



Implementation of Learning Method Based On Modification of The Jump Athletics Game To Improve Interest In Learning Sports Education In Grade V of SDN Cibodas 3

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ABSTRACT

Physical Education (PJOK) plays an essential role in developing students' physical, cognitive, and affective domains; however, low student interest due to monotonous teaching methods remains a major challenge in elementary schools. This study aims to determine the effect of implementing a learning method based on the modification of jumping athletics games on increasing students' learning interest in PJOK. This research employed a quantitative method with an experimental approach, using a one-group pre-test post-test design. The population consisted of all 36 fifth-grade students of SDN Cibodas 3. Data were collected through a learning interest questionnaire and a jumping athletics ability test administered before and after the treatment. Data analysis included a normality test using the Shapiro-Wilk method and hypothesis testing using a paired sample t-test. The results showed that the average pre-test score of students' learning interest was 103.35, which increased to 128.42 in the post-test, with a mean difference of 25.09. The t-test results indicated that the calculated t-value (9.88) was greater than the t-table value (2.03) at a significance level of 0.05, leading to the rejection of H_0 and acceptance of H_1 . These findings indicate a significant effect of the modified game-based learning method on improving students' learning interest. In conclusion, the implementation of modified jumping athletics game-based learning creates a more engaging, interactive, and enjoyable learning environment, which significantly enhances students' participation, motivation, and interest in PJOK learning.

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A. Conception and design of the study;
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INTRODUCTION

Education is fundamentally a conscious and systematic effort aimed at creating learning environments that enable students to actively develop their potential in cognitive, affective, and psychomotor domains (Abd Rahman BP et al., 2022). In the context of primary education, this holistic development becomes particularly critical, as it shapes not only intellectual capacity but also character formation, emotional maturity,



and physical competence. One of the essential subjects contributing to this multidimensional development is Physical Education (PJOK), which integrates physical activity with educational values such as discipline, cooperation, and sportsmanship (Iswanto & Widayati, 2021).

However, despite its strategic role, the implementation of PJOK often encounters practical challenges, particularly in elementary school settings. At SDN Cibodas 3, for instance, fifth-grade students demonstrate low engagement and limited participation during physical education lessons. This issue is primarily associated with the use of conventional teaching methods—such as demonstration-based instruction—that tend to be monotonous and less interactive. As a result, students quickly lose interest, leading to passive learning behavior and suboptimal mastery of motor skills (Widiyani et al., 2024).

Learning interest is a critical determinant of educational success, especially in PJOK, where active participation directly influences skill acquisition. Students with high learning interest tend to engage more deeply, exhibit higher motivation, and demonstrate faster improvement in motor competencies. Conversely, low interest results in disengagement, boredom, and diminished learning outcomes (Hidi & Renninger, 2016; Widiyani et al., 2024). This condition highlights the urgent need for innovative pedagogical strategies that can stimulate student interest and encourage active participation.

Another challenge lies in the limited creativity and adaptability of teaching approaches. Teachers are often constrained by inadequate facilities, large class sizes, and diverse student characteristics, which demand flexible and context-sensitive instructional designs (Nita Prianti & Sri Prihatin, 2020). Without creative intervention, these constraints can hinder the effectiveness of PJOK learning. Therefore, developing engaging, student-centered learning methods becomes a priority to address these issues.

Recent developments in physical education research emphasize the importance of student-centered and game-based learning approaches. Game-based learning has been widely recognized as an effective strategy to enhance motivation, engagement, and learning outcomes in physical education (Harvey & Jarrett, 2014; Casey & Goodyear, 2015). This approach transforms traditional instruction into interactive experiences that encourage exploration, creativity, and enjoyment.

One prominent concept within this framework is game modification, which involves adapting rules, equipment, and learning environments to suit students' developmental levels and learning objectives (Bayu Mardika Dinarta, 2021). Modified games simplify complex skills, making them more accessible and enjoyable for students. Research indicates that such modifications can significantly improve students' participation and skill mastery, particularly in elementary school settings (Light, 2013; Dyson et al., 2016).

