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Effect Of Mobile Learning-Based Teaching Materials Towards Learning Outcomes of Forehand Groundstroke In Tennis

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ABSTRACT

Background: There are no tennis teaching materials integrated with technology; so far, the teaching materials are only printed books. Many students feel bored quickly and find it difficult to understand those who only rely on books. Mobile learning is a learning model that utilizes information and communication technology. In this learning concept, mobile learning brings the benefits of the availability of teaching materials that can be accessed and the visualization of interesting material.

Methods: This study used an experimental design method in which 60 sports students were deliberately selected to be the research sample and divided into two groups, namely 30 students for the control group and 30 students for the experimental group. The instrument used to measure the learning outcomes of the forehand groundstroke is to hit the forehand groundstroke correctly over the net and enter the opponent's field where the target is in the form of numbers and are allowed to do a forehand groundstroke five times. The control and experimental groups used the same instrument to determine the tennis forehand groundstroke learning outcomes.

Results: The average learning outcomes of students' groundstroke forehand sports control group pre-test 6.23 and post-test 7.35, while the experimental group pre-test 6.77 and post-test 10.63. The experimental group that was given learning using mobile learning-based teaching materials got better grades and results than the control group that did not learn using mobile learning-based teaching materials.

Conclusion: It also shows an effect of mobile learning-based teaching materials on learning outcomes of forehand groundstroke in tennis. The use of mobile learning can improve the learning outcomes of the forehand groundstroke stroke.

Keywords: Mobile Learning, Teaching Materials, Tennis, Groundstroke, Forehand, Accuracy.

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INTRODUCTION

The development of Information and Communication Technology (ICT) has encouraged the creation of innovations in all fields. One of which is in education marked by the concept of mobile learning (m-learning). Mobile learning is a new paradigm in the world of education or the learning process. Since this learning model appears to respond to the rapid development of the world of information and communication technology lately, it cannot be denied that the mobile communication device is currently one of the devices attached to lecturers and college students' everyday lives. Mobile learning is a unique learning process because the students can interact and review learning information anytime and anywhere regardless of time and place limitations.

Due to the limited time that the lecturers have, which makes it sometimes difficult for them to meet up with the students in person in the class can be helped by mobile learning because it can be accessed at any time and anywhere because the mobile learning uses mobile technology devices that can bring convenience to every user in accessing the knowledge. The development of media in mobile learning can meet the criteria for supporting the objectives and content of learning, conformity to student characteristics, the efficiency of learning time, and ease to use by students (Ibrahim and Ishartiwi, 2017) [4].

The lecturers are required to make innovations in the learning process. In this case, in the tennis court course. The lecturers can use the correct method and design a creative and innovative learning media that utilizes a mobile set in the learning process or mobile learning. With the appropriate media, the implementation of tennis court lessons can functionate smoothly and effectively. The students' activeness more influences the fluency running of lessons in participating in the activities. The effectiveness of student learning in this activity will be influenced by the mutual interest between students and lecturers. As explained by (Husdarta 2009) [3], it is very strategic to achieve the expected goals by running and executing the educational process and learning activities.

According to (Supriatna 2015) [8], tennis is a sport that is usually played by two players or two pairs of two players. Each player uses a racket to hit a rubber ball. Furthermore, (Irawadi 2009) [5] states that the tennis court is also a sport that can be played by any group, from small children to retired employees, both male, and female, or people who are physically perfect or otherwise, regardless of the status or caste. The success of a tennis player in playing or competing depends on one's ability to hit. A tennis player will more easily win a match if they have a good shot (O'Donoghue & Ingram, 2001) [6]. One of the basic techniques to master in the game of tennis is groundstrokes. A groundstroke is a shot that is made to a ball after it has bounced off the court. This stroke has two types: forehand groundstroke and backhand groundstroke (Brown, 2001) [2]. The forehand is the most basic and easiest shot to teach in tennis. According to Permana, the forehand is a stroke that swings from behind the body to the front, and the front of the racket or the palm of our hand is facing the ball.

However, the field data analysis results show that sports students have difficulty performing the basic techniques of forehand groundstroke in tennis. They often make mistakes when hitting, which is when dealing with the racket with the ball and when hitting the ball incorrectly so that the ball does not cross the net or goes out of the field. Therefore, the lecturers can use more attractive teaching materials by designing creative and innovative learning media that utilizes a mobile set in the learning process or mobile learning. *"Mobile learning is the newest learning platform and based on the rapid rate of proliferation of mobile technology throughout the world is expected to grow at a rapid rate"* (Alrasheedi & Capretz, 2015) [1]. Based on the characteristics and motion structure, a tennis court is very suitable to be designed and developed as an educational medium because it has many variations in the structure of motion in one basic technique of tennis strokes. The number of variations and motion structures will enrich students' motion treasury in learning the tennis court. The students' motion treasury directly impacts student learning activities in the teaching and learning process.

On the contrary, in its practice, it is found that the teaching and learning process, especially in the learning of tennis court course, still uses the old media, like textbooks (printed books). Moreover, lecturers are also still demonstrating the movement directly. Therefore, it can be seen that no renewal or innovation is adapted to the current developments that utilize and develop a mobile device that can be used as a suitable learning medium. Moreover, the lecturers lack creativity in providing tennis movements or techniques that arouse students' enthusiasm and motivation to have a movement desire. Due to that problem, this research was conducted to know the effect of mobile learning-based teaching materials on forehand groundstroke learning outcomes in tennis. From the results of this study, it is hoped that it can be used as a reference in the application of mobile learning, not only in tennis learning material but also in other materials.

RESEARCH METHODS

The research used an experimental method, with a control group of 30 people and an experimental group of 30 people. The Ordinal Pairing System is used to determine the control and experimental groups. The experimental and control groups were determined by means of ordinal pairing, which were ranked based on the pretest results.

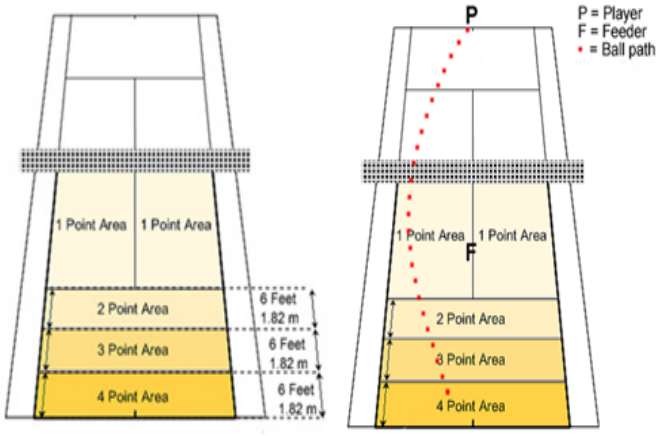
The untreated control group and the experimental group that was given treatment used mobile learning-based teaching materials. The data collection techniques in this study use tests and measurements consisting of the initial test (pretest); then, after the pretest is carried out, research sports students are given treatment through the learning process using mobile learning-based teaching materials this step is done. It is followed by a final test (post-test). The final post-test test was conducted to determine students'

final results by using mobile learning-based teaching materials, which were conducted 14 times on the learning outcomes of tennis forehand groundstroke.

Before conducting the pretest, students were given an example of the basic techniques of tennis forehand groundstroke, which they would practice one by one. Then they were provided direction regarding the stages in conducting the pretest. The pretest was conducted to determine the initial results of the basic techniques of tennis forehand groundstroke in students. The pretest was given to obtain preliminary data before being given treatment. After obtaining the initial data, students were given learning treatment using tennis mobile learning-based teaching materials for 14 meetings for the experimental group.

In contrast, the control group was not given the treatment. Furthermore, students do a post-test, which is the final data collection. A post-test was conducted to measure the students' ability to understand tennis forehand groundstroke after learning using mobile learning-based teaching materials.

The assessment of learning outcomes for groundstroke forehand is as follows: students are allowed to do forehand groundstroke five times, while in the assessment, the score to be taken is a ball that crosses the net, which in the field has already been given numbers. This score is then added up on the opportunity to perform the forehand groundstroke technique. The score is then added up on the opportunity to perform the forehand groundstroke technique.



Picture 1: Assessment of learning outcomes for groundstroke forehand

The results showed an increase in students' groundstroke forehand learning outcomes with the use of mobile learning-based teaching materials. Mobile learning teaching materials are related to basic tennis techniques, including good racket grip and repeated racket swing correctly. Mobile learning-based teaching materials contain basic techniques for playing tennis equipped with complete video images and are very easy to understand before practicing directly in the field. It makes the students more focused and interested in improving their basic movements and not hesitating to make movements according to what they see in the mobile learning-based teaching materials.

RESULT

The research method used was the experimental pretest-posttest control group method and the experiment with teaching materials based on Mobile-Learning, and this is the result :

CONTROL GROUP	GROUNDSTROKE FOREHNAD									
	PRETEST					POSTEST				
	1	2	3	4	5	1	2	3	4	5
X1	1	1	1	0	1	2	2	2	3	1
X2	0	2	1	1	0	2	2	2	1	0
X3	2	0	3	0	0	2	2	3	2	1
X4	0	2	1	0	0	2	2	3	3	2
X5	2	3	0	0	1	2	2	0	1	2
X6	0	2	0	0	1	2	3	3	4	1
X7	0	0	0	1	2	3	3	2	1	2
X8	0	2	2	0	1	2	2	3	1	1
X9	1	3	0	1	1	2	3	0	2	1
X10	0	2	0	3	0	1	2	2	3	1
X11	1	0	0	1	2	0	2	2	1	2
X12	1	3	0	2	1	1	3	3	0	1
X13	1	1	0	1	2	1	2	0	0	2
X14	2	1	2	0	1	2	2	2	2	3
X15	2	1	0	1	2	2	2	3	2	1
X16	0	0	3	2	2	2	2	2	3	2
X17	0	0	2	2	1	2	3	2	3	3
X18	1	1	0	0	2	3	2	2	3	1
X19	2	2	0	0	1	2	2	3	3	4
X20	0	2	1	2	1	2	3	3	2	3
X21	0	1	2	1	2	2	2	2	3	1
X22	0	2	1	0	0	2	2	3	0	2
X23	0	2	2	1	0	2	1	2	2	3
X24	2	0	1	1	2	3	3	2	1	2
X25	0	1	2	0	0	2	2	3	1	1
X26	0	2	2	0	2	2	3	0	2	2
X27	0	2	1	0	2	3	2	2	3	1
X28	0	0	1	0	1	2	2	3	4	1
X29	0	1	0	1	1	3	2	2	3	1
X30	2	1	0	0	1	2	2	3	4	1

EXPSERIMENT GROUP	GROUNDSTROKE FOREHNAD									
	PRETEST					POSTEST				
	1	2	3	4	5	1	2	3	4	5
X1	1	1	1	2	1	3	2	3	3	3
X2	1	2	1	3	2	4	3	3	4	2
X3	0	0	2	1	1	4	4	4	3	3
X4	2	1	0	2	1	4	3	3	4	2
X5	1	1	2	0	0	4	4	4	2	2
X6	1	2	0	2	3	4	2	2	3	3
X7	0	1	0	2	1	4	3	4	3	3
X8	1	1	1	1	0	4	3	3	4	2
X9	1	0	2	1	2	4	2	3	4	3
X10	1	0	2	2	3	4	3	3	4	2
X11	0	1	2	0	0	4	4	4	3	3
X12	2	0	2	2	2	1	3	3	0	3
X13	2	1	1	2	0	4	4	4	3	3
X14	1	0	2	2	1	4	3	3	4	2
X15	2	2	2	1	0	4	4	4	2	4
X16	1	1	0	2	2	2	2	2	3	3
X17	1	2	1	2	2	4	3	4	2	3
X18	2	1	2	0	1	4	4	2	4	2
X19	0	1	0	2	1	4	4	2	3	2
X20	2	1	1	1	0	3	2	3	4	2
X21	1	0	0	1	2	3	4	2	4	4
X22	2	0	2	0	1	4	4	3	4	3
X23	1	1	2	3	2	4	2	3	3	4
X24	2	0	2	2	2	3	2	2	1	2
X25	2	1	1	2	0	3	2	3	3	2
X26	1	0	2	2	1	2	3	0	3	2
X27	2	2	2	1	0	3	2	3	4	3
X28	1	1	0	2	2	4	2	3	4	2
X29	1	2	1	2	2	4	4	3	3	2
X30	2	1	2	0	1	4	4	3	4	2

Picture 2: Table Result Pretest, Posttest Control, and Experiment Group

In table 1, the following are descriptive statistics of the pretest-posttest results of the control group:

	Mode	Median	Standard Deviation	The slope of the curve	Average
Pretest	4,43	6,17	14,58	0,16	6,23
Posttest	5,56	6,95	9,91	0,21	7,35

Table 1: Pretest and Posttest Control Group

In table 1, it can be seen that the learning outcomes of the groundstroke forehand were 60 subjects with a mean of 6.23 being the pretest control group, while the mean of 7.35 was the control group post-test. In table 2, the following are the results of the pretest-posttest test in the experimental group:

	Mode	Median	Standard Deviation	The Slope of the curve	Average
Pretest	4,75	6,17	14,41	0,14	6,77
Posttest	9,27	10,28	25,17	0,54	10,63

Table 2: Pretest and Posttest of the Experiment Group

It can be seen that the average pretest score of the experimental group is 6.77, and the post-test score is 10.63. Therefore, it can be concluded that the post-test

experimental group experienced a significant increase using teaching materials based on Mobile-Learning.

After the pretest and post-test data were obtained, the normality and homogeneity tests were then carried out as a requirement for data analysis. After being tested, it turns out that the data is usually distributed and homogeneous; after the data is declared normal and homogeneous, then a hypothesis is submitted using the statistical "t-test" test criteria for Ho if t-count ≥ t-table (1-a), and Ho reject if t-count ≤ t-table (1-a), where t (1-a) is t contained in the t distribution table with DK = n1 + n2-2 and probability (1-a), the t-count obtained is 15.42. In contrast, t (0.95) (60) = 1.771 is obtained from the t-table distribution tablet. From the calculations, it can be concluded that there is a significant difference between the experimental group and the control group. So mobile-learning-based teaching materials have a significant effect on learning outcomes for tennis groundstroke forehand.

DISCUSSION

The results showed that the score of sports students treated by using mobile learning-based teaching materials is higher than those not treated by using it.

The results of the experimental group pretest showed that the students got the highest score of 14 and the lowest score was 3, and the pretest average of the experimental group was 6.77. After learning using mobile learning-based teaching materials for eight weeks with a frequency of learning two times a week, the entire study sample was subjected to a final or post-test test. It turns out that there is an average increase of 3.86 so that the post-test mean of the experimental group's tennis forehand groundstroke learning outcomes becomes 10.63.

The results of the pretest control group students' groundstroke forehand ability had the highest score of 10, the lowest score was 2, and the average pretest of the control group was 6.23. Meanwhile, the control group post-test was 11, and the lowest score was 3, and the average score was 6.65.

In a previous study conducted by Sigit Vebrianto Susilo and Tri Ferga Prasetyo in 2020, the research title Android-Based 2D Mobile Learning Teaching Materials: A Technology-Based Learning in Facing the Industrial Revolution 4.0.

The results obtained from the trial show that the lowest percentage in each aspect is the learning aspect of 82.11% and 84.24% in both categories. Based on the study results, students stated that the application needed to add more interesting content such as learning videos, GIFs (moving animations) so that the application became more interesting and could attract students' interest. On the other hand, the highest percentage in each aspect is software engineering aspect 89.83% and 90.91% with very good category. Students stated that this mobile learning application was an innovation used in the classroom learning process based on the study results. The application was easy to use (Sigit Vebrianto Susilo, Tri Ferga Prasetyo, 2020) [7].

In line with the research results above, the use of android-based mobile learning can increase student learning activities and motivation. Furthermore, by using mobile learning, students can learn whenever and wherever they are not fixated on the place and time where students carry out activities.

The improvement and progress of this research occur in every meeting because every time a researcher moves to provide an example and input to each student, it is easier for them to imitate good and correct groundstroke forehand movements and correct movements made by students. For example, in the first meeting, many students still experienced difficulties due to the wrong racket grip and basic motion, making it difficult for them to do the forehand groundstroke technique. Still, it was easier for students to get the correct technique with learning from time to time.

So that there is a higher increase in learning outcomes in the experimental group who are given learning using mobile learning teaching materials than the control group who are not given learning using mobile learning. For example, the pretest result of the experimental group averaged 6.77 and post-test 10.63 an increase of 3.96, while the results of the control group pretest an average of 6.23 and post-test 7.35 and an increase of 1.12.

CONCLUSION

Based on the research results of the effect of mobile learning-based teaching materials on the learning outcomes of groundstroke forehand in tennis, the following conclusions can be drawn: mobile learning-based teaching materials improve the learning outcomes of sports students for groundstroke forehand tennis, this can be seen from the increase in the average pretest and post-test groups. The experiment was 6.77, up to 10.63, while the average pretest and post-test in the control group had an increase but was small, namely 6.23, up to 7.35. So it can be concluded that learning using mobile learning-based teaching materials has a significant effect on learning outcomes for tennis groundstroke forehand.

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