Problem-Based Learning and Variety of Ball Media Improve the Learning Outcome of Mini-Volleyball Underhand Serve

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This study aims to improve students' ability in the mini-volleyball underhand serve to learn through problem-based learning and a variety of ball media. This research was conducted at Lebak Wangi State Elementary School Bogor. The method used was the action research method with quantitative data with the subject of Physical Education amount of 70 students. Changes and improvements in the mini-volleyball underhand serve learning through ball media variation can be seen in the process assessment results. Based result of the students' learning outcomes of the initial test were only 12 students (34.3\%) and on the final test there were 35 students (100\%), thus there is an increase of 65.7\%. From the research results, it can be concluded that the problem-based learning and variation of ball media can improve the learning outcomes of mini-volleyball underhand serve.

Key words: problem-based learning, ball media, learning outcome, mini volleyball, underhand serve.

Introduction

In the learning process of physical education in elementary schools, Physical Education teachers sometimes encounter obstacles and experience difficulties in the implementation of the learning process. The one which is mostly felt by Physical Education teachers is the lack of physical education facilities and infrastructure owned by schools, which creates a feeling
of discomfort for students and creates a monotonous and boring learning atmosphere so that the achievement of learning outcomes is very low (Masjudin & Arini, 2014), this is known by the failure to achieve a learning completion standard or Kriteria Ketuntasan Minimum (KKM).

The indicator that students have mastered the curriculum that is the ability of learning outcomes measured has reached the KKM that have been set, even better than KKM. With this KKM, students who have successfully been able to continue learning to be able to master the next competencies, and who have not mastered it can deepen those not yet mastered through remedies. This shows the importance of KKM in determining the continuity of student learning (Mardapi, Hadi, & Retnawati, 2015).

The problems in the learning process of physical education in elementary schools, can be seen from direct observation in the field by the researcher in the learning process of physical education, there is 63% student who hasn’t achieve KKM. Therefore, a teacher in the learning process is supposed to apply the 2013 curriculum learning model and be creative in empowering and optimizing the use of available facilities and infrastructure.

Creative teachers will be able to carry out tasks, master materials, have the ability and skills, and choose learning models as needed, as well as to create something new, or vary available tools, so that the students feel pleased in taking physical education lessons provided (Fischman, DiBara, & Gardner, 2006); (Šlahova & Čačka, 2009). It is expected that teachers can provide examples of movements needed in the teaching and learning process through a variety of facilities and infrastructure for physical education learning media, so students will still be active in learning, especially a physical education subject that is closely related movement activities.

In elementary school, volleyball has been adapted into mini-volleyball to make it easier for students to master the basic movements of volleyball. Since in mini-volleyball regulations, tools and facilities are simplified according to the level of growth and development of elementary school students. Therefore, students can play it excitedly (Sri Mawarti, 2009).

In volleyball, many forms of basic movements have to be mastered. Basic movements in volleyball consist of : pass (underarm pass and overhand pass), block, spike and serves (underhand serve and overhand serve) (Wahyudin, 2017). Of all the basic movements, serves are the most dominant ones used in playing volleyball.
The development of volleyball in elementary schools is still not good; this development can be seen from the activities of students in taking physical education lessons in performing volleyball, especially in doing underhand serve. From observing the teaching and learning process, it is found that limited facilities and infrastructure have been causing the monotonous and static learning process (Chatoupis & Emmanuel, 2003).

In physical education learning at the elementary school level, the subject of volleyball in the field of physical education for grade 5, with the time allotment of 2x35 minutes, students are expected to be able to perform a mini-volleyball underhand serve movements properly and correctly. Mini-volleyball can be played on a not-so-wide field. The field to play mini-volleyball can be suited to the circumstances of the school. Mini-volleyball games are complex games that cannot be easily played by every student since playing mini-volleyball requires movement coordination that can be relied upon to do all the movements in a mini-volleyball game (Croitoru, Grigore, Badea, & Hantau, 2013).

Volleyball is now a fast game, in which each team competes to score a lot and wants to finish the match quickly. For this reason, they do serve with a hard and deadly blow in various ways and styles. In the past, serve was just a presentation in the game, but with very rapid development that serve turned into an attack. For this reason, mastery of good underhand serve techniques is needed, so that the results can be improved.

