a sports industry in term of tennis. Tennis course discusses about; 1) Ball handing, 2) Racket Handle, 3) Forehand Punches Movement 4) Backhand Punches Movement 5). Service Punch Movement 6) Volley Punch Movement 7) Rules of match and organizational system of the match (PELTI 2010).

Tennis is one of many sports that have a number of communities around the world and the development of tennis sports in the country is quite encouraging, it is shown by the development tennis courts in various agencies.

Tennis is also a very popular sport among various people, young and old, in killing their spare time to create association, pleasure, as well as the need to maintain body condition to stay healthy; it is done in accordance with their interests and needs, while some also use it as a sport achievement to make them and their country proud.

In tennis sport, there are groupings consisting of junior category, general category and veteran category. So for the tennis players, both old and young, are given the same opportunity to always be achievers.

To achieve maximum achievement, a tennis player must follow intensive and continuous training, whether in terms of technique, physical, tactics, mental psychology coaching and strategies to achieve victory. Throughout the world and especially in Indonesia, already many schools and tennis clubs can provide training methods which is oriented to train the future tennis athletes to produce achievements to bring the name of the Indonesia into the world.

Based on the assertions of the author, it is generally believed that in Tasikmalaya, the training sports is still not maximally done by not following the rules of continuous training, it can also be seen in the tennis sport. This phenomenon happens because the stages of sports coaching, especially tennis, has not been optimized, for example; at the stage of *pemassalan*, it is only ceremonially done by ignoring the integrated system, it means the activities of tennis *pemassalan* must be socialized and involved as many schoolchildren as can with emphasis on basic motion and then make an integrated competence.

Besides the coaching system, facilities, infrastructure and supporting environments also affect the performance of tennis players. Other important factors are the physical condition, mental readiness, preparation techniques and mastery play strategy. This is in accordance with the opinion of Bompa who said that there are four aspects of the exercise that need to be paid attention to, namely; physical preparation, technical preparation, mental / psychological preparation and preparation of tactics and strategies. The conquest of all aspects or factors mentioned above, in fact, is not owned by all players. There are tennis players who only master the technical skills, some of

them only have the mental readiness and some of them only have the readiness of tactics and strategies. Whereas, to achieve the optimal performance, the players must master the four strategies which is previously mentioned, therefore each of these factors requires attention and handling for achieving the desired goals.

In tennis, there are several basic punches that must be controlled by the players include forehand, backhand, serve, volley, lob, smash and other blow variations such as approach shot, drop shot and half volley. Due to the development of an increasingly modern era, it appears a new breakthrough tool to facilitate the practice of forehand punch that is by using the tool called the frontal engine. Before the blow-playing machine existed, it was all done by using the wall. This model of exercise will make it easier for students to practice forehand punches in tennis. Besides the exercise model, students also need motivation to be achievers in the tennis sport, especially on forehand technique.

Based on the background of the problem's description, it can be identified several problems related to this research, in order to make this study get a very clear direction and purpose, they are: Does the model of forehand exercise using the machine contributes towards the tennis forehand skills? Does the forehand exercise model on the wall contribute to the tennis forehand skills? How does the machine and wall forehand exercise model towards the tennis forehand skills for students with high achievement motivation? How does the machine and wall forehand model towards tennis forehand skills for students with low achievement motivation? Is there any interaction between the forehand training model and the achievement motivation for tennis forehand skills?

In order to avoid different interpretations and to get a clear picture, then the problem restrictions in a study is badly needed to make the problem research more focus into the real problem. Limitation of the problem in this study is based on the consideration of time, funds and other supporting facilities and infrastructure as a determinant factor in a study.

From the problem identification and various considerations that have been described, the writer can limit the problem in this research as follows: 1) model forehand training, 2) achievement motivation and 3) forehand tennis skill.

The forehand exercise model in this study is an independent variable which is limited to the model of machine and wall forehand exercise. The motivation of achievement is an attribute variable which is only limited to low and high category level. While the dependent variable is the tennis forehand skill, which is only limited to the results obtained through forehand skill tests.

## 2. Research Methods

The method used in this research is the experimental method with the 2 x 2 factorial design. The determination of design refers to Sudjana's opinion, ie experimental units grouped in cells in such a way that the experimental units inside the cell are relatively homogeneous and the number of experimental units inside the cell is as much as the number of research treatment.

The target population in this study were all regular male students of PJKR FKIP Unsil Tasikmalaya, while the inaccessible population was assigned to PJKR students in 5th semester of FKIP Unsil which consisting of 14 classes of PJKR study program (Each class consisted of 27 students so the total number of students of PJKR Department was 378 students).

In accordance with the research design, there are two kinds of data to be collected: (1) Data on tennis forehand skills, and (2) Achievement motivation data which is used to obtain forehand skill data and data on achievement motivation using test and measurement. They are used to measure forehand tennis skill with instrument made by researcher.

## 3. Tennis Forehand Skill

### a. Conceptual Definition

The tennis forehand skill is a sporting skill that performs a series of hand movement coordination movements, arm movements and shoulder rounds movement. The tennis forehand skill is a hard blow which is usually used as a player's main weapon, as the forehand blow is harder than a backhand blow.

