



Development of the play-based model on volleyball basic techniques for junior high school

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ABSTRACT

This study aims to examine the effectiveness of the volleyball play-based learning model in improving the volleyball basic skills of junior high school students. The research used an experimental design with the posttest-only control group. There were 80 participants who were randomly divided into two groups. The basic volleyball skills test were used to collect the data after the treatment. The normality test and then independent t-test were used to analyze the posttest data of both groups. The results of the normality test showed that the posttest data of the experimental and control group was normally distributed and it can be continued with other data analyses. The study indicates a significant difference in the mean scores of basic volleyball skills posttest between experimental and control groups ($t=10,211$, $p=0.000$). Thus, the mean score of basic volleyball skills of the experimental group is higher than the control group. So, it means that the playing-based volleyball learning model is more effective in improving the basic volleyball skills of junior high school students. Further study should be tried to develop another basic skill in volleyball games.

Keywords: learning, model, basic skills, volleyball

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INTRODUCTION

Physical education is a learning process through physical activities designing to improve physical fitness, develop motor skills, knowledge and behavior of healthy and active living, sportsmanship, and emotional intelligence. The learning environment is carefully arranged to encourage the growth and development of all students, the physical, psychomotor, cognitive, and affective domains (Arfa et al., 2020). Physical education is a complex and interesting subject. For many students, physical education subjects are eagerly awaited. Physical education should be carried out not only as a fun activity but also educate and be able to train the child's body. Physical education learning should be able to develop students' physical, psychomotor, cognitive and affective domains. Therefore, good physical education learning must at least meet the criteria of being effective, efficient, and attractive. The foundation of the curriculum is a very important foundation for a process in physical education. There are four foundations used in curriculum development, namely: philosophical/juridical, psychological, sociological, and organizational foundations (Samsudin, 2014). Therefore, it is necessary to adjust physical activity in similar physical education to the training of certain skills through modification. Choosing learning methods in the learning environment surely considers the characteristics of students.

Most of the students are novice learners in Physical and Sports Activities (PSA) which they do not master the rules, despite the fact that they already practiced it previously. This finding assumes that there are facts that hinder volleyball learning in ordinary classroom situations which highlight and explain students' difficulties in learning volleyball (Basile et al., 2019). Other characteristics of junior high school children are namely (1) boys and girls with about 44 to 60 inches (111.8-152.4 cm) tall and weigh 44 to 90 pounds (20.00-40.8kg), (2) slow growth, (3) the body beginning to elongate, (4) cephalocaudal (head to toe) and proximodistal (center to periphery) development; (5) growing psychological development for girls comparing to boys and different interests at the end of this period; (6) Firmly hand preference with about preferring to the right hand (85%) and about preferring the left hand (15%); (7) Slow reaction time; (8) full of energy but low levels of endurance; and (9) the visual perception mechanism by the end of this period (Gallahue, 2006).

Movement skills have stages in the process. This is reinforced by the opinion which states that childhood and adolescence are essential periods for learning, mainly due to the rapid neurodevelopment and greater neural plasticity in which experience in this period alters the architecture (Silva et al., 2017) which means that childhood and adolescence is an important period for learning, as rapid neurodevelopment and greater neural plasticity for strengthening synapses. Knowing the different skills can help in planning lessons and practicing the experience as a starting point for performance assessment. Movement learning is the study of the processes associated with the acquisition of motion, the refinement of motor skills and the variables that help or hinder the acquisition of these movements. The field related to movement learning is motion control, which focuses on the study of nerves, physical aspects and behavior of human movement. Skilled motor behavior on the brain learning both crease after the load force peak and reached its peak to control. Flanagan et al., (2003) confirmed that skilled motor behavior depends on the brain learning and the strength of the load to reach its peak to be controlled. Meanwhile, the achievement of a sufficient level of basic motor skills by the end of the preschool period is an important premise for children's later participation in many sporting activities. "The achievement of a sufficient fundamental motor skills level by the end of the preschool period is an important premise for the later participation of children in many sports activities" Furthermore, motor learning has been defined as a set of processes associated with practice or experience leading to relatively permanent changes in the capability for responding (Zhu et al., 2012). This is a set of internal processes related to practice/experience that led to a relatively permanent change in ability to respond to something.

