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PROBLEM-BASED LEARNING MODEL TO IMPROVE HIGH SCHOOL STUDENTS' KNOWLEDGE OF ATHLETICS SPORTS MATERIAL LEARNING ACHIEVEMENT

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ABSTRACT

The objective of this study was to determine the improvement of student learning achievement in athletics material through the problem-based learning model. This type of research is classroom action research with two cycles. At MA Al-Hikmah Purwoasri, the research sample consisted of 24 students. We conducted this research through a cycle of planning, implementation, observation, reflection, and data collection. The instruments used in this study were test and observation techniques. The data analysis used a quantitative description. The results of the study showed that there was a significant increase in student athletics learning achievement after the problem-based learning model was implemented. This is clear from the results of cycle I, where 47% of the students did not meet the minimum completion criteria of 75, and the class average was only 78.01. On the other hand, cycle II results showed that 91.18% of the 24 students who took the test met the minimum completion criteria of 75. Therefore, the application of the problem-based learning model can enhance student learning achievement in athletics material, particularly in the high jump.

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1. INTRODUCTION

Education is a fundamental requirement for existence in a social community. Indonesia categorizes formal education into several levels: elementary school, middle school, high school, and college (Suryadarma & Jones, 2013). Consequently, education is a vital component of existence. Education encompasses numerous modalities of learning. Learning is an interactive process between educators and learners who share information (Kim, 2024; Onu et al., 2024). Effective interaction is essential for successful learning, influenced by the environment, media, and other factors that enhance engagement in educational activities.

Learning encompasses various domains, including one specific area of study. Physical Education, Sports, and Health is a compulsory subject that every student in

Indonesia must undertake (Friskawati et al., 2023). Physical Education Sports Health examines the capacity for movement and the scientific aspects related to sports health. Furthermore, the study of Physical Education Sports Health encompasses various values, including sportsmanship, cooperation, and discipline (Wang & Chen, 2021; Habyarimana et al., 2022). Additionally, it allows for the assessment of students' physical abilities and skills. Physical education, sports, and health are fundamental components of comprehensive education that emphasize physical activity and healthy living for harmonious physical, mental, social, and emotional growth and development (Zhu & Li, 2022).

Education is a crucial basis for cultivating high-quality human resources (Han et al., 2024). In the realm of sports, education plays a vital role, particularly in enhancing students' physical abilities (Wintle, 2022; Li & Zhang, 2024). High jump athletics is a sport that necessitates proficient motor skills. This fundamental talent is the primary basis for a learner to get optimal performance. Physical education is a kinetic activity that entails the interaction between educators and students, employing prior knowledge to enhance physical well-being. Physical education seeks to preserve and enhance students' health through movement-oriented activities (Brunsdon & Walker, 2022; Askildsen & Aggerholm, 2024). Physical fitness is a key aspect in enhancing human quality.

Athletics is one of the sports that often has sufficient facilities and infrastructure at educational institutions (Fitri et al., 2022). Running, throwing, and jumping disciplines encompass a variety of sports under the umbrella of athletics. The term 'athletics' is derived from the Greek word "athlon," meaning "contest" or "race." Athletics was among the sports contested in the inaugural Olympics in 776 BC. The high jump is a discipline within athletics (Refiater, 2012). The high jump is an athletic discipline that evaluates an athlete's capacity to leap as high as possible over a horizontal bar (McCosker et al., 2021). The name indicates that participants must perform the highest jump over a horizontal bar at a specified height. The competitor with the greatest jump is the victor.