### b. Operational Definition

The forehand blow is the first punch technique taught to someone who learns to play tennis or a beginner. Forehand is one of the most common groundstrokes as an initial blow technique taught to someone who is just learning to play tennis. A forehand punch is a hit that is hit to the side of the body where you are hold the racket. Besides, forehand is a dominant blow done by tennis players because this technique is able to give high confidence to tennis players. In doing forehand punches, there are several stages of implementation to be followed: (1) Grip, (2) Ready Position, (3) Implementation (Backswing), and (4) Follow Through. Thus, it can be argued that the operational definition of the tennis forehand skills is the student's ability to do the right tennis forehand.

**c. Instruments Grille**

The tennis forehand skill instruments are prepared by the researcher. The assessment has done by three judges, judges observation will be assisted by using video recording so that the result of judging / assessment will be more accurate.

How to appraise:

1. If the testee successfully performs all moves according to sub-indicator very well, then he/she gets 5 scores;
2. If the testee successfully performs all moves according to sub-indicator well, then he/she gets 4 scores;
3. If the testee successfully performs less-good moves according to sub-indicator, then he/she gets 3 scores;
4. If the testee performs all moves badly according to sub-indicator, then he/she gets 2 scores;
5. If the testee performs very bad moves according to sub-indicator, then he/she gets 1 score.

**Table 3:** Grid Instruments Assessment of Forehand Skill Tennis Field

Dimension	Indicator	Sub. Indicator	Assessment				
			SB	B	KB	TB	STB
Keterampilan Forehand Tennis Lapangan	Tahap Persiapan	Buka kaki selebar bahu dan lutut di tekuk Badan agak condong kedepan dan pandangan lurus ke depan Pegang raket					
	Tahap Pelaksanaan	Pindahkan berat tubuh ke depan Mengayun sejajar lapangan Jangan gerakkan pergelangan tangan Fokuskan pada bola Pukullah secepatnya					
	Tahap Lanjutan	Lanjutkan ayunan setelah pukulan Ayunan menyilang dan naik Arah raket menuju sasaran					
	Hasil	Jatuhnya bola					

**Table 4:** Name of the judges on tennis skills

Name of the Judges	Institutions
H. Gumilar Mulya, M.Pd	The lecturer of Tennis Subject in PJKR FKIP Unsil Tasikmalaya
H. Abdul Narlan, M.Pd.	Tennis coach of PELTI Kab. Tasikmalaya
Resty Agustriyani, S.Pd	The lecturer of Tennis subject PJKR FKIP Unsil Tasikmalaya

#### d. Calibration

The tests and measurements of tennis forehand skills are then calibrated by looking at the validity and reliability of the tests.

#### e. Test validity

The validity tests is performed by using expert validity, which will be consulted with 3 experts, in this case, to the experts who are good at test and measurement of forehand tennis skill fields.

### 3.1 Reliability

To see the reliability of the test, a re-test technique is performed to see the degree of consistency of the measuring instrument to be used. The test results of the instrument analyzed by using product moment correlation from Pearson, so it is obtained result that  $r_{xy} = 0,71$ . The full calculation can be seen in the following calculation;

**Table 5:** Test Instrument Data

No	Name	Test 1	Test 2	X <sup>2</sup>	Y <sup>2</sup>	XY
1	Dani	44	46	1936	2116	2024
2	Bambang	44	45	1936	2025	1980
3	Panji	42	42	1764	1764	1764
4	Hanna	42	43	1764	1849	1806
5	Sena	45	45	2025	2025	2025
6	Hendra	46	45	2116	2025	2070
7	Deni	42	41	1764	1681	1722
8	Hendrik	44	47	1936	2209	2068
9	Diat	44	43	1936	1849	1892
10	Avik	45	48	2025	2304	2160
Σ		438	445	19202	19847	19511

$$r = \frac{n \sum XY - \sum X \sum Y}{\sqrt{\{n \sum X^2 - (\sum X)^2\} \{n \sum Y^2 - (\sum Y)^2\}}}$$

$$r = \frac{10(16865) - (405)(416)}{\sqrt{\{10(16435) - (405)^2\} \{10(17328) - (416)^2\}}}$$

$$r = \frac{195110 - 194910}{\sqrt{176 \times 445}}$$

$$= \frac{200}{\sqrt{78320}}$$

$$= \frac{200}{279,86}$$

$$= 0,71$$

High Correlation

#### 4. Achievement Motivation Test

##### a. Conceptual Definition

Achievement motivation in this research is encouragement, both from inside and outside of students that will cause the desire in the success of doing tennis forehand skills. Generally, the motive encouragement in sport is used to do something of movement, including situations that encourage the emergence of power in the individual; influenced attitudes for the achievement of an expected goal. A student with high achievement motivation tends to demand him/herself to try harder, do better than ever before.