The learning method chosen by the teacher is to consider the characteristics of the child's growth and development. Some of the characteristics of junior high school children include: (1) children like to play, it implies school teachers need to design learning that has elements of the game in it; (2) children like to move, it implies the teacher should design learning that allows children to actively move that is useful; (3) children tend to work in groups which are important in the socialization process, such as learning to comply with group rules, learning to be loyal to friends, learning to be responsible, learning to compete with others in a healthy manner, the implication is teachers need to design learning that allows children to learn and work in group; and (4) the child tends to feel or do or demonstrate something directly. According to the theory of cognitive development, therefore, elementary school children have entered the concrete operational stage. For children, the teacher's explanation of the subject matter will be understandable if a child does it himself or herself (Suyati, 2002). Moreover, Morales-belando et al., 2018 show that skill development can be improved and meaningful if the activities are contextualized. As game-like context allows students to perform their skills

In Indonesian physical education setting, learning materials are divided into big and small balls games. One of the big ball sports frequently in physical education learning at both the elementary and secondary levels is volleyball games. Volleyball is a popular sport in most counties. As strait reveals that the modern game of volleyball, has come to occupy an important place in physical education programs, not only in secondary schools but in elementary schools and colleges as well. Volleyball is quickly displacing basketball as the most popular indoor sport in America, and the number of adults who play the sport is taken into account, both for serious or fun activities (Sudrajat & Soetardji, 2014). The game of volleyball is enjoyable and can be played anywhere with any number of participants. Although players can put on impressive individual displays, they are also a part of a team. Due to the

elements of volleyball that are in line with the goals of learning physical education in schools, this sport is very suitable for use in educational settings. Volleyball presents an opportunity for both boys and girls, to participate in a game that avoids direct body contact but still provides an interesting game. It is a game that demands personal excellence to learn how to play and offers a genuine chance to show sportsmanship. Both players and spectators will experience dramatic, spectacular, and exciting situations while playing the game. It has all the necessities for a sport. All it requires is appropriate development and support (Streit, K, 2015).

Volleyball in physical education plays an important role in promoting students' healthy living habits because it can be done in an open field, or even on a not too large area, a ball that is very easy to obtain, and a net that is very likely to be modified if the teacher can present volleyball lessons. In an interesting and enjoyable way, students can master various basic techniques of playing volleyball, so students tend to enjoy playing volleyball. It does not require a large workforce, a large field, and even the facilities and infrastructure are easy to obtain and modify. On the other hand, for students and parents who want to pursue this sport, there is a huge potential to become a professional athlete, because there are many amateur and professional leagues that can be a place to hone talents and abilities towards a high level of achievement. It is obvious that the sport of volleyball in physical education has a long list of advantages. This is possible if learning is carried out in an effective, efficient, and interesting manner. Learning can achieve goals that are planned, carried out correctly, and are enjoyable.. It is important for educators to find efficient ways to teach basic volleyball techniques so that learning outcomes in volleyball games can be successful. One such method is by presenting learning skills. This will help students learn basic volleyball techniques, which is especially important for improving learning outcomes in volleyball games. They can encourage students to comprehend and be able to perform it by using good and proper movements. (Makadada et al., n.d.).

Students-centered through play is one approach that physical education instructors frequently employ currently. The play-based learning model is one of the efforts that physical education teachers can take to ensure the physical education learning process can reflect Developmentally Appropriate Practice (DAP), practice in accordance with the development stage. In this approach, the teaching assignments submitted must pay attention to changes in the ability or condition of the child and can help encourage change (Hambali, 2018). This is nothing more than a tool to encourage students to engage in their studies and practice more actively on a physical, cognitive, and affective level.

However, physical education faces challenges to promote active learning in their students. According to Shape America's national standards, physically literate individuals apply knowledge of concepts, principles, strategies and tactics related to movement and performance (Ricky, 2018). Therefore, the application of a game-centered approach in physical education classes has the potential to improve student learning and develop students as active learners (Nieves et al., 2019). The play approach is to increase students' awareness of the concept of play through the application of appropriate techniques according to the problem or situation in the real game (Erliana, 2014). A game can provide the venue for a range of social interactions to unfold, competition, cooperation, negotiation, to confirm the value of game-based training for improving skill and physical fitness in team-sport athletes (Rosa et al., 2010).