The high jump is an athletic event including an upward leap, where the legs are propelled forward and upward to elevate the body's center of gravity, followed by a rapid descent achieved by pushing off one leg to attain a specific height (Dapena, 2000; Van Caekenberghe et al., 2021). The primary objective of the high jump is to elevate the body to the greatest height possible in order to clear the bar. The elevation of the jump is contingent upon three variables. The jumper must generate maximum lift to propel the body into the air with optimal velocity (Van Caekenberghe et al., 2021). The object's elevation directly correlates with its departure velocity from the ground. Second, the takeoff angle should be as close to vertical as possible to maximize elevation force and propel the body across the bar. The elevation of the center of gravity is constrained by distance. In the target jump, the threshold should range from 2 to 3 feet, at which the optimal jumper may elevate his center of gravity from a stationary stance with his arms positioned at his sides (De la Fuente et al., 2022; Hulu et al., 2022).

Based on the author's observations in the field, it is clear that students' learning achievement in sports are not optimal. Many students have not achieved the minimum completion criteria value that has been set at 75. In addition, students' ability to master high jump sports techniques is still not optimal. Various mistakes made by students during high jump techniques clearly demonstrate this. In the run-up, students run as fast as possible without estimating the distance and height, which reduces their speed and height when they push off. When pushing off, the feet often pass the take-off board, so the jump is considered invalid. While floating in the air, the students' attitudes are not correct.

Lack of implementation of the right learning model likely causes this condition. Therefore, teachers should apply innovative learning models, such as the problem-based learning model or problem-based learning. Problem-Based Learning is a learning model that focuses on problem solving, where the learning process begins with a problem that is then studied to gain knowledge and skills (Yew & Goh, 2016; Phungsuk et al., 2017; Muzaini et al., 2022; Anggraeni et al., 2023; Hasbi & Fitri, 2023). The characteristic of problem-based learning is the involvement of instructors or educators in every stage of its implementation, ensuring that students understand and apply the correct techniques in long jump sports (Rahayu et al., 2018; Aji et al., 2020). Therefore, this study aims to apply the problem-based learning model in high jump athletics learning for high school students.

2. METHOD

This type of research is classroom action research by implementing two cycles, namely cycle I and cycle II. The main objective of this study is to measure the impact of implementing the Problem-Based Learning Model on improving students' high jump abilities in athletic learning. The research sample was MA Al-Hikmah Purwoasri; the research sample consisted of 24 students. The classroom action research process involved cycles of planning, implementation, observation, and reflection. The aim is to improve the quality of learning, improve teacher professionalism, foster a proactive attitude of teachers in improving learning, improve student learning achievement, and develop schools to be better.

The steps of classroom action research in this study are planning, implementation, observation, and reflection. These steps form a cycle that continues to repeat itself, namely in Cycle I and Cycle II. We collected data for this study using a variety of techniques, including observation and testing. The collected data were primary and secondary.

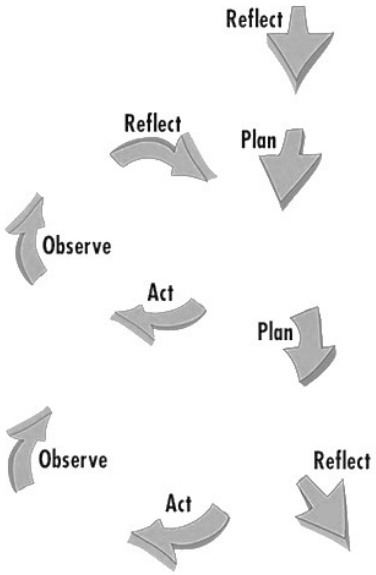

Figure 1. Classroom Action Research Stages Flow

In this study, data analysis involved the collection, cleaning, analysis, and presentation of data in a quantitative descriptive manner.

3. RESULTS AND DISCUSSION

Results

Cycle I

By modifying the learning materials given to students, it is expected to be possible to change the procedures for performing push or support techniques properly and correctly. The modified materials are made by means of games using aids, namely cardboard boxes with the following sequence:

With the learning sequence, namely:

1. The class divides the students into several small groups.
2. The teacher assigns each group a movement learning task to complete.
3. Place 4 cardboard boxes in a row forward with a distance of 1-2 meters.
4. Each group must be able to pass all the cardboard boxes placed in front of the students, as many as 4 cardboard boxes with a specified distance through running movements, then continued by moving through the cardboard
5. If all students in the group are able to pass through the cardboard without touching it at all, the group wins.
6. For those who touch the game, they must start from the beginning again.

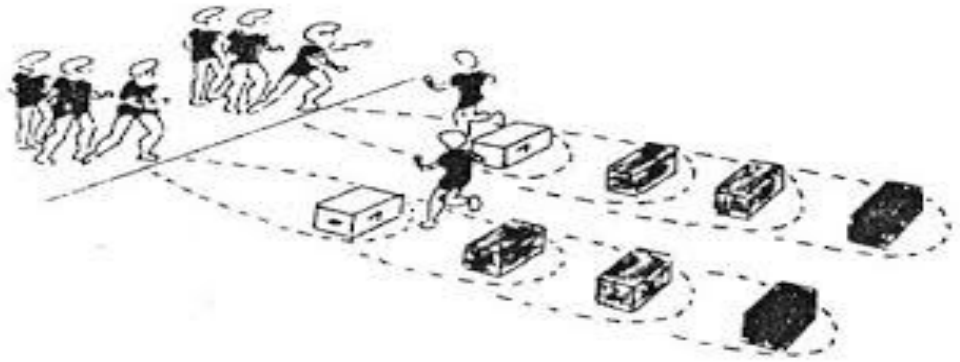

Figure 2. Modification of High Jump Support Technique Game with Cardboard

By using media or modifying learning materials by jumping over the cardboard, it is expected that high jump learning will run dynamically and enjoyably with students actively implementing and observing the correct high jump floating technique. In physical education learning at MA Al-Hikmah Purwoasri, high jump material still has shortcomings, especially in support or push-off. Initial observations showed that the MA Al-Hikmah Purwoasri students had a lot of problems with their high jump skills, mostly with basic techniques like pushing movements. The following is data from observations and tests conducted in Cycle 1, as presented in Table 1.

Table 1. Observations and tests conducted in Cycle 1

No.	Students	Evaluation			Total	Information
		Psychomotor	Affective	Cognitive		
1.	Y1	42,5	30	20	92,5	Completed
2.	Y2	35	22,5	16	73,5	No
3.	Y3	42,5	22,5	18	83,0	Completed
4.	Y4	35	22,5	18	75,5	Completed
5.	Y5	40	30	16	86,0	Completed
6.	Y6	35	30	16	81,0	Completed
7.	Y7	35	15	16	66,0	No
8.	Y8	32,5	22,5	16	71,0	No
9.	Y9	37,5	30	18	85,5	Completed
10.	Y10	45	22,5	20	87,5	Completed
11.	Y11	35	22,5	18	75,5	Completed
12.	Y12	35	22,5	18	75,5	Completed
13.	Y13	37,5	22,5	18	78,0	Completed
14.	Y14	37,5	22,5	18	78,0	Completed
15.	Y15	40	22,5	18	80,5	Completed
16.	Y16	35	22,5	18	75,5	Completed
17.	Y17	37,5	22,5	16	76,0	Completed
18.	Y18	35	15	18	68,0	No
19.	Y19	32,5	15	18	65,5	No
20.	Y20	37,5	22,5	18	78,0	Completed

No.	Students	Evaluation			Total	Information
		Psychomotor	Affective	Cognitive		
21.	Y21	35	22,5	18	75,5	Completed
22.	Y22	32,5	22,5	18	73,0	No
23.	Y23	37,5	22,5	18	78,0	Completed
24.	Y24	30	30	20	80,0	Completed
Average		**36,32**	**24,04**	**17,65**	**78,01**	**73,53**

