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The Effectiveness of Problem-Based Learning (PBL) Strategy On Learning The Concept Of Travelling Violation In Basketball

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ABSTRACT

This study aims to examine the effectiveness of the Problem-Based Learning (PBL) strategy on students' understanding of the concept of *travelling violation* in basketball. The proposed hypothesis is that the PBL strategy is more effective than conventional teaching methods in improving students' conceptual understanding of the material. The research employed a quantitative approach using a quasi-experimental design of the *non-equivalent control group type*. The sample consisted of 30 eighth-grade students from a public junior high school in Trenggalek Regency, divided into an experimental group and a control group using purposive sampling techniques. The research instrument was a multiple-choice test developed based on indicators of conceptual understanding. Data were analyzed using an independent t-test with the assistance of SPSS version 21. The results showed a significant difference between the posttest scores of the two groups, with a significance value (Sig. 2-tailed) of 0.001 < 0.05. The experimental group achieved a higher mean score (84.27) compared to the control group (72.13). These findings indicate that the PBL strategy is effective in enhancing students' understanding of the *travelling* concept by encouraging active thinking and discussion. The implications of this research highlight the importance of implementing PBL strategies in physical education learning, especially in materials that require conceptual understanding of game rules. Further studies are recommended to be conducted over a longer period and on other physical education topics. Additional materials in this study include 9 references and 2 data analysis tables.

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INTRODUCTION

Basketball is a sport taught at the Junior High School (SMP) level in the Physical Education, Sports, and Health (PJOK) subject. Basketball is a competitive game activity that develops motor skills, coordination, teamwork, and strategic skills (Saichudin & Munawar, 2019). However, in practice, many students have difficulty understanding the rules of the game, especially travelling violations. (FIBA Rules, 2024) Travelling violations are illegal movements resulting from changing the pivot of a body part when receiving the ball without first dribbling the ball. As further explained in FIBA Rules, 2024, one form

of travelling violation in basketball occurs when a player lifts the supporting foot before the ball is bounced to the floor or begins to dribble. This condition often occurs because players rush to make movements before the ball touches the court surface, so it is considered an illegal movement. In addition, violations can also occur when a player who receives a pass immediately takes more than two steps without dribbling. This action violates the basic rules of basketball, which require players to take only one pivot step and one follow-up step before dribbling the ball. Another form of travelling violation occurs when a player falls while holding the ball and then rolls or tries to stand while still holding the ball. This movement is considered a violation because the player changes his body position without dribbling, which violates the rules of the game.

The fundamental errors described above demonstrate a poor understanding of the rules. This problem not only impacts inappropriate playing ability but also reflects students' weak cognitive understanding of aspects of basketball rules.

Theoretically, Problem-Based Learning (PBL) is a learning approach that emphasizes solving real-world problems, developing critical thinking, and actively engaging students in the learning process. According to (Mayasari et al., 2022), this problem-based learning model aims to train students to think critically and actively solve real-world problems. This strategy is believed to improve students' understanding of applicable concepts, including those within the context of sports rules.

Several previous studies have shown that the Problem-Based Learning (PBL) approach can improve students' conceptual understanding, critical thinking skills, and problem-solving abilities in various learning contexts. Research by Tanwisastra et al. (2023) demonstrated that the PBL model is effective in improving conceptual understanding of motor skills in Physical Education (PJOK). Furthermore, research by Muhammad Irgi Abdillah Az-zarkasyi & Hindun Hindun (2023) demonstrated that PBL can improve student engagement and learning outcomes. However, most of these studies focused on motor skills or general learning outcomes and did not specifically address the effectiveness of PBL on mastery of game rules, such as travelling violations in basketball.

Research in basketball also focuses more on technical skills such as shooting, passing, and dribbling. Studies on understanding the rules, particularly travelling violations, are still very limited. Meanwhile, understanding the rules is crucial for developing correct and fair playing skills (Aini, 2022). Students' ignorance of travelling violations not only hinders the development of playing skills but also impacts poor discipline and sportsmanship during matches.

Therefore, this research plays a crucial role in enriching the study of the effectiveness of problem-based learning in the context of physical education (PJOK) learning. Its focus on the concept of travelling violations in junior high school basketball is expected to address the limitations of previous research and provide theoretical and practical contributions to the development of targeted learning strategies.

Although numerous studies demonstrate the efficacy of Problem-Based Learning (PBL) strategies in improving conceptual understanding across various subject areas, its application in the context of learning sports rules, particularly travelling rules in

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basketball, has rarely been studied in depth. Most previous studies emphasize learning outcomes related to psychomotor aspects or basic game techniques, while the cognitive aspects related to understanding the rules of the game are often overlooked. Yet, within the constructivist learning theory framework that underpins PBL, conceptual understanding through contextual problem-solving is central to meaningful learning. This issue highlights the importance of an approach that explicitly integrates problem-based learning with mastery of game rule concepts.

Furthermore, few studies have systematically examined how PBL can develop students' in-depth understanding of travelling violations in real-world situations. Previous studies tend to be general and have not detailed the relationship between the problem design used in PBL and students' cognitive achievement regarding game rules. Therefore, this study aims to expand on previous studies by applying PBL strategies specifically to travelling violations, while simultaneously testing the validity of theoretical approaches to rules-based Physical Education (PJOK) learning.

Based on an analysis of the theoretical foundation and the findings of previous studies, this study aims to evaluate the effectiveness of Problem-Based Learning (PBL) strategies in improving understanding of the concept of travelling violations in basketball. The research question addressed is the extent to which PBL strategies can facilitate the improvement of students' cognitive abilities in understanding and correctly identifying travelling violations according to the rules of the game. The novelty of this research lies in its focus on placing game rules as the primary learning object in the context of PJOK, as well as the direct application of PBL strategies to conceptual and applicable teaching materials, which have previously been rarely addressed in similar research.