Based on the observations at Junior High School at Bekasi City, there are still many challenges to overcome in the learning process, as evidenced by the results of the ineffective learning process when performing fundamental volleyball techniques. The basic learning of volleyball are not well mastered by many students. Teachers also have lack of knowledge in providing learning models to modify interesting learning, as much as 59% occurred in the lower pass, 61% in the upper pass, 69% in the under serve 71%, in the upper serve 43%, in the block 49%. Additionally, the findings of the observations demonstrated that teachers lacked the ability to develop the learning process, which caused students to become bored and slowed down the learning process. In addition to the fact that students frequently avoided performing fundamental volleyball techniques, research showing that contact between players caused 23.0% of all injuries (n = 101), overuse injuries accounted for 20.7% (n = 91), and non-contact trauma accounted for 17.3% (n = 76) of all injuries also supported the acquisition of this percentage of errors (Bere et al., 2015). Thus, the results of a playing-based approach in volleyball learning of physical education on improving volleyball basic skills/technique in junior high school will be shown in this paper.

METHOD

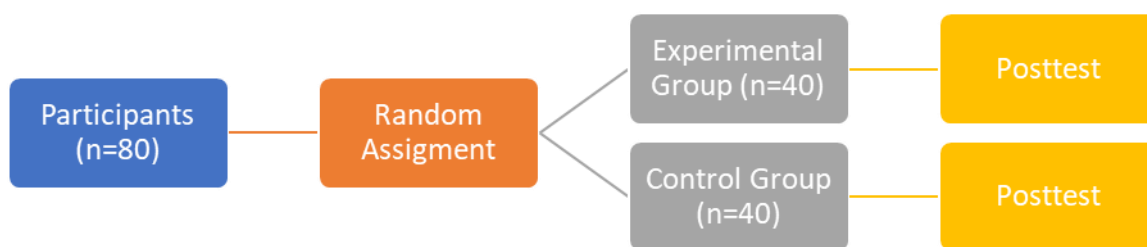


Figure 1. Design of the study

The study used experimental with the posttest-only control group design. Experiment can be defined as a research method that is intentionally, systematic, and aimed/directed to find, formulate, improve, develop, produce, test the effectiveness of products, models, methods/strategies/methods, services, certain procedures that are superior, new, effective, efficient, productive and meaningful (Putra, 2012). Another explained that experiment is the process of researching consumer needs and then developing products to fulfill those needs (Gay et al., 2009). The design of this study as shown in Figure 1. The scenario of treatment for the experimental group are showed in table 1.

Table 1. The treatment scenario of volleyball leaning trough playing-based approach

Skills	Playing activity
Lower Passing	<ul style="list-style-type: none"> • Cheerful ball learning model can be implemented • Cheerful Ball learning model rotates can be implemented • Moving Happy Ball learning model 1st place declared can be implemented • Moving Happy Ball learning model 2nd place can be implemented • The learning model of Passing Under the Target Box can be implemented • The cross box bottom pass learning model can be implemented • Paired Lower Passing learning model stated can be implemented • The learning model of Passing Down 2 vs 2 can be implemented • The learning model of Passing Down 3 vs 3 can be implemented • Lower Passing 4 vs 4 learning model can be implemented
Upper Passing	<ul style="list-style-type: none"> • Happy Ball learning model can be implemented • Happy Ball Spinning learning model stated can be implemented • Happy Ball Moves learning model 1st place declared can be implemented • Happy Ball Moves learning model 2nd place can be implemented • Learning model of Passing Over the Target Box stated can be implemented • The learning model of Passing Over the Cross Box can be implemented • Paired Upper Passing learning model can be implemented • Upper Passing 2 vs 2 learning model can be implemented • Upper Passing 3 vs 3 learning model can be implemented • Upper Passing 4 vs 4 learning model can be implemented

Participants

This study involved 80 students from IX grade of Junior High school at Bekasi City. The participants were taken by simple random sampling from who participated in volleyball extracurricular activities. Since people in the population are viewed as homogeneous, this is how the sampling used (Margono, 2004). The participants are skillful the fundamental techniques, but some of the proper

training methods are lacking. Following that, 80 participants were divided into two groups at random: the experimental group (n = 40) and the control group (n = 40).

