Indonesian Journal for Physical Education and Sport
https://journal.unnes.ac.id/sju/index.php/inapes
e-ISSN 2774-4434 | inapes@mail.unnes.ac.id
https://doi.org/10.15294/inapes.xxxx

Implementation of Game-Based Learning to Improve Sprint Learning Outcomes of Grade X-5 Students at SMAN 1 Singaraja 2025/2026

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Received: 18 March 2026 **Accepted:** 1 April 2026 **Published:** 11 May 2026

Abstract
This study aimed to improve students' learning outcomes in short-distance running material through the implementation of a game-based learning model in Physical Education, Sports, and Health learning. The study was motivated by the need to enhance students' engagement and learning achievement in athletics, particularly in short-distance running activities. This research employed a classroom action research design conducted in two cycles consisting of planning, action implementation, observation, and reflection stages. The research subjects were 34 students of class X-5 at SMA Negeri 1 Singaraja. Data were collected through observation, learning outcome tests, and documentation. The collected data were analyzed using descriptive quantitative and qualitative analysis to determine the improvement of students' learning outcomes in each cycle. The results showed that the implementation of the game-based learning model significantly improved students' learning outcomes. The average score in the first cycle was 70.49 with a learning mastery level of 44.12%. In the second cycle, the average score increased to 86.37 with a learning mastery level of 94.12%. Improvements were also observed in students' cognitive, affective, and psychomotor aspects. Based on these findings, it can be concluded that the game-based learning model is effective in improving learning outcomes in short-distance running material in Physical Education, Sports, and Health learning.

Keywords: game-based learning; learning outcomes; physical education; sprint running

1. Introduction

Physical Education, Sports, and Health (PJOK) is an essential component of the education system aimed at developing students' physical abilities, motor skills, and social attitudes through structured physical activities. Physical education contributes significantly not only to the development of fundamental movement skills and physical fitness, but also to the enhancement of social skills, positive attitudes, and overall student development (Bailey, 2006; Kirk, 2009). Furthermore, participation in physical education has been shown to support character building, teamwork, sportsmanship, and students' engagement in lifelong physical activity (Dudley, Okely, & Pearson, 2011; Weiss, 2020). Therefore, PJOK learning plays a crucial role in fostering holistic student development, encompassing cognitive, affective, and psychomotor domains. Therefore, the PJOK learning process needs to be designed innovatively to enhance student engagement and learning motivation.

One of the important materials in PJOK learning at the secondary school level is athletics, particularly short-distance running (sprint). Sprinting is a physical activity that requires maximum speed and proper mastery of techniques such as the start technique, acceleration phase, and

finishing technique (Mero, Komi, & Gregor, 1992; Mackala, 2007). Mastery of these techniques is crucial because it affects the effectiveness of movement and students' performance outcomes in athletic activities. However, in practice, sprint learning in schools is often perceived as monotonous by students due to the use of conventional teaching methods, such as demonstrations and repetitive drills without engaging variations (Hastie, Martínez de Ojeda, & Calderón, 2011).

This condition impacts the low level of learning motivation and student engagement during the PJOK learning process (Ntoumanis, 2001; Standage, Duda, & Ntoumanis, 2005). When students are not actively involved, the internalization of motor skills becomes less optimal, resulting in lower learning outcomes. Therefore, a learning approach is needed that can create a more engaging, interactive, and participatory learning environment so that students become more active in the learning process.

One learning approach that can be used to increase student engagement is Game-Based Learning (GBL). Game-Based Learning is a learning model that integrates game elements into the learning process to enhance motivation, participation, and students' understanding of the material being studied (Plass, Homer, & Kinzer, 2015; Camacho-Sánchez & Manzano-León, 2023). This approach allows students to learn through play experiences that are pedagogically designed, making the learning process more enjoyable and meaningful. Research shows that the implementation of GBL in physical education can significantly improve learning motivation, student engagement, and learning outcomes (Camacho-Sánchez & Manzano-León, 2023).