METHODS

This study uses a quantitative approach. According to (Simbolon & Hendrawan, 2022), a quantitative research approach is a method used to conduct studies on a specific population or sample. The data obtained are analyzed quantitatively using statistical techniques, with the main objective of testing previously formulated hypotheses. This study uses a quasi-experimental design of the non-equivalent control group design, which is a research design that provides treatment without full randomization to groups, thus comparing results between existing groups (Isnawan, 2020). With the aim of determine the effectiveness of the Problem-Based Learning (PBL) strategy in improving understanding of the concept of travelling violation in basketball games. This design was chosen because it allows researchers to compare learning outcomes between the experimental group treated with the PBL strategy and the control group using conventional methods. This design is considered appropriate because it still provides an objective picture of the effect of the treatment in a real classroom situation. The study population was all eighth-grade students at a public junior high school in Trenggalek Regency in the even semester of the 2024/2025 academic year. The sample was selected using purposive sampling, a method that selects samples according to

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criteria required by the author (Dewi, 2019). The criteria were chosen based on the similarity of students' initial abilities and the timing of the Physical Education (PJOK) learning. Two classes, each consisting of 30 students, were selected as samples, divided into an experimental group and a control group. Data collection was conducted using a multiple-choice test to measure students' understanding of travel violations. The test questions were structured based on indicators from the PJOK curriculum and focused on understanding the concept of game rules.

In addition, observation sheets were used during the learning activities to record student engagement in the problem-based learning process. The research steps included a pretest, treatment, and posttest. The experimental group was taught using a PBL strategy, in which students were presented with real-life problems related to travel violations and asked to analyze and find solutions based on existing regulations. The control group learned using the usual method, namely, lecture and demonstration. The pretest and posttest results from both groups were analyzed using a t-test to determine differences in learning outcomes. Data processing was carried out using SPSS 21, with a significance level of 0.05.

RESULTS AND DISCUSSION

The results of the study indicate that the Problem-Based Learning (PBL) strategy has a positive effect on students' understanding of travelling violations in basketball. This is demonstrated after conducting a test on the concept of travelling violations before and after learning, it was found that the scores of students in the experimental group experienced a higher increase than the control group. In the initial test (pretest), the average score of the experimental group was 61.73, while the control group had an average of 62.00. This indicates that the initial abilities of both groups were almost the same. However, after learning was carried out for four meetings, the average score of the final test (posttest) of the experimental group increased by 84.27, while the control group only reached 72.13.

Table 1.

Hasil Uji-t (*Independent Samples Test*)

Levene's Test for Equality of Variances	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
F = 0,821, Sig. = 0,369	-3,58	58	**0,001**	-0,27	0,075	[-0,42 – -0,12]

Source: based on the results of the SPSS statistical test 21

The results of the pretest t-test showed that the variances of both groups were homogeneous (Levene's Test, Sig. = 0.369), so the analysis used the assumption of equal variance. The t-value = -3.58 with Sig. (2-tailed) = 0.001 < 0.05, which means there is a significant difference between the experimental and control groups. However, the average difference is only -0.27, so in practice, the difference is very small, and both groups can be considered to have equal initial abilities.

Table 2
Results of the t-Test (Independent Samples Test)

Levene's Test for Equality of Variances	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
F = 0,935, Sig. = 0,338	7,01	58	**0,001**	12,14	1,73	[8,67 – 15,61]

Source: based on the results of the SPSS statistical test 21

The results of the posttest t-test showed that the variances of both groups were homogeneous (Levene's Test, Sig. = 0.338), so the t-test was conducted assuming equal variances. The t-value = 7.01 with Sig. (2-tailed) = 0.001 < 0.05, which means there is a significant difference between the experimental and control groups. The average difference of 12.14 points indicates that the PBL strategy is effective in improving student learning outcomes.

Discussion

These results indicate that PBL makes learning more efficient because students are actively involved in solving real-life problems. Students not only receive information but are also encouraged to think, discuss, and directly understand the rules of the game. Students learning with PBL experienced a 22.54-point increase in their grades, while students learning with conventional methods only increased by 10.13 points. This indicates that PBL is more effective than lecture methods in helping students understand the rules of the game. This aligns with constructivist theory, which states that students construct their knowledge through active learning experiences. These findings also align with previous research showing that PBL is effective in improving conceptual understanding in Physical Education (PJOK) subjects.

From these results, it can be concluded that the PBL strategy not only helps students understand the material but also trains them to think logically and critically in recognizing game violations. Therefore, this strategy is highly recommended for use in PJOK learning, especially in material related to understanding game concepts and rules. Theoretically, these results support the view that students will understand better if they are actively involved in the learning process. In PBL learning, students are presented with real-life problems, and then they are asked to analyze and solve them through group discussions. This process makes students think deeper and learn more actively, not just listen to the teacher.

CONCLUSION

Based on the research results, it can be concluded that the Problem-Based Learning (PBL) strategy is more effective than conventional learning methods in

improving students' understanding of travelling violations in basketball. This is evident in the higher grades of students in the experimental group compared to the control group. Learning with PBL encourages students to be more active, think critically, discuss topics, and understand the material more realistically and comprehensively. This strategy also helps develop students' social skills during the Physical Education (PJOK) learning process.

However, the results of this study cannot be broadly generalized. The study was conducted in only one school with a limited number of students. Furthermore, the short implementation time of four meetings limits the ability to assess the long-term effects of PBL implementation. Other factors, such as differences in character, initial student abilities, and the learning environment, were also not fully controlled.

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