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The Effectiveness of a Scientific Approach in Improving Bottom Passing Ability in Volleyball Games at the Vuttisat Vittanuson School in Thailand

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Abstract

Learning Volleyball games at the Vuttisat Vittanuson school in Thailand, especially in lower passing ability, still needs to improve. The physical education teacher utilizes conventional methods, resulting in unproductive learning outcomes. This research aims to determine the effectiveness of a scientific approach on students' Volleyball passing abilities. This research is quasi-experimental research with a Pre-test and Post-test Group research design. The population in this study were Mattayom 5 students and 30 Vuttisat Vittanuson School students. The instrument in this research is a Volleyball passing ability test. The research results showed that, based on the pre-test and post-test scores, there was a significant increase. It is comprehended that there is a distinction in the positive influence of applying a scientific approach to students' passing ability in Volleyball.

Keywords: *Scientific Approach, Learning Outcomes, Lower Passing, Volleyball*

INTRODUCTION

Education is a learning process between teachers and students to produce beneficial results. Physical education teachers should master and understand the effective basic concepts of physical education learning models (Pranopik, 2017). Various groups must recognize physical education as a component of education. Games and sports generally explain the learning process for physical education, sports, and health (Putra et al., 2021). Accomplishing conventional learning material with teacher-centered learning will cause boredom and less

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learning. Physical education teachers who provide subject matter should turn to modern and attractive learning by providing more varied and contemporary strategies and materials. Improving learning strategies and materials will support students' abilities, especially in understanding learning material (Widarto et al., 2012; Manik & Sihotang, 2015).

Learning through a scientific approach is a learning process designed in such a way as to encourage students to actively construct concepts, laws, or principles through the stages of observing (to identify or find problems), formulating problems, proposing or formulating hypotheses, collecting data using various techniques, analyzing data, drawing conclusions and learning objectives with a scientific approach. The advantages of the learning process approach include (1) increasing intellectual abilities, especially high-order thinking skills; (2) developing students' ability to solve problems systematically; (3) creating learning-supportive circumstances; (4) obtaining high learning outcomes; and (5) training students in communicating, writing scientific articles, and;(6) developing student character (Machin, 2014). By applying a scientific approach through problem-solving teaching approach, it is expected that students will be able to understand and perform sports, specifically Volleyball sport, correctly following the application of a scientific approach through a problem-solving teaching approach (Pratama et al., 2020)

Volleyball is a team sport played by two teams of 6 players; each team competes to reach 25 points first. Volleyball is played on a specific field, separated by a net. This game can be indoors or outdoors (Hidayat & Pulung Riyano, 2018). Volleyball recognizes several basic techniques, including passing over, under-passing, serving, blocking, and smashing. These techniques are necessary and crucial for students to master basic techniques. Beutelstahl (2005) stated that to play Volleyball sufficiently; the individual should master controlling the ball first. Furthermore, underpassing is the first basic technique taught to students or beginner players. Overhead passing is a technique a volleyball player uses to direct the ball to a place or teammate.

Underpassing is a crucial technique for playing Volleyball (Martono et al., 2017). The uses of under-passing are for receiving a service ball and receiving a smash ball or attack from the rival, retrieving the ball after a block occurs or the ball bounces off the net, saving a ball that bounces far outside the playing field, or retrieving a low ball. The ball's

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sudden arrival or passing failed to pass through the net, so less-than-perfect games cannot be played well (Saputra & Gusniar, 2019).

Several studies on the scientific approach to student volleyball learning outcomes stated that learning Volleyball in schools is material in the scientific approach. The curriculum is designed creatively to achieve the learning objectives

((Nugraha, 2017; Pratama et al., 2020). It is crucial for a learning approach/model to improve student learning outcomes in big ball games, especially Volleyball (Samsudin & Rahman, 2016).

Based on the results of field observations carried out by the author on students at the Vuttisat Vittayanuson School, Koh Lanta Noi, Thailand. Students need to improve their learning abilities and motivation. Their bottom passing ability still needs to improve to improve the volleyball game. They often failed to return the ball to the rival's area. The importance of a scientific approach in learning Volleyball provides students with scientific-based thinking patterns. They learn starting from observation, formulating questions from observations, trying or implementing, associating, and communicating orally and in writing, or by demonstrating skills. (Nugraha, 2017; Hartanti, Rachman, & Tuasikal, 2020). Previous studies have not applied a scientific approach to learning Volleyball passing, so the research strategically shaped students' cognitive domain through scientific steps (Dharmawan et al., 2023; Burhanuddin et al., 2022).

