Conventional and Modern Learning with Different Motor Abilities Towards Increasing Consistency of Groundstroke

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Conventional and Modern Learning with Different Motor Abilities Towards Increasing Consistency of Groundstroke Forehand Drive in Tennis

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Abstract: **This research was aimed to determine the different effects of learning approach using conventional and modern way with low and high motor ability towards the increasing consistency of groundstroke drive forehand in tennis. Research population are freshman in the Department of Sport Coaching Education, State University of Malang 2016/2017 with no skill on tennis. Total sample respondent was 40 respondents taken with Purposive random Sampling. Samples divided into four treatment groups: group of conventional learning with high motor ability (a1b1), group of conventional learning with low motor ability (a1b2), group of modern learning with high motor ability (a2b1), and group of modern learning with low motor ability (a2b2). Grouping in this research's sample is done by ordinaly match pairing. Statistical analysis used anova factorial 2 x 2 with SPSS 23 program. The results show that: 1) There is a difference in the effect of learning approach conventional and modern way towards the increasing consistency of groundstroke forehand drive in tennis; 2) There is a different effect of learning with high and low motor ability towards the increasing consistency of groundstroke forehand drive in tennis; 3) There is an interaction between the learning approach and the motor ability level to the increasing consistency of groundstroke forehand drive in tennis.**

Keywords: learning approach, motor ability, tennis skill.

I. INTRODUCTION

Tennis sports are generally growing in popularity. However, there is a different tendency in some countries such as Asia and Latin America. Based on a survey, 70 million people who have tried to continuously learn tennis skills, 97% are not interested in keep learning and play tennis. This allows the cause of the decline number of people who are interested and choose to play the sport of tennis [18].

Therefore, this phenomenon needs to get a solution. One of the Organizations that encourages the innovation of tennis sports is the world tennis organization, i.e. International Tennis Federation (ITF). ITF sets out a message and advice aimed to teachers and coaches to adapt innovative teaching or learning methods with simplified learning procedures that modify the sport for the needs of new students. It is for the long-term sustainability [18] of a better tennis sport.

A common approach that is being use by teachers or lecturers in teaching tennis skills for the new learners is dominated by the teacher's command, with the stages of learning always using technique per part, repetition of movement according to instructions. This approach becomes an imitated approach and being a conventional approach to perform stages in learning a skill.

In the field of sports and physical education, especially in new learners, are teacher-centered or often called as traditional approaches [10]. Nevertheless, recently there is a tendency for a new movement of change that leads to a very different approach from the conventional (traditional) approach, i.e. an individual-centered approach to learning a skill, the approach to play or also called the modern approach [4]. The modern approach is believed to facilitate and provide a more profitable framework for someone who is just learning tennis.

The success of learning basic tennis skills is determined by several factors. Besides the learning approach used, it is also determined by the internal factors of the learner. One of the internal factors (besides motivation), which is predicted to influence success in studying new motion skills is the basic ability factor owned by someone to support effort in learning new skill called motor ability [5]. Motor ability is relatively sedentary trait, which underlie or support the appearance of motor skills. Although still in debates, research has provided strong support for genetic factors in determining the upper limit of individual potential in contributing to the achievement of the learned motor skills. This study aimed to determine the effects of learning approach using conventional and modern way with low and high motor ability towards the increasing consistency of groundstroke drive forehand in tennis.

II. METHOD

The research was conducted at the Faculty of Sport Science, State University of Malang. The series of research activities was done from September to December 2016. The research used factorial design 2x2. First variable is the learning approach (conventional and modern), while the second variable is the level of motor ability (low and high). The factorial design is as follows: conventional approach with high motor ability (a1b1), modern approach with high motor ability (a2b1), conventional approach with low motor ability (a1b2), and modern approach with low motor ability (a2b2).

A. Population and Sampling

Population in this research is freshmen of undergraduate program, in the Department of Education of Sport Coaching, State University of Malang, who have never learned basic tennis skill. The respondents was tested for their motor ability. The results of the motor skills test ranked from high to low score. Next, we randomly selected 20 respondents from each score group, thus total sample is 40 respondents. The amount of 40 is then separated into two relatively balanced groups with ordinal pair matching technique, so that two groups are obtained: the control group is the conventional approach learning group (N = 20, 10 high motor ability and 10 low motor ability) and the experimental group is the modern approach learning group (N = 20, 10 high motor ability and 10 low motor ability).

B. Data Collection

In accordance with the purpose of research, data collection techniques in the form of test techniques. For variable of increasing consistency on groundstroke forehand drive in tennis used the Hewitt tennis achievement test [2]. While the attribute variable is motor ability level used Barrow motor ability test [2].

C. Data Analysis

Data were analyzed through the stages of data description, test requirements analysis and hypothesis analysis. While the research data analysis techniques consisted of two parts, i.e. descriptive and inferential analysis. Descriptive analysis is done with the presentation of average data, standard deviation, minimum and maximum score. Test of analysis requirement is normality test using Shapiro Wilk test with $\alpha = 0.05\%$. We used it because this test is effective for small number of sample that less than 50 samples. Homogeneity test used Levene test as statistical significance reference test for variance equality. Inferential analysis used 2x2 factorial analysis of variance (ANOVA), with significance level (p-value) = 0.05% [13]. The analysis was processed by using SPSS 23 statistics program

III. RESULTS AND DISCUSSION

A. Motor Ability of Respondents on Groundstroke Forehand Drive in Tennis

The motor ability was tested before the learning and after the learning. The gain score descriptively show the gained ability after learning the skill (Table 1 and 2). The result show that the highest gained ability found on students with high level of motor ability that learned by modern approach. Otherwise, the lowest gained ability found on students with low motor ability that learned by conventional approach.

TABLE I. DESCRIPTIVE STATISTIC OF CONSISTENCY GROUNDSTROKE FOREHAND DRIVE

Sample \ Statistic		Mean	SD	Var	Min	Max
Conventional Approach	Pretest	4.78	1.77	3.12	1	8
	Posttest	12.25	4.11	16.88	4.5	19.5
	Gain	7.48	3.94	15.51	2	16
Modern Approach	Pretest	4.80	2.03	4.12	1,5	8
	Posttest	17.15	3.20	10.27	12	22
	Gain	12.35	2.83	8.03	8	19
High Motor Ability	Pretest	4.88	1.93	3.71	1.5	8
	Posttest	16.85	3.47	12.03	11.5	22
	Gain	11.98	3.28	10.75	7	19
Low Motor Ability	Pretest	4.70	1.87	3.51	1	8
	Posttest	12.55	4.25	18.02	4.5	20
	Gain	7.85	4.04	16.35	2	14

TABLE II. INTERACTION LEVEL OF MOTOR ABILITY

Level of Motor Ability	Descriptive Statistic	Learning Approach					
		Conventional (a_1)			*Modern (a_2)*		
		Pre test	Post test	Gain Score (a_1b_1)	Pre test	Post test	Gain Score (a_1b_2)
High (b_1)	Minimum	2	11.5	**7**	1.5	12	**9**
	Maximum	8	19.5	**16**	7.5	22	**19**
	Mean	4.8	15.2	**10.4**	4.95	18.5	**13.55**
	Standard Deviation	1.89	2.46	**2.73**	2.06	3.64	**3.12**
Low (b_2)	Minimum	1	4.5	**2**	1.5	13.5	**8**
	Maximum	7	14	**9**	8	20	**14**
	Mean	4.75	9.3	**4.55**	4.65	15.8	**11.15**
	Standard Deviation	1.74	3.19	**2.51**	2.09	2.08	**2**

B. Normality and Homogeneity Test

Normality test using Shapiro-Wilk method on the data distribution based on approach group, motor ability level and interaction between groups in each sample group obtained significance value (p-value) greater than 0.05. It indicates that increasing consistency on ground stroke forehand drive for beginner student, in all group of data, has normal distribution. Meanwhile, homogeneity test showed Levene's value of significance (p-value) greater than 0.05. It means that the interaction of treatments between study groups has a homogeneous variance.

C. Hypothesis Test

There is a significant difference (sig.< 0.05) in the increasing consistency of groundstroke forehand drive in tennis due to the learning approaches (Table 2). The difference in the increase was clarified the result of the average gain (consistency) of groundstroke forehand drive in tennis with the conventional approach learning group, i.e. 7.48, while in the modern approach group obtained a higher average score, i.e. 12.35 (Table 1).

There is also significant differences (sig.< 0.05) in increasing consistency of groundstroke forehand drive in tennis due to the motor ability (Table 2). The difference in the increase was clarified the result of the average gain (consistency) of groundstroke forehand drive in tennis. The learning group with high ability motor is 11.98, whereas in study group with low motor ability, gain an average score of 7.85 (Table 1).

At least, there is a significant interaction (sig.< 0.05) between the influences of learning approach (conventional and modern) with motor ability (high and low) to the difference of consistency improvement for the groundstroke forehand drive in tennis (Table 2). The difference in the increase is clarified the result of the average score for consistency of groundstroke forehand drive in tennis, in the learning group with conventional approach and high motor ability, i.e. 10.4, the learning group with modern approach and high motor ability is 13.55, whereas in the conventional learning group with low motor ability score 4.55, and in the modern learning group with low motor ability gain an average score increase of 11.15 (Table 2).

TABLE III. RESULTS OF FACTORIAL ANALYSIS OF VARIANCE

Source	Sum of Squares	df	Mean Square	F	Sig.
Approach	237.66	1	237.66	34.59	0.000
Motor Ability	170.16	1	170.16	24.76	0.000
Interaction of Approach and Motor Ability	29.756	1	29.76	4.33	0.045*
Error	247.38	36	6.87		
Total	4615.25	40			

Because there is an interaction between the learning approach and the motor ability level in influencing the learning outcomes of groundstroke forehand drive in tennis, it is necessary to do further test (post hoc test). Further test is needed to know the average increase of different learning outcomes in each sample group by using Least Square Difference (LSD) test.

From the 5% LSD test (Table 3), the highest consistency of groundstroke forehand drive in tennis was found in the learning group of modern approach with high motor ability, i.e. 13.55. This group is significantly different from the other groups, because the LSD test results show different notation. Whereas the lowest average consistency of groundstrokes forehand drive in tennis was found in study group of conventional approach with low motor ability with mean consistency 4.55.

TABLE IV. LSD TEST ON THE INTERACTION OF LEARNING APPROACH AND MOTOR ABILITY TOWARDS THE CONSISTENCY IMPROVEMENT OF GROUNDSTROKE FOREHAND DRIVE IN TENNIS

Treatment Combination	Average Improvement	Notation
Conventional Approach, High Motor Ability	10.4	b
Conventional Approach, Low Motor Ability	4.55	c
Modern Approach, High Motor Ability	13.55	a
Modern Approach, Low Motor Ability	11.15	b

Effect of Conventional and Modern Learning Approaches towards the Increasing Consistency of Groundstroke Forehand Drive in Tennis. Based on the result of 2 x 2 factorial ANOVA in Table 2, there are significantly higher influence differences, learning with the modern approach in improving the consistency level of groundstroke forehand drive for beginners than the conventional approach to the new students. The descriptive analysis also shows the average yield of higher increase in group of modern approach than the conventional group. So it can be argued that the use of a modern approach proves to provide more effective improvement than conventional approaches to increase the consistency of groundstroke forehand drive in tennis for individuals who are just learning tennis skills.

The modern learning approach is another name for the playing approach in the process of learning sports skills. Learning a modern approach has a higher effect than learning a conventional approach, since the modern approach in learning sports skills is part of cognitive learning phase. It provides an opportunity for the first learning individual to develop a more thorough understanding of all aspects of the game, while enhancing basic technique skills, increasing involvement in skills learning processes, as well as enhancing motivation and excitement [12].

Research by [17], also reported that the play approach effectively helps students to learn service skills in tennis. They also enjoys each stage of learning the service skills in tennis. The approach of play will give pleasure to the movement, eliminate the tedious learning of the game, and teach the principle of fair play between the learner and the teacher as well as the tactical thinking as an integral part of a game. This condition indicates that the play approach will motivate the learners well, to be more actively involved and increase arousal in skill learning activities, as well as pleasure and satisfaction that will stimulate interest to actively participate in learning.

Besides playing approach is a fun activity, it also because of the modifications to the modern approach will provide ease and lower technical complexity of the learned tennis skills. The modifications are such as the size of the field that is tailored to the objectives and stages of learning, e.g. minimized or narrowed field [9], the ball is a modified ball with various sizes of pressure [16], which will provide ease in controlling when playing.