In the process of mini-volleyball learning, especially the underhand serve, many students experience obstacles such as feeling pain in their hands when doing the serve. This is because the ball used is a standard ball (adult size), which means it does not fit the growth and development of elementary school-age students.

On the other hand, serve is a movement by hitting the ball to cross the net towards the opposing field which is 6-12 meters. This requires energy to be able to hit the ball with that distance. Also, to be able to serve the ball to cross the net as high as 2 meters is also an obstacle for students. Therefore, it takes a structured training and learning process. From the description above, the problems of mini-volleyball underhand serve learning in grade 5 of Lebak Wangi State Elementary School Bogor are the serve distance which is quite far, the ball that is too heavy, and the net which is quite high.

In connection with this, in physical education learning, especially mini-volleyball serve in which students are required to master the basic underhand serve movements, the 2013 curriculum learning model is needed, which is a problem-based learning model.
To produce good underhand serve skills, researchers used problem-based learning model with variation in balls as a different mini-volleyball underhand serve learning compared to the media variations that had been implemented before. Based on this, the researchers are interested to researching "The learning outcome improvement of mini-volleyball underhand serve with problem-based learning model in the fifth grade of Lebak Wangi State Elementary School Bogor".

Based on the observations during the learning process of mini-volleyball underhand serve at Lebak Wangi State Elementary School Bogor, several obstacles were found. These obstacles are that students experienced difficulties in understanding the basic movements of mini-volleyball underhand serve due to the inability to adapt to standard volleyball shapes. As a result, the underhand serve movement carried out by students was not perfect.

The real contribution of physical education is to develop psychomotor skills, thus the position of physical education is unique since there are more opportunities than other subjects to develop skills. This also reveals the advantages of physical education from other lessons. If other lessons concerned more with intellectual development, then through physical education, the aspects of reasoning, attitude and skills are built as well.

Physical education is an educational effort by using large muscles, so the educational process that takes place is not hampered by health problems and body growth. As an integral part of the whole education process, physical education is an effort that aims to develop organic, neuromuscular, intellectual and social areas at once (Samsudin, 2010); (Ponidin, Aridhotul Haqiyah, & Riyadi, 2017) The purpose of physical education is to give opportunities to students to learn various activities that foster and develop their potential in physical, mental, social, emotional and moral aspects (Mahendra, 2009).

The main purpose of physical education in elementary schools is to help students improve their mobility, in addition to making them feel happy and willing to participate in various activities (Lutan, 2001).

The learning process will run well when it is accompanied by clear objectives. The purpose of learning is that for behavior changes occur as a result of own experience in interaction with the environment which is shown in various aspects such as changes in knowledge, understanding, perception, motivation or a combination of these aspects, so that the change is meaningful and beneficial for oneself and the surrounding community.
Teaching has the meaning of transferring knowledge from teacher to student which is done intentionally by various processes (Nasution, 2008). The main learning goal is that what is learned is useful in the future, which helps us to be able to continue learning more easily. This is known as the learning transfer. Teaching is the process of delivering information or knowledge from the teacher to students (Sanjaya, 2006).

When the learning process takes place, the teacher plays a very important role. The role of the teacher for students of primary education cannot be replaced by other devices, such as television, radio, computers and so on. The same condition applies to the student as a developing organism that needs adult guidance and assistance. Therefore, the teaching-learning process between teachers and students is the main factor in determining learning outcomes.

Learning outcomes are if someone has learned there is a change of behavior in that person, for example from not knowing to know and from not understanding to understand (Hamalik, 2006). Based on Bloom's Taxonomy theory, learning outcomes in the context of study are achieved through three categories of domains including cognitive, affective and psychomotor (Nurtanto & Sofyan, 2018); (Haqiyyah, Mulyana, Widiastuti, & Riyadi, 2017). The details are as follows: (1) Cognitive Domain; with regard to intellectual and intelligence learning outcomes, a cognitive domain consists of 6 aspects, namely knowledge, understanding, application, analysis, synthesis, and assessment, (2) Affective Domain; about attitude and values, the affective domain includes five levels of ability, namely accepting, answering or reacting, assessing, organization and characterization with a value or complex value, (3) Psychomotor Domain; this includes motor skills, manipulation of objects and neuromuscular coordination (connecting, observing).