Based on the results of observations, researchers use a scientific approach to apply a learning process designed so that students actively construct concepts, laws, or principles. The stages are observing, formulating problems, proposing or formulating hypotheses, collecting data using various techniques, analyzing data, concluding, and communicating the concepts, laws, or principles discovered. The advantage of the research is that it gives students insight into knowing, understanding, and practicing studies scientifically.

METHOD

The research method researchers utilize is experimentation, which aims to find the effect of certain treatments on others under controlled conditions (Sugiyono, 2016). The experiment operated a pre-experimental design. Experimental research of pre-experiments has various designs. The use of this design is adjusted to the research aspects and the

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main problem to be expressed. The author uses A group pre-test and post-test design. This research activity provides an initial test (pre-test) before and after treatment and then gives a final test (post-test) as a research design. The research design can be observed in Table 1 below:

Table 1. Research Design *One Group Pre-test – Post-test Design*

Research Design		
Pre-test	Treatment	Postest
O1	X	O2

The research population is 649 students at Vuttisat Vittayanuson School, Koh Lanta Noi, Thailand. In contrast, the research sample of Noitu students in class Mattayom 5 at Vuttisat Vittayanuson School Koh Lanta, Thailand, is 30 students. The Volleyball passing test measures Volleyball bottom passing ability (Nurhasan, 2007). The procedures for carrying out the Volleyball passing test are displayed in Figure 1 as follows:

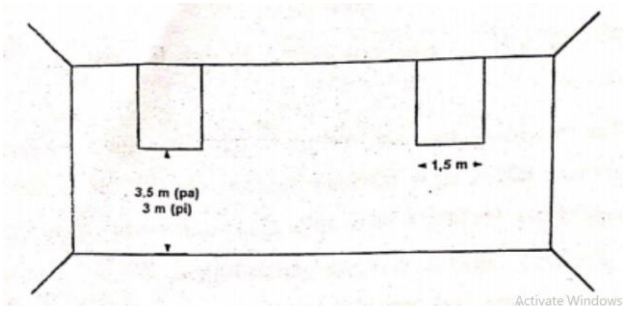

Figure 1. Volleyball Passing Test Field

The data analysis technique used to analyze the difference between pre-test and post-test scores is the paired sample test (Gozali, 2013)

RESULT

This research was conducted using a One-Group Pre-test and Post-test Design. The initial test (pre-test) was to determine the initial situation, and a final test (post-test) was given to determine the effect of the environment-based model on student learning outcomes after treatment.

Research results from 30 samples taken at the Vuttisat Vittanuson School, Koh Lanta Krabi, Thailand. From the pre-test data, the highest data was obtained at 22.12; the

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lowest data was 33.27; the mean was 28.501, and the standard deviation was 2.33. The post-test data was obtained; the highest data was 20.30, the lowest data was 29.10, the mean was 25.538, and the standard deviation was 2.07. Details of the research results can be regarded in Table 2.

Table 2. Post-test Result Data for Volleyball Underpassing Test

No.	Information	Result
1.	Samples (N)	30
2.	The Highest Score	22,12
3.	Lowes Score	33.27
4.	Average	28,50
5.	Mode	27,9
6.	Range	11,15
.7.	Standard Deviation	2,33

Table 3. Pre-test Result Data for Volleyball Underpassing Test

No.	Information	Result
1.	Samples (N)	30
2.	The Highest Score	20,30
3.	Lowes Score	29,20
4.	Average	25,53
5.	Mode	24,69
.6.	Range	8.8
7.	Standard Deviation	2,07

Table 4. Pre-test Result Data for Volleyball Underpassing Test

H	N	NTG	NTR	*M*	P
Post-	30	22,12	33,27	28,50	2,96
Pre-test	30	20,30	29,10	25,53	

The comparison of the pre-test and post-test results can be seen from the pre-test: the highest underpassing ability had a time of 22.12, and the lowest underpassing ability had a time of 33.27. Data from the post-test results of the highest underpassing ability with a time of 20.30 and the lowest underpassing ability with a time of 29.10 and the mean or

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average of the pre-test was 18.501, and the post-test was 25.538 so the difference in the mean of the pre-test and post-test was 2.963.