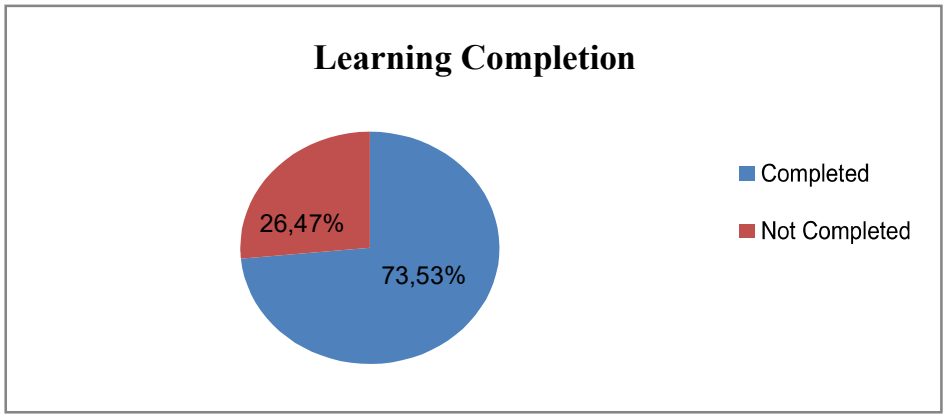

Figure 3. Learning Completion Cycle I

The results in Figure 3 show that 26.47% of the total number of students have not achieved completeness, and the class average is only 78.01. This showed that the target desired by the researcher, namely 85% of the total number of students, has not been achieved, so it must be increased again with cycle II.

To get rid of the problems that come up in cycle I, the researcher has planned actions for cycle II. These include: (1) asking students to pay more attention to explanations and demonstrations while learning with cardboard media so that they can focus on the learning process and meet the learning goals as planned. (2) Researchers and collaborators focus more on observations to master the class and obtain optimal learning achievement.

Cycle II

At this stage, the researcher prepared the learning, consisting of lesson plan 2, formative test questions 2, and supporting teaching tools. Additionally, the researcher prepared an observation sheet for the physical education learning process, which included high jump material.

Students are lined up in a 3-row formation; the teacher leads a prayer, after which a presence is held, and then the teacher explains the high jump lesson material from the start, push, hover, and landing method. The next activity involves warming up, which takes place for 15 minutes. In the first activity, students perform static and dynamic stretching. The teacher provides examples, corrects students whose movements are incorrect, and reprimands students who are not serious about their warm-up.

The next activity is playing frog jump. Students are divided into two groups with the teacher's rules asking some students from each group to be barriers, and students in one group must jump over their groupmates; after reaching the end, the students who are barriers shift and take turns as jumpers one by one. The group that completes the frog jump the fastest, with all members of their group participating, wins.

We will be participating in the core activity for 45 minutes. The first core activity involves starting from the ground. The first is done by running at an adjusted speed; the second is pushing with the strongest leg; the third is floating; the body bounces backwards; and the fourth is landing—how to land with two feet together.

Doing push-off exercises with cardboard media by dividing students into 2 teams, men and women, then establishing a starting place, then pushing with both feet forward by passing the cardboard in front of them arranged in a row at a distance determined by the teacher. The exercise continues with a running start at the previously established distance, followed by a forward jump using the cardboard.

The cardboard media is intended to get maximum jumps, but that does not mean that the movement is fixed on the ball; rather, it is an effort to get a jump push in the high jump. The closing activity is allocated 10 minutes. In the closing activity, students are gathered to hold a comprehensive correction on how to do the correct high jump movement, then give students the opportunity to ask questions, continue with cooling down, pray, and then the students are dismissed. The following table presents the results of observations and tests of high jump athletic learning achievement.