Learning outcomes are abilities, knowledge, skills, and attitudes that students get after they receive the treatment given by the teacher, so that they can construct the knowledge in everyday life (Kennedy, Hyland, & Ryan, 2009). In general, learning outcomes can be concluded as something that is achieved by students after the learning process occurs. Learning will change a person who previously does not know to know and from those who do not understand to understand. Therefore, learning is a change in behavior related to knowledge, attitude and skills.

Mini-volleyball is intended to introduce or promote volleyball to children or elementary school students (age 9-13 years old). The regulations, tools, and facilities are simplified so that children can play it excitedly. The mini-volleyball aims to provide an opportunity for elementary school students to play mini-volleyball in the competition that is suited to the
circumstances and physical abilities of students. Apart from that, it is very useful to train basic volleyball movements early on to students, considering that this basic technique is very important for the actual volleyball.

Guidance of mini-volleyball games are carried out from the age of 7-13 years old or elementary school age with regulations that are appropriate for the age of elementary school students. Students will no longer feel afraid and experience failure continuously due to the ball used, the height of the net and the size that are not suitable for their age. With the mini volleyball, elementary school students can carry out learning with optimal results and can perform according to their age level. What should be considered in playing mini-volleyball is about the basic movement.

In its development, volleyball is known as the standard volleyball game specifically played by adults, and mini-volleyball game is played by children aged 9-13 years old, namely elementary school students. Mini-volleyball game is a game played by 4 people in 1 team with simple rules in a field-sized 12x6 meters (PP PBVSI, n.d.) The basic movements of mini-volleyball include serve, pass, spike and block. There are 2 types of serves, namely underhand serve and overhand serve. Serve is an attempt to put the ball into the game by the right-back player who is in the serve area (Samsudin, 2009). Meanwhile, underhand serve means bouncing the ball towards the opponent's field across the net by swinging a hand from below followed by hitting the ball.

To make the serve produce points, the player needs to direct the ball in a certain area of the opponent that is difficult to return, so that the placement of the serve ball in the opponent's area is based on certain calculations that will benefit the team to get scores. Directing the ball so that the falling ball lands close to the back line of the opponent's area and leads to a weak opponent can confuse opponents who are guarding the area, so that it will be difficult to predict whether the ball is coming out or entering.

From these problems, the teacher guides and facilitates student learning by doing a problem-based learning model that is by doing serves with a gradual distance that is from a distance of 2 meters, 4 meters, 6 meters from the net, so that the students are expected to perform the underhand serve well.

The next problem is a standard ball that is too heavy for elementary school students, considering that the standard ball should only be used by adults, so in this study the teacher offers a modification of the balls.
The last problem is the height of the net, in which the net was 2 meters high, then the teacher lowered the net height from 1.5 meters, 1.75 meters, and then 2 meters. With this height variation, it is expected that students can serve well.

From the description above, it can be concluded that the idea of problem-based learning model is inviting students to learn by solving problems that exist in the learning process, so that the mini-volleyball underhand serve learning objectives can be achieved for the fifth graders of Lebak Wangi State Elementary School Bogor.

Problem-based learning (PBL) is an instructional approach learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem (Savery, 2012). The increasingly popular term 'problem-based learning' does not refer to a specific educational method (Barrows, 1986).

The problem solving of some of the students' shortcomings includes providing reinforcement, continuing to motivate and developing self-confidence in students' mindset of the mini-volleyball underhand serve movement learning expected to improve learning outcomes of the mini-volleyball underhand serve learning through a variety of ball media

Method

This research is a classroom action research that aims to improve the learning outcomes of mini-volleyball underhand serve with variations of ball media in fifth-grade students of Lebak Wangi State Elementary School Bogor amount of 70 students.

This Kemmis and M. Taggart model consists of four stages in one cycle; if in this class action deficiencies are found and the predetermined targets are not achieved, then improvements are made to the planning and implementation of the next cycle. This study uses and develops cycles with two cycles. Each cycle is carried out according to changes in the direction of improving the learning process. Before the cycle stage, feasibility studies are carried out as a preliminary study to identify problems and appropriate ideas in the development of the learning process in the classroom.