Table 5. List of Improved Pre-test and Post-test Passing Results

H	N	PBT	PBTr	M	P	Mo	SD
Post-	30	22,12	33,27	28,50	2,96	27,9	2,33
Pre-test	30	20,30	29,10	25,53		24,69	2,07

Comparative data on the results of the pre-test and post-test of Volleyball passing with a total of N of 30 stated that the pre-test results for the highest underpassing with a time of 22.12 and the lowest underpassing with a time of 33.27, with a mean of 28.50, mode pre-test data was 27.99 and the standard deviation was 2.33. The highest lower post-test result data had a time of 20.30, and the lowest underpassing had a time of 29.10 with a mean of 25.53. The post-test data mode was 24.9, and the standard deviation was 2.07, so an increase in the pre-test and post-test mean was 2. 96.

Tabel 5. Hypothesis Test List

H	N	M	∑d	∑xd	$\sum d^2$
Posttest	30	28.50	71	0,2	10,452
Pretest	30	25,53			

Based on the hypothesis testing table, it can be noticed that the results of the experimental group's pre-test data were with an average of 28.501, and the experimental group's post-test data with an average of 25.538 and it is also known that Σd was 71, Σxd was 0.2, and ΣXd2 was 10.4524. Data from statistical calculations "t-test" obtained a result of 23.6 while the T table was 1.70, which was obtained from the T distribution table with dk (30-2)= 28 and a confidence level of 95% (α=0.05), listed in the table. Hypothesis testing criteria accept Ha if Tcount> Ttable(1-α) and reject H0 if Tcount<Ttable(1-α). The value of count (23.6) > Table (1.70) means that there is a significant difference between the pre-test and post-test. The H0 hypothesis is rejected, and the Ha hypothesis is accepted. Ha, Noitu's statement, "There is an influence of the Scientific Approach on the lower Passing Learning outcomes of Mattayom class students at Vuttisat Vitayanuson School Koh Lanta Krabi, Thailand."

DISCUSSION

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This research aims to determine the improvement of basic underpassing technique abilities for Mattayom 5 class students at the Vuttisat Vittanuson school using a scientific approach. The research results showed a significant improvement in the basic technique of underpassing with a scientific approach in Mattayom 5 class students at the Vuttisat Vittanuson school. This is proven by the calculated t-value in the test, the difference between the pre-test and the post-test in that the underpass ability is greater than the t-table so that the decision that can be taken is that there is an increase in the ability of the basic underpass technique of Volleyball with a scientific approach for Mattayom 5 class students in Vuttisat Vittanuson school.

Hypothesis testing shows a significant increase in bottom passing ability before and after being treated with a scientific approach. By providing a scientific approach learning model, basic passing techniques in Volleyball can be improved by 28.153%. It is based on the average increase from before being treated to after being treated with the 3 3 form of playing.

Sports activities at school are a vehicle for channeling students' interests and talents (Winasa, 2021). According to Rasyono (2019), playing is the most important element in children's daily lives to maintain happiness for children. The desire to move is accommodated through play to satisfy the children's needs (Basuki, 2017). Following this theory, underpassing technique is align with this theory. In essence, the ability to use basic passing techniques in volleyball games is provided through a scientific approach learning model, stimulating students to move and carry out the practice of underpassing actively (Hananingsih & Imran, 2020). As a result, the underpass ability of Mattayom students at the Vuttisat Vittanuson school increased by 28.153% from before (Irianto, 2018).

Providing a scientific approach improves basic passing techniques, as proven by the research that has been carried out. The results after being given a scientific approach have increased; this was proven by the test results of one of the students before being given the playing form. The pre-test with a score of 9 after being given treatment in the playing form increased with a post-test score of 15 (Mustafa & Winarno, 2020).

Underpassing is the most basic technique in Volleyball, which aims to provide a pass to a teammate. A team can play a good volleyball game with good underpassing technique skills. Various techniques are learned in training so that achievements can be achieved. Underpassing training with a scientific approach was chosen as the learning

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method, significantly increasing underpassing ability (Mashud, 2015). The scientific approach learning model stimulates students to move actively because they feel happy. Students unconsciously carry out underpassing movements, and it turns out that their ability in underpassing techniques has increased after some time.

CONCLUSION

The scientific approach provides a new paradigm in physical education learning, especially in the material of passing under Volleyball. Student's learning stages start from observing the passing learning process, asking questions based on findings from observations, practicing basic underpassing techniques with various variations and combinations, associating from various learning experiences the results of trying and communicating the results of underpassing learning by demonstrating in front of teachers and other students. Applying a scientific approach to learning volleyball underpassing has significantly contributed to Mattayom 5th-grade students at the Vuttisat Vitayanuson School, Koh Lanta Krabi, Thailand.

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