In addition to increasing motivation, game-based learning can also strengthen students' motor skill mastery. A quasi-experimental study conducted by Kumar, Bhardwaj, and Choudhary (2025) found that the implementation of collaborative game-based learning in physical education significantly improved students' movement skills and participation in sports activities. The game-based approach provides opportunities for students to actively explore movements in a healthy competitive environment.

Other studies also show that game-based learning models in physical education are more effective in improving students' physical abilities and learning outcomes compared to conventional methods. Ezeddine et al. (2025) found that the implementation of game-based physical education improved students' learning motivation and academic performance in sports activities. In addition, the game-based approach has been proven to enhance motor skills, teamwork, and discipline in sports learning activities (Fizi, Winarni, & Hartanto, 2023).

Although numerous studies have demonstrated the effectiveness of Game-Based Learning in physical education, most have focused on general learning outcomes without addressing specific athletic skills that require structured technical mastery. In particular, limited attention has been given to the application of Game-Based Learning in sprint instruction, which involves complex phases such as the start, acceleration, and finishing that demand both technical precision and active student engagement. Furthermore, previous research rarely integrates the assessment of cognitive, affective, and psychomotor domains simultaneously within sprint learning contexts. Therefore, this study seeks to fill this gap by implementing Game-Based Learning in sprint instruction to enhance students' learning outcomes in a more comprehensive manner.

Based on these problems, this study aims to examine the implementation of the Game-Based Learning (GBL) model in Physical Education sprint learning to improve students' learning outcomes through structured game activities such as Sprint Challenge, Quick Start, Mini Relay, Shadow Catch, Fastest Gets It, Position Change Sprint, and Zig-Zag Sprint, which are designed to enhance students' speed, coordination, reaction, and mastery of sprint techniques. In this study, learning outcomes include three main domains: cognitive, affective, and psychomotor aspects. The implementation of a game-based learning model is expected to enhance learning motivation, student engagement, and mastery of basic sprint techniques more effectively.

Thus, this study is expected to contribute to the development of more innovative and effective PJOK learning strategies, particularly in athletics learning at the senior high school level. In addition, the results of this study are expected to serve as a reference for PJOK teachers in developing game-based learning methods to improve the quality of the learning process and student learning outcomes.

2. Method

This study employed a Classroom Action Research (CAR) approach. Classroom Action Research is a type of research conducted by teachers in their own classrooms through specific actions aimed at improving and enhancing the quality of the learning process and students' learning outcomes (Kemmis & McTaggart, 1988; Burns, 2010). CAR is typically carried out in cycles consisting of planning, action, observation, and reflection stages (Santra, 2021; Fauzan, Siregar, & Siregar, 2025). This research was conducted at SMAN 1 Singaraja with students of class X-5 in the 2025/2026 academic year. The research subjects were all students in the class, totaling 34 students, consisting of 16 male and 18 female students. This study aimed to improve students' learning outcomes in short-distance running (sprint) through the implementation of a Game-Based Learning model in PJOK lessons.

The research design followed a CAR model consisting of two cycles, where each cycle included four stages: (1) Planning, (2) Action, (3) Observation, and (4) Reflection. At the planning stage, the researcher prepared learning tools including teaching modules, game-based learning scenarios, student activity observation sheets, and learning outcome assessment instruments. The action stage was carried out by implementing the game-based learning model in sprint learning according to the designed scenario.

The observation stage was conducted simultaneously with the implementation of the action to monitor student activities during the learning process. Observations were carried out using prepared observation sheets to record student engagement, participation in games, and the learning process occurring in the classroom. Furthermore, the reflection stage was conducted to evaluate the results of the action in each cycle in order to identify shortcomings during the learning process. The results of the reflection were then used as a basis for improving actions in the next cycle.

Data collection techniques in this study included observation, learning outcome tests, and documentation. Observation was used to monitor student activities during the learning process. Tests were used to measure students' learning outcomes in sprint material, covering cognitive, affective, and psychomotor aspects. Meanwhile, documentation was used to obtain supporting data such as student attendance lists, photos of learning activities, and other relevant documents.