In athletics education, jumping activities represent fundamental motor skills that contribute to overall physical development. Athletics is often referred to as the "mother of sports" due to its foundational role in developing basic movement patterns such as

running, jumping, and throwing (Imam Abdul Hafidz et al., 2021). Jumping, specifically, requires coordination, balance, and strength, making it an essential yet challenging component of PJOK curricula (Puspitasari, 2016).

Several studies have explored the integration of modified athletic games to improve learning outcomes. For example, Kurniawan (2023) demonstrated that incorporating modified jumping games can enhance student enthusiasm and reduce boredom. Similarly, Setianingsih (2024) highlighted the role of teacher creativity in designing adaptive learning environments that maximize student engagement despite limited resources.

Furthermore, contemporary pedagogical models such as Teaching Games for Understanding (TGfU) and Sport Education Model (SEM) reinforce the importance of contextualized, game-based instruction in developing both technical skills and affective outcomes (Kirk, 2010; Hastie et al., 2017). These models emphasize meaningful learning experiences, where students actively participate in problem-solving and decision-making processes.

Although previous studies have established the effectiveness of game-based learning and instructional modifications in physical education, several gaps remain. First, most existing research focuses on general physical education activities without specifically addressing modified athletics games, particularly jumping-based activities, in elementary school contexts. This lack of specificity limits the applicability of findings to targeted skill development.

Second, while the relationship between game-based learning and student motivation has been widely examined, there is limited empirical evidence linking modified athletics games to students' learning interest as a primary outcome variable. Many studies emphasize skill performance or physical fitness, leaving the affective domain especially learning interest underexplored (Chen et al., 2017).

Third, the role of teacher creativity as a mediating factor in implementing modified learning methods has not been sufficiently investigated. Most studies treat instructional models as fixed frameworks, without considering how teachers adapt these models to real classroom conditions, including constraints in facilities, weather, and student diversity.

Additionally, research conducted in Indonesian primary school settings, particularly in rural or semi-rural areas such as Cibodas Village, remains limited. Contextual factors such as local culture, infrastructure, and student characteristics may significantly influence the effectiveness of learning innovations, yet these aspects are often overlooked in global studies.

Therefore, this study seeks to fill these gaps by focusing on the implementation of a modified jumping athletics game as a learning method, examining its impact on student learning interest, and analyzing the role of teacher creativity in optimizing the learning process.

Based on the identified problems and research gaps, this study aims to: Analyze the effectiveness of implementing a modified jumping athletics game-based learning

method in improving students' interest in PJOK learning. Examine how learning modifications can be designed and implemented optimally in elementary school settings. Investigate the role of teacher creativity in creating engaging and effective physical education learning environments.

The novelty of this research lies in several key aspects. First, it integrates modified athletics-based learning with a specific focus on jumping activities, which has not been extensively explored in previous studies. Second, it positions learning interest as the primary outcome variable, providing a deeper understanding of affective learning dimensions in physical education. Third, it incorporates teacher creativity as a critical variable, bridging the gap between theoretical instructional models and practical classroom implementation.

Moreover, this study offers a contextual contribution by examining these variables within the setting of SDN Cibodas 3, thereby providing insights relevant to similar educational environments in Indonesia. The findings are expected to contribute both theoretically by enriching the literature on game-based learning and instructional modification and practically by offering actionable strategies for teachers to enhance student engagement.

In summary, the challenges of low student interest and limited engagement in PJOK learning require innovative and context-sensitive solutions. The integration of modified jumping athletics games presents a promising approach to address these issues by creating enjoyable, interactive, and meaningful learning experiences. By examining the effectiveness of this method and the role of teacher creativity, this study seeks to contribute to the improvement of physical education practices, particularly in elementary school settings. Ultimately, the research is expected to provide a valuable reference for educators and researchers in developing more effective and engaging PJOK learning strategies.

METHODS

This study employed a quantitative research approach with an experimental method, which is widely recognized for its ability to systematically examine causal relationships through numerical data analysis and statistical procedures. Quantitative research emphasizes objectivity, structured data collection, and statistical interpretation, allowing researchers to test hypotheses and draw generalizable conclusions (Mustafa et al., 2022; Creswell & Creswell, 2018). The experimental approach is particularly suitable for evaluating the effect of specific treatments on behavioral outcomes, as it enables the comparison of conditions before and after intervention (Rangkuti, 2016; Fraenkel et al., 2019).