Results and Discussion

Based on the initial test to determine the condition of students before using the variation of ball media, there was only 34.3% which equals to 12 students who completed the learning
completion standard. The percentage of student completeness after the first meeting was 45.7% which equals 16 students. Percentage of student completeness after the second meeting was 65.7%, which equals to 23 students. The percentage of student completeness after the third meeting was 88.6%, which equals to 31 students.

After the fourth meeting, the percentage of student was finally 100%, all the 35 students. There was an improvement in the mini-volleyball underhand serve by using variations of ball media (Bayu, n.d.). After taking the mini-volleyball underhand serve learning by using a variety of ball media, the following results are obtained: the lowest value 53, the highest value 82, and the average value of 67.71, while the standard deviation is 8.60 (Muhammad, Meme; Aridhotul, 2015).

**Table 1:** Distribution of Cycle I Test Result

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<th>Interval</th>
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<th>Relative Percentage (%)</th>
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<tr>
<td>48-57</td>
<td>5</td>
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</table>

Judging from the table above, it can be concluded that the largest frequency is found in the 68-77 interval with a percentage of 60% and the smallest frequency is in the 78-87 interval with a percentage of 5.7%. From the table above there are still students who have scores below the learning completion standard in the range of 58-67, as much as 20% and the number of students who are far from the learning completion standard scores is in 4 57 entries as much as 14.3%.

Therefore, in cycle I there was still students who were still below the learning completion standard. Students who had met the learning completion standard were 23 students (65.7%) and those who had not met the learning completion standard were 12 students (34.3%). It can be concluded that for the learning outcomes of students' ability to perform mini-volleyball underhand serve, there was an increase from the initial average of 59.77 to 67.71 in the first cycle, and students who completed from 12 students (34.3%) in the initial test to 23 students (65.7%).

The assessment can be seen on the graph of the underhand serve test result of the fifth grade in cycle I as follows: For the assessment in the first cycle, researchers and collaborators
concluded that for the first cycle, there was an increase in psychomotor aspects or the ability to carry out the underhand serve, but it was not significant so that the researchers proceeded to the next cycle.

After carrying out the mini-volleyball underhand serve learning process through variations of ball media in the second cycle, the following results are obtained: The lowest value is 71, the highest value is 94, and the average value is 76.77, while the standard deviation is 8.07.

**Table 2: Distribution of Cycle II Test Result**

<table>
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Judging from the table above, it can be concluded that the largest frequency is found in the 68-77 interval with a percentage of 71.4% and the smallest frequency is in the 78-87 interval with a percentage of 11.4%. While the frequency with the highest value in the range 88-97 with a percentage of 17.2%. From the table above, it can be seen that 100% of students achieved the minimum criteria for completeness, thus the researchers and collaborators concluded that there were no students whose grades were far below the learning completion standard.

The assessment can be seen in the graph of volleyball underhand serve test result as follows: Referring to the results of the assessment of cycle I, there has been an increase from 65.7% to 100% in cycle II. Based on the assessment aspects of cycle II, it can be concluded that variations in ball media can improve mini-volleyball underhand serve the ability of the fifth-grade students in Lebak Wangi State Elementary School Bogor.

**Conclusion**

Based on the results of this study, by using a problem-based learning model, the learning outcomes of mini-volleyball underhand serve can increase from 12 students (34.3%) to 35 students (65.7%) in Lebak Wangi State Elementary School Bogor.

In the initial activity of the research, the researchers saw that most students did not understand the actual concept of mini-volleyball underhand serve. As the study began,
researchers took data which was the initial test. After the initial test, research was carried out by using a variety of ball media.

The next action is carried out in two cycles that have been planned by researchers and collaborators to improve the learning outcomes of mini-volleyball underhand serve.

The problem solving of some of the students' shortcomings includes providing reinforcement, continuing to motivate and developing self-confidence in students' mindset of the mini-volleyball underhand serve movement learning.

Based on the results of the research above, the researcher suggests the following recommendations: (1) Classroom action research is expected to improve the quality of learning, especially physical education subject, (2) Innovation and creativity of physical education teachers in delivering physical education subject matter should not be fixed on one particular teaching variation.

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