The early stages of learning a skill for beginners is an important process for developing a positive impression of the new skills that being learned. To achieve maximum achievement in learning motor skills, student motivation factors must be raised first, establishing realistic but challenging learning objectives, guiding learners to focus on important aspects of the motor skills. So when the motivation and attention are properly considered in the learning stages, the learning process will lead to a pleasant experience, actively involved in processing all the learning information, so that good learning outcomes and expected goals will be more easily achieved [5].

Effect of Motor ability Level towards the Increasing Consistency of Groundstroke Forehand Drive in Tennis. Factorial analysis with ANOVA in Table 2 found that there was a significant difference in consistency of groundstroke forehand drive in tennis due to different level of motor ability, i.e. high and low motor ability. The determination of study group with low and high ability motor is based on motor ability test result from Barrow, where motor ability factors included in this test are: power factor on test item of standing broad jump, hand and shoulder coordination on softball throw test item, agility on zigzag run test items, hand eye coordination on wall pass test items, strength on medicine ball put test items, and speed on 60 yard dash test items. The characteristics of the motor ability factor of this test have are compatible with motor abilities that support the application of technical movements in tennis skills, i.e. coordination, power, strength and speed [8].

Based on the results of the analysis, it is generally shown that the level of motor ability owned by the beginners give significantly different effects in improving the consistency of groundstroke forehand drive learning results. The results supported by [5] which states that motor skills are the foundation of motor skills builders and play an important role in determining a person's capacity in performing motor skills including learning new skills; which means that a person with better motor ability will affect better capacity in performing a skill. In other type of sport, Rasidagic (2011: p.300-301) also reported that motor ability level variables (coordination ability, explosive power, velocity, strength, balance and accuracy) have a significant effect on skills outcomes in learning hand ball. Other research results by [11] showed that there is a significant relationship between motor ability level with smash skills in badminton students.

Interaction of Learning Approaches and Motor Ability towards the Increasing Consistency of Groundstroke Forehand Drive in Tennis. Factorial analysis with ANOVA in Table 2 showed an interaction between learning approach and motor ability level to increase consistency of groundstroke forehand drive in tennis of beginner student. So there are different effects on the learning approaches used to improve the learning outcomes of groundstrokes forehand drive, where the difference is also influenced by the level of motor skills (motor ability) of the beginners. It is understandable that each individual is assumed to possess a relatively similar motor abilities, but each individual also differs from one another to the proportion of strength and superiority of each of their capabilities.

Tennis is a game sport that has very complex technical characteristics due to the many variations of technical skills that must be mastered in order to play well in this game. Therefore, in learning the tennis skills well, one's biomotor capacity is required to adapt the relatively new task of motion in accordance with the complexity and specificity of the technical character of tennis skills. Tennis is a sport game that demands the capacity of a person's ability especially in the components of biomotor (strength), endurance, speed, coordination, flexibility, and power. Similarly, [1] stated that tennis is a sport that requires the development of special power components such as power endurance (PE), reactive power, acceleration power, and deceleration power. It appears that this characteristic corresponds to the element of motor abilities contained in Barrow's ability test.

Hence, it implies the practical importance of the relationship between ability and appearance of motor skills. If a person has high motor skills and an essential skill element and according to the learned skill characteristics, then the individual has the potential to do better than the others who have less important skill levels [5]. Therefore, the potential differences owned by individuals can be taken into consideration to provide environmental conditions that can stimulate the optimization of skill development in accordance with the high or low potential owned by beginners.

A large number of studies showed that different motivations also influence on concentration of attention [10] different states of motivation and mood will affect the scope of one's attention. Attention in learning a skill is an important factor because it is a person's general capacity to process information that leads individuals to the desired skill.

IV. CONCLUSION

There is a difference effect of conventional learning approaches with modern one on improving the consistency of groundstroke forehand drive in tennis. Modern study group showed an average increase in learning outcomes that are higher than the sample of conventional learning groups. There are also differences in the effect of learning on students who have high motor ability with low motor ability to improve consistency of groundstroke forehand drive tennis. The sample group with high motor ability showed a higher average increase than the low.

There is interaction effect between learning approaches (conventional and modern) with motor ability level (high and low) to increase consistency of groundstroke forehand drive tennis. Notation of the highest to the lowest successive learning group is respectively as follows: a sample of interaction between modern learning approach and high motor ability, interaction of modern learning approach with low motor ability, interaction of conventional learning approach with high motor ability, and interaction of conventional learning approach with low motor ability.

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