Data Collection

The research made use of a validated basic skills test for volleyball. Students' capacity to successfully complete a skills test was evaluated. The test were observation and sliding-movement tests. The tools and materials that require are stopwatch, volleyball, whistle, and stationery. The procedure for carrying out the test is as follows; (1) the student stand in a 3-meter circle with a 3-meter boundary line, hold the ball and pass it down; (2) then the timer gives the command "START" and runs the stopwatch; (3) the student directly performs the underhand passing of the volleyball repeatedly for 1 minute; (4) The student must remain within the boundary circle while performing the underpass. The volleyball must be picked up and played again until the allotted time limit if the student cannot pass and hold the ball while playing. ; (5) To ensure that the student stops working on the test right away, the timer issues the command "STOP" at the exact minute time period. ; and (6) while the student is carrying out the test, the supervisor monitors the contact of the ball in the plane of motion and the accuracy of the underpass and counts the number of times the student can pass and the ball falls to the ground or the boundary line for 1 minute. Results from a one-minute analysis of the students' less-than-ideal passing movement skills were recorded.

Data Analysis

The analysis was initiated by administering prerequisite test. Homogeneity test was carried out to determine the similarity of variance or to test that the data obtained coming from a homogeneous population. The decision-making criterion was accepted if the significant value is greater than 0.05. Testing the measurement results data associated with the research findings was intended to help with the analysis so that it is better; consequently, normality will be calculated for this study. Then, independent t-test was used to compare posttest score between groups.

FINDINGS AND DISCUSSION

Findings

Table 2. The results of normality test

Groups	N	Mean	SD	L count	L table	
Control	40	70,43	4,49	-17,745	0,140	Normal
Experimental	40	79,08	2,92	-16,486	0,140	Normal

The data were subjected to a normality test. Based on the aforementioned information, it can be deduced that the research data has a normal distribution because the significance value (sig.) for all data, including that from the experimental group and the control group, indicates that the score of L count is lower than that of L table. Table 2 showed the normality test of the control and experimental group data.

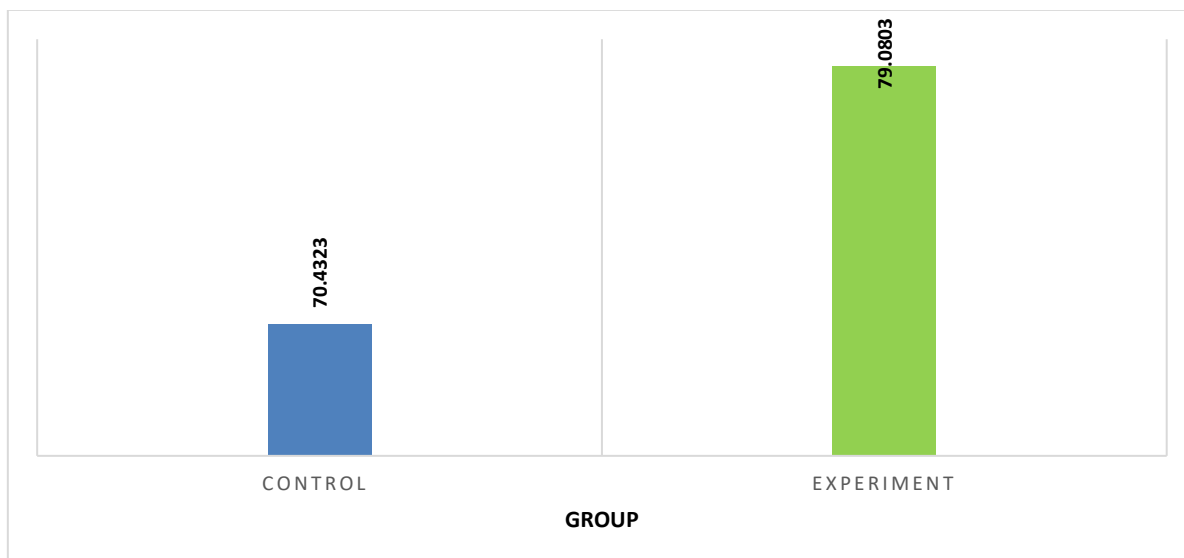


Figure 2. Mean differences of volleyball basic skills posttest scores between groups

The independent t-test were carried out to perform the mean differences in the posttest score of the basic volleyball skills between the experimental and control groups. The results of the analysis as in table 3 and figure 2 show that there is a significant difference in the mean score of the basic volleyball skills posttest in the experimental and control groups. The experimental group given by play-based volleyball learning treatment shows the mean posttest score that is higher than the control group. It can be inferred that play-based learning for volleyball has a more significant impact on enhancing the fundamental volleyball skills of the special lower passing skills.

Table 3. The summary of independent sample t-test of volleyball basic skills post-test scores

Groups	N	Mean	SD	t	df	Sig.
Control	40	70,43	4,49	10,211	78	0,000
Experimental	40	79,08	2,92			

Discussions

This study found that the play-based volleyball learning has a significant impact on student's passing skills in volleyball games. This model, which is based on playing, was created for junior high school students in response to a review of the literature and an analysis of the needs of junior high school students who needed to develop their fundamental volleyball skills. In different schools, there are a number of issues with teaching volleyball game theory and strategy. The play approach is one learning strategy that can be used to enhance ball-serving ability (Sanur, 2016). Likewise, the play-based learning model is related to game, as it needs the power of imagination to make learning much more lively (Erliana, 2014). The play approach, also called the inductive approach, is an approach that prioritizes the process by describing the results of carrying out tasks, emphasizing maximum participation, fun and developing creative power, problem-solving abilities, and not depending on the teacher (Hendarto, 2010). Furthermore, the basic volleyball skills learning model can be applied to school students with low and high motor skills in playing volleyball games (Huang, 2000). Basic volleyball skills can be learned in a way that is simple to comprehend and put into practice, and the criteria for measuring learning success can be either qualitative or quantitative (Ayşe, 2014). The practice of learning fundamental volleyball techniques is implicit, explicit, and sequential, and it is

equipped with information about learning objectives, learning processes, and according to student characteristics. (Lola et al., 2012).

In this study, play-based volleyball instruction aims to enhance passing abilities in volleyball games. It is crucial because passing involves the skill of using the hands to bounce the ball, allowing the next player to attack the defense of the opponent. Once passing, the ball is hit with two hands that are joined and swing downward (lower passing) or with two separate hands that swing upward and slightly forward with open fingers (upper passing). Passing or called a set is a gap where the ball is positioned for a teammate to attack (Barth & Heuchert, 2007). Musthofa et al. (2016) explained that the ability to play the first ball after an opponent's attack, serve, or net play puts the ball in play is known as passing skills in volleyball (cover spike and cover block). Additionally, it is a skill to attempt to pass the ball to his teammates while they are on their own field (Ahmadi, 2007). Therefore, this study is very helpful because passing is an effort made by a volleyball player using a specific skill with the goal of maintaining control of the ball.

However, this study has not been able to see the impact on improving several other basic volleyball skills, such as: service, blocking, and spiking. Volleyball service is an action taken to start or start a volleyball game. In volleyball, service is also an initial attack, therefore every player who serves will try to make a service ball that kills the opponent, such as the giving power and speed of the ball, leading to an empty area, leading to weak players, not very good at passing. or so. The server starts the game, after which the opposing team may only make contact with the ball with their hands and throw it over the net using only their hands. (Perumalsamy et al., 2014). One of the fundamental volleyball skills, blocking, is crucial for team defense because it allows the team to thwart attacks from the opposition. Additionally, blocking is described as a defensive action taken in response to an attack by the adversary (Reeser & Bahr, 2008). Furthermore, volleyball players use a technique called spiking to attack the opponent's zone so that the ball they cross into their zone can be lethal or at the very least make it difficult for them to play the ball perfectly. Meanwhile spiking is a powerful hit in which the hand makes full contact with the ball at the top, sending it flying steeply and quickly. If the ball is higher above the net, it can also be struck downward. (Achmad, 2016). Using the findings of this study as a foundation, future researchers will be able to test the efficacy of playing-based learning models in enhancing other fundamental volleyball skills.

CONCLUSION

According to the study's findings, junior high school students learn basic volleyball skills very effectively when using a play-based learning approach. Researchers have previously created this model using an analysis of needs to determine the fundamental skills students require. Physical education instructors can use this model of learning as a guide to develop engaging, effective, and cutting-edge volleyball games for classroom instruction. It may be simpler for teachers to use or adapt this learning model to physical education lessons in order to broaden the variety and effectiveness of learning. This learning model has also been published as a book. Further research is needed to determine the effectiveness of this model in improving other basic volleyball skills in junior high school students.

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