The data analysis techniques used in this study were descriptive quantitative and qualitative analysis. Quantitative data were obtained from students' learning test results and analyzed to determine improvements in learning outcomes in each cycle. Meanwhile, qualitative data were obtained from observations of student activities during the learning process. The success of this study was determined based on the improvement of students' learning outcomes that achieved the Minimum Learning Achievement Criteria (KKTP) set by the school.

3. Result

This study aims to determine the improvement of PJOK learning outcomes in short-distance running (sprint) material through the implementation of the Game-Based Learning (GBL) model for students of class X-5 at SMAN 1 Singaraja. The study was conducted through two cycles of classroom action research, each consisting of planning, action, observation, and reflection stages. Before the implementation of the action, a preliminary observation was conducted to identify the initial condition of students' learning outcomes. The results showed that the average score of students' learning outcomes was still below the Minimum Learning Achievement Criteria (KKTP) set at 75. The initial average score was 68.3, with a learning mastery level of 43.7%.

The implementation of Cycle I was carried out by applying the Game-Based Learning model to sprint material. The results of the analysis of students' learning outcomes in Cycle I are presented in Table 1.

Table 1. Analysis of students' learning outcomes in cycle I

Assessment aspect	Average	Category
Cognitive	67.35	Fair
Psychomotor	74.85	Good
Affective	69.26	Fair
Overall Average	70.49	Fair

Based on Table 1, the average learning outcome in Cycle I was 70.49, which falls into the fair category. This result shows an improvement compared to the initial condition, but it has not yet reached the predetermined success indicator.

The level of learning mastery in Cycle I is presented in Table 2.

Table 2. Students' learning mastery in cycle I

Assessment aspect	Number of students	Percentage
Mastery (≥75)	15	44.12%
Non-Mastery	19	55.88%
Total	34	100%

Based on Table 2, the percentage of learning mastery in Cycle I was 44.12%, which has not met the success indicator of at least 80% of students achieving a score ≥75.

In Cycle II, improvements were made based on the reflection results from Cycle I. The learning process was again carried out using the Game-Based Learning model with more engaging game variations and clearer technical instructions.

The results of the analysis of students' learning outcomes in Cycle II are presented in Table 3.

Table 3. Analysis of students' learning outcomes in cycle II

Assessment aspect	Average	Category
Cognitive	83.97	Good
Psychomotor	89.26	Very Good
Affective	85.88	Good
Overall Average	86.37	Very Good

Based on Table 3, the average learning outcome in Cycle II increased to 86.37, which falls into the very good category.

The level of learning mastery in Cycle II is presented in Table 4.

Table 4. Students' learning mastery in cycle II

Assessment Aspect	Number of Students	Percentage
Mastery (≥75)	32	94.12%
Non-Mastery	2	5.88%
Total	34	100%

These results indicate that the level of learning mastery in Cycle II reached 94.12%, meaning that the success indicator of the study has been achieved.

The comparison of improvement between Cycle I and Cycle II is presented in Table 5.

Table 5. Comparison of learning outcomes in cycle I and cycle II

Cycle	Average score	Mastery
Cycle I	70.49	44.12%
Cycle II	86.37	94.12%
Increase	15.88	+50%

Based on Table 5, the average learning outcomes increased by 15.88 points from Cycle I to Cycle II. In addition, the mastery percentage also increased significantly from 44.12% to 94.12%.

These findings indicate that the implementation of the Game-Based Learning model significantly improved students' learning outcomes in sprint material.

4. Discussion

The results of this study indicate that the implementation of the Game-Based Learning (GBL) model in PJOK learning on sprint material significantly improves students' learning outcomes. This improvement can be seen from the results in each research cycle. In Cycle I, the average score

was 70.49 with a mastery level of 44.12%. After improvements in Cycle II, the average score increased to 86.37, with a mastery level reaching 94.12%. These results indicate that the application of a game-based learning model has a positive impact on improving students' learning outcomes.

The improvement in learning outcomes occurred because the Game-Based Learning model creates a more active, enjoyable, and participatory learning environment. In game-based learning, students do not only receive material passively but are also directly involved in movement activities through games designed according to learning objectives. This active involvement allows students to understand basic sprint techniques more effectively through direct experience during the learning process.

These findings are consistent with the study conducted by Dese, Wibowo, and Widyaningtyas (2025), which states that the implementation of game-based learning in physical education can significantly improve students' learning motivation and motor skills. The game-based approach allows students to practice movement skills repeatedly without feeling bored because learning activities are presented in an engaging format.

In addition, research by Fizi, Winarni, and Hartanto (2023) also shows that game-based learning models in physical education can improve motor skills, teamwork, and student discipline. This occurs because game activities encourage students to actively participate and collaborate with their peers during the learning process.

In the context of sprint learning, the use of a game-based approach also helps students better understand basic sprint techniques such as starting technique, acceleration phase, and running technique. Game activities provide opportunities for students to practice sprint movements naturally in more varied situations compared to conventional training. This is supported by research by Ardiansah and Wijaya (2025), which shows that game-based learning models can improve mastery of basic sprint techniques because students are more actively engaged in movement and practice during the learning process.

In addition to improving psychomotor aspects, the Game-Based Learning model also influences improvements in cognitive and affective aspects. In this study, cognitive scores increased from 67.35 to 83.97, psychomotor scores from 74.85 to 89.26, and affective scores from 69.26 to 85.88. These improvements indicate that game-based learning can enhance conceptual understanding, movement skills, and positive attitudes of students in participating in PJOK learning.

These findings are also supported by research by Yan, Jones, and Smith (2022), which states that game-based learning approaches in physical education can improve basic motor skills, physical activity, and student engagement during the learning process. This approach is considered more effective than conventional methods because it creates a more interactive and enjoyable learning environment.

Thus, this study shows that the implementation of Game-Based Learning is an effective strategy for improving PJOK learning outcomes in sprint material. This model not only enhances students' technical abilities but also increases motivation, participation, and engagement in the learning process.

5. Conclusion and Recommendation

Based on the results of the study, it can be concluded that the implementation of the Game-Based Learning (GBL) model in PJOK learning on short-distance running (sprint) material significantly improves students' learning outcomes. This improvement is reflected in the increase in the average learning score from 70.49 in Cycle I to 86.37 in Cycle II, as well as the rise in learning mastery from 44.12% to 94.12%. Furthermore, improvements were observed across cognitive, affective, and psychomotor domains, indicating that game-based learning not only enhances students' movement skills but also improves their understanding and fosters positive attitudes toward participation in physical education. Therefore, the Game-Based Learning model can be considered an effective and innovative instructional strategy to enhance student engagement and learning outcomes, particularly in athletics learning.

In light of these findings, it is recommended that PJOK teachers adopt the Game-Based Learning approach as an alternative teaching strategy to improve student motivation, participation, and achievement. Schools are also encouraged to support the implementation of innovative learning models by providing adequate facilities and professional development opportunities for teachers. Students are expected to actively engage in learning activities and utilize game-based experiences to develop their skills and understanding. Future researchers are advised to explore the application of Game-Based Learning in other PJOK materials or at different educational levels, as well as to develop more varied and innovative game designs to further optimize learning outcomes.

Acknowledgement

This research would not have been successfully completed without the assistance, guidance, support, and valuable input from various parties. Therefore, the author would like to express sincere gratitude to all those who have contributed to the implementation of this study, especially to the school, the PJOK teacher, and the students who participated and supported the research process. The author also extends appreciation to the supervisors and other parties who have provided direction and constructive suggestions throughout the preparation of this research. It is hoped that this study can contribute to the development of Physical Education, Sports, and Health (PJOK) learning, particularly in the implementation of the Game-Based Learning model as an alternative instructional strategy to improve students' learning outcomes.

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