The research design used in this study was a pre-experimental design with a one-group pretest-posttest format. This design involves measuring participants' initial condition (pretest), applying a treatment, and subsequently measuring the outcome (posttest) to determine the effect of the intervention (Sugiyono, 2016; Ary et al., 2019). Although this design does not include a control group, it remains effective for preliminary

investigations in educational settings where full experimental control is difficult to implement (Kusman, 2018; Cohen et al., 2018). The structure of the design is presented as follows:

Group	Pre-Test	Treatment	Post-Test
Experimental	X ₁	T	X ₂

The population of this study consisted of all fifth-grade students at SDN Cibodas 3, totaling 36 students. A total sampling technique was used, as the entire population was included in the study. This approach ensures comprehensive representation and reduces sampling bias (Etikan & Bala, 2017). The selection of this population was based on observed challenges, particularly low student interest in PJOK learning due to the dominance of conventional teaching methods.

The research instrument used to collect data was a structured questionnaire designed to measure students' learning interest in physical education, complemented by observational checklists for motor activity engagement. Instruments in quantitative research must demonstrate validity and reliability to ensure accurate measurement of research variables (Suhardi, 2018; Taherdoost, 2016). The questionnaire employed a Likert scale format, capturing dimensions such as attention, enjoyment, participation, and motivation.

The research procedure consisted of three main stages: pretest, treatment, and posttest. The pretest was conducted during the first meeting to assess students' baseline learning interest and initial understanding of athletics jumping material. At this stage, no intervention was applied, allowing the researcher to establish initial conditions (baseline data).

The treatment phase was implemented over ten meetings using a modified jump athletics game-based learning method. The learning process followed three stages: (1) Play 1 (initial play), involving warm-up activities such as frog jumps and jump rope to stimulate motivation and coordination; (2) Teach, where fundamental jumping techniques including approach run, take-off, body positioning, and landing were delivered systematically; and (3) Play 2 (modified game), which incorporated a competitive group-based activity using creative equipment (sacks and hula hoops) to enhance engagement and motor skills. Game-based learning strategies have been shown to significantly improve student motivation and participation in physical education contexts (Harvey & Jarrett, 2014; Casey & Goodyear, 2015).

The posttest was conducted after the completion of the treatment to evaluate changes in students' learning interest. The assessment focused on cognitive understanding, psychomotor performance, and affective engagement.

Data analysis was performed using a paired sample t-test, which is appropriate for comparing pretest and posttest scores within the same group. This statistical test determines whether there is a significant difference in mean scores before and after the intervention (Soeprajogo & Ratnaningsih, 2020; Field, 2018). A significance level of $\alpha = 0.05$ was applied to test the research hypothesis.

RESULTS AND DISCUSSION

Result

This section presents the findings of the quantitative analysis conducted to examine the effect of the implementation of a modified jump athletics game-based learning method on students' interest in Physical Education (PJOK) learning among fifth-grade students at SDN Cibodas 3. The analysis includes descriptive statistics, normality testing, hypothesis testing using a paired sample t-test, and interpretation of learning improvement.

Descriptive Statistical Analysis

Descriptive statistics were used to provide an overview of students' learning interest before and after the treatment. The results are summarized in Table 1.

Table 1.

Description of Pre-test and Post-test Data

Variable	Statistical Source	Pre-Test	Post-Test
	N	36	36
Jump Athletics Interest	Mean (M)	103.35	128.42
	Total Score (ΣX)	3720	4623
	Std. Dev (σ)	4.97	14.41

Based on Table 1, the mean score of students' learning interest in jump athletics increased significantly from 103.35 (pre-test) to 128.42 (post-test). This improvement indicates a positive shift in students' engagement after the implementation of the modified learning method. The total score also increased from 3720 to 4623, reflecting an overall enhancement in student participation and enthusiasm.