Table 2. Observations And Tests Of High Jump Athletic Learning Cycle II

No.	Students	Evaluation			Total	Information
		Psychomotor	Affective	Cognitive		
1.	Y1	42,5	30	20	92,50	Completed
2.	Y2	37,5	22,5	20	80,00	Completed
3.	Y3	42,5	30	20	92,50	Completed
4.	Y4	37,5	22,5	18	78,00	Completed
5.	Y5	42,5	30	16	88,50	Completed
6.	Y6	40	30	20	90,00	Completed
7.	Y7	35	22,5	16	73,50	No
8.	Y8	32,5	22,5	16	71,00	No
9.	Y9	40	22,5	20	82,50	Completed
10.	Y10	47,5	30	20	97,50	Completed
11.	Y11	40	30	20	90,00	Completed
12.	Y12	37,5	22,5	20	80,00	Completed
13.	Y13	42,5	30	20	92,50	Completed
14.	Y14	40	30	20	90,00	Completed
15.	Y15	42,5	30	18	90,50	Completed
16.	Y16	37,5	22,5	20	80,00	Completed
17.	Y17	40	22,5	20	82,50	Completed
18.	Y18	32,5	22,5	18	73,00	No
19.	Y19	40	30	18	88,00	Completed

No.	Students	Evaluation			Total	Information
		Psychomotor	Affective	Cognitive		
20.	Y20	42,5	30	20	92,50	Completed
21.	Y21	42,5	30	20	92,50	Completed
22.	Y22	42,5	22,5	20	85,00	Completed
23.	Y23	42,5	30	18	90,50	Completed
24.	Y24	32,5	23	20	75,50	Completed
Average		**39,49**	**26,76**	**19,12**	**85,37**	**91,18**

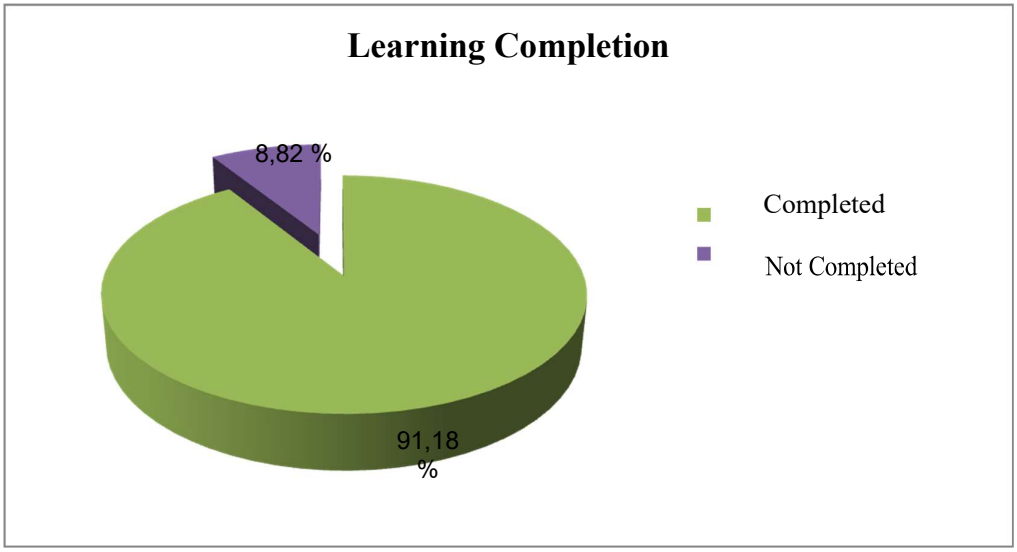

Figure 4. Learning Completion Cycle II

The data in Figure 4 showed that the average learning achievement of students in high jump learning with cardboard media in cycle II increased. This increase can be seen from the number of students who completed; namely, 91.18% of students from a total of 24 had scores above the minimum completion criteria of 75.

Discussion

Learning movement is a series of associations of skills or experiences that can change movement abilities towards the performance of certain movement skills (Said & Hanafi, 2023; Anwar et al., 2024). A person's movement skills undergo changes as a result of the movement learning process. This shows that the movement skills possessed are not only influenced by the movement maturity factor but also by the movement learning process experienced by the individual. In addition, it is important to recognize that the way teachers give appreciation to students who are skilled in performing high jump movements also has a significant impact (Pacholek & Zemková, 2022). The appreciation given by teachers can motivate students to continue to improve their movement skills, provide positive encouragement, and increase students' self-confidence in carrying out physical activities. By providing appropriate appreciation,

teachers can strengthen students' movement learning process and improve the results achieved in high jump learning.

The evaluation of Cycle I showed that the percentage of high jump students who were able to use the Problem-Based Learning model with syntax, specifically the first presentation of sprint running problems, improved their skills. Second, investigate high jumps. The third step involves the formation of work groups. Fourth is the formulation of training plans. The fifth step involves implementing the training. The sixth step involves evaluation and reflection. The results showed that 26.47% of the students who had not achieved completeness, and the class average was only 78.01. The total number is 78.01 with the statement that it has not been completed because it is below the minimum completeness criteria value for athletic learning. Therefore, cycle II at MA Al-Hikmah Purwoasri continues the learning process for high jump athletics material.

The implementation of cycle II learning aligns with cycle I, utilizing a problem-based learning model that follows a specific learning flow, starting with the presentation of high jump problems. Second, investigate high jumps. The third step involves the formation of work groups. Fourth, formulate a training plan. Fifth, implementation of training. The sixth step involves evaluation and reflex testing. The results of the cycle II assessment of students' high jump abilities are that 91.18% of students out of a total of 24 students have a score above the minimum completion criteria of 75. The total number of students, 91.18%, has received a statement of completion, indicating that they have met the minimum completion criteria for high jump athletics learning. Therefore, in this learning practice, there is no need to do it in the next cycle.

From a sampling of 24 students after an initial assessment was carried out by taking scores without using the learning method, it turned out that almost all students were still not perfect in carrying out the high jump movement, starting with the start, jump, hover, and landing activities, which include assessment aspects, namely view, hands, body, and feet. After using the cardboard jump learning method, the students' movements and knowledge of the high jump improved; specifically, 24 students achieved higher scores in the start, jump, hover, and landing exercises. This learning model is supported by the creation of used cardboard learning media by modifying it with colors that can attract students' interest in teaching and learning activities. Students can use this learning model for high jump athletics material, which they perceive as challenging.

Therefore, the problem-based learning model used in high jump athletics with Cardboard Jump aligns with the thinking level of the students. In this learning, children become more enthusiastic, interested, and excited about participating in learning activities so that they can increase students' knowledge of the material presented. The application of the Problem-Based Learning model improves students' ability to think critically. The level of student participation in responding to the learning topics demonstrates this.

The application of the problem-based learning method in providing high jump material in athletics is expected to help students become more confident and brave in achieving learning completion. Students' skills in the long jump movement show that they have succeeded and do not feel bored, so that learning time feels like it passes

quickly. Students show joy and enthusiasm in participating in learning, even feeling that learning time feels short. This shows that the problem-based learning model is able to provide a fun and effective learning experience for students (Gonzalez, 2019; Aslan & Duruhan, 2021).

The study's results indicate that the problem-based learning model effectively enhances students' high jump technique skills. We can apply this model to enhance student learning achievement in other learning materials. This confirms that problem-based learning is a relevant learning model and can make a positive contribution to achieving learning objectives.

4. CONCLUSION

The application of problem-based learning models can improve the learning achievement of students at MA Al-Hikmah Purwoasri in athletics material, especially high jump. The results of the study showed that there was a significant increase in students' athletic learning achievement after the application of the problem-based learning model. This can be seen from the results of cycle I, namely that 47% of students did not meet the minimum completion criteria of 75, and the average class score was only 78.01. In cycle II, the results revealed that 91.18% of the 24 students who took the test met the minimum completion criteria of 75. This learning model is in accordance with the level of student thinking. In this learning, children become more enthusiastic, interested, and excited about participating in learning activities so that they can increase students' knowledge of the material presented.

As a suggestion, teachers should not only teach by referring to student books and teacher books and the theme networks that have been provided but dare to innovate contextual thematic learning according to the background of students and the situation and conditions of their schools. This will make learning more meaningful. In addition, this study can be a reference for further research.

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