##### b. Operational Definition

The motivation in this research is the data are obtained from the responses to the questions on each item of instrument in the form of Likert skill, it is given to the students with the first indicator is a hope for success indicator combined with the indicators of achievement motivation. Therefore, the questionnaires consist of; 1). Intrinsic Motivation, and 2) Extrinsic Motivation. Based on these indicators, there are 10 items of intrinsic motivation questions and 5 extrinsic motivations that have been developed. The data from that sub-indicator are counted and the result shows a person's impulse in the high or low category to do their best.



### c. Instrument Grille

**Table 6:** Grades of Achievement Motivation

No	Indicators	Butir Item Positif	Butir Item Negatif	Jumlah Butir
<b>A. Intrinsic Motivation</b>				
1	Actively Participated			
2	Having the high courage			
3	Daring to take a risk			
4	Liking tough and challenging activities			
5	Responsible			
6	Being able to take over the task			
7	High spirited and disciplined			
8	Having a desire to be success and the best person			
9	Obedient to the trainers/teachers			
10	Having a fear of failure			
<b>B. Extrinsic Motivation</b>				
1	The influence of the environment			
2	Field condition			
3	Awards			
4	Teachers/coaches order			
5	Self-actualization			
<b>Total</b>				

### d. Calibration

The process of developing the instrument from achievement motivation begins with the preparation of the statement items as much as 50 items of statement with four choices of answers as measured by likert scale. Each statement comes with a choice of answers: SS (Strongly Agree), S (Agree), KS (Less Agree), TS (Disagree), and STS (Strongly Disagree). Next performs the instrument calibration by analyzing the result data from the test to determine its validity and reliability. The validity of the instrument of achievement motivation was analyzed by using Pearson product moment formula.

To test the validity of the questionnaire of achievement motivation is used the *internal criterion* which is to calculate the correlation coefficient of each item with the total factor value. Then the values of each factor are added by the total value of the questionnaire. The results achievement motivation instruments are then tested with the following steps;

### e. Validity items

to test the validity of the question items in the instrument test is correlated using *Product Moment Carl Person* formula, as follows: Sudjana (1994). The formulas required for the calculation are as follows:

$$r_{xy} = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{\{N \sum x^2 - (\sum x)^2\} \{N \sum y^2 - (\sum y)^2\}}}$$

$r_{xy}$  = koefisien korelasi;

$n$  = Jumlah sampel;

$X$  = skor butir;

$Y$  = skor total.

To determine the validity of the instrument is using a significant level of 0.05. The statement item is valid if the correlation coefficient  $r$  count  $>$   $t$  table.

### 4.1 Reliability

Instruments reliability of achievement motivation of the test items is performed by using Alpha-Chronbach formula, as follow:

$$r_{xx} = \left[ \frac{k}{k-1} \right] \left[ 1 - \frac{\sum \sigma_b^2}{\sigma_t^2} \right]$$

1. Number of valid items = 45
2. Number of variants items= 35,770
3. Total Variants = 5221
4. Alpha formula

$$\begin{aligned} r_{xx} &= \left[ \frac{k}{k-1} \right] \left[ 1 - \frac{\sum \sigma_b^2}{\sigma_t^2} \right] \\ &= \left[ \frac{44}{45-1} \right] \left[ 1 - \frac{35,770}{5221} \right] \\ &= 1.02 \times (1- 0.074) \\ &= 1.02 \times 0.925 \\ &= \mathbf{1,02} \end{aligned}$$

To analyze the data, this research is used two lane technique of variance analysis (ANOVA) with 2 x 2 factorial design at significant level  $\alpha = 0,05$ . Before performing the analysis of the variant, as a condition to meet the requirements of data analysis, the normality of the sample test is firstly tested with Liliefors, while to find the homogeneity variant of population is done by using Barlett test. Furthermore, if there is interaction (result of ANOVA calculation) then it is followed by Tukey test to figure out the level of significance F with significance level  $\alpha = 0.05$ .

## 5. Discussion

Based on the results of data analysis, it is obtained that the research hypothesis which states that there are differences in skills between machine models exercise with wall model exercise are acceptable. This means that the machine exercise is better in achieving the goal of learning forehand tennis skills compared to using the wall model exercise. In other words, the use of machine exercise model is better than the use of wall exercise model in the achievement of learning skills forehand tennis.

The second hypothesis proved that there is an interaction between the exercise model and the achievement motivation on the result of the students' tennis forehand skill of PJKR FKIP Uil. Thus it can be stated that, overall, there are interaction among the model of exercise and achievement motivation to the learning outcomes of tennis forehand skills.

The result of the 3rd hypothesis viewed from the average, the score of highly motivated students taught by using the machine exercise model is higher than the one which is using wall exercise model, but if the significant level is tested it shows there are differences significant between students who have high achievement motivation who are taught by using machine exercise model and wall exercise model in the tennis forehand skills.

While the fourth hypothesis testing shows that there is a significant difference between the low motivated students who are taught by using the machine exercise model and the wall exercise model in the tennis forehand skills. Based on these findings it can be concluded that the variance of tennis forehand results in low motivation students is influenced by the wall exercise model.

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