The standard deviation increased from 4.97 to 14.41, suggesting greater variability in post-test responses, which may indicate differing levels of engagement among students after experiencing the intervention. Overall, these results demonstrate that the modified game-based approach contributed to improving students' learning interest.

Normality Test

Before conducting inferential statistical analysis, a normality test was performed using the Shapiro-Wilk test, as the sample size ($N = 36$) falls within the recommended range (< 50). The results are presented in Table 2.

Table 2.

Normality Test Results (Shapiro-Wilk)

Data Group	Statistic	df	Sig. (p-value)
Pre-Test	0.942	36	0.061
Post-Test	0.958	36	0.182

The significance values for both pre-test ($p = 0.061$) and post-test ($p = 0.182$) are greater than the threshold of 0.05. This indicates that the data are normally distributed, and therefore meet the assumptions required for parametric testing. Consequently, further analysis using a paired sample t-test is appropriate.

Hypothesis Testing (Paired Sample t-test)

To determine whether there was a significant difference between pre-test and post-test scores, a paired sample t-test was conducted. The results are presented in Table 3.

Table 3.
Paired Sample t-test Results

Statistic	Value
Mean Pre-test	103.33
Mean Post-test	128.42
Mean Difference	25.09
t-count	9.88
t-table ($\alpha = 0.05$, $df=35$)	2.03

The results show that the calculated t-value ($t = 9.88$) is significantly greater than the critical t-table value ($t = 2.03$). This indicates that there is a statistically significant difference between pre-test and post-test scores.

Thus, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. This confirms that the implementation of the modified jump athletics game-based learning method has a significant effect on increasing students' learning interest.

Hypothesis Decision

Table 4.
Hypothesis Testing Summary

t-count	t-table	Decision
9.88	2.03	H_0 rejected, H_1 accepted

Since $t\text{-count} > t\text{-table}$ ($9.88 > 2.03$), the statistical decision clearly supports the acceptance of the research hypothesis. This result strengthens the conclusion that the treatment provided had a meaningful and measurable impact on student learning interest. In addition to statistical significance, the study also examined the magnitude of improvement in student learning outcomes. The total score increased from 7506 (pre-test) to 8839 (post-test), representing an improvement of approximately 17.76% .

This increase demonstrates not only statistical significance but also practical significance, indicating that the intervention effectively enhanced students' motivation and engagement in learning activities. The modified game-based method created a more interactive and enjoyable learning environment, which contributed to increased participation and interest. The results indicate that the implementation of a modified jump athletics game-based learning method positively influences students' learning interest. The significant increase in mean scores, supported by statistical testing, confirms that game-based learning can effectively address issues of low engagement and monotonous instruction. Furthermore, the findings suggest that incorporating elements of play, competition, and collaboration into physical education can enhance students' motivation and active involvement. This aligns with the theoretical assumption that enjoyable and meaningful learning experiences are essential for improving student outcomes in physical education.

Discussion

The findings of this study demonstrate that the implementation of a modified jump athletics game-based learning method significantly improved students' learning interest and learning outcomes in Physical Education (PJOK). This improvement is clearly

reflected in the increase between pre-test and post-test scores, supported by the N-Gain analysis, indicating not only statistical significance but also meaningful pedagogical impact. These results reinforce the argument that innovative, student-centered learning approaches are essential in overcoming low engagement and monotonous instructional practices in elementary physical education (Casey & Goodyear, 2015; Hastie et al., 2017).

Prior to the intervention, the results revealed that students exhibited limited mastery of basic jumping techniques and low learning interest. This was evident in poor motor coordination, incorrect take-off techniques, and hesitation in executing jumps. Such findings are consistent with previous research indicating that traditional, teacher-centered approaches often fail to stimulate active participation and intrinsic motivation among students (Harvey & Jarrett, 2014; Dyson et al., 2016). Low engagement in physical education is frequently associated with a lack of meaningful learning experiences, which can hinder both cognitive understanding and psychomotor development (Chen et al., 2017; Beni et al., 2017).

The implementation of the three-stage learning model—Play 1, Teach, and Play 2—proved effective in addressing these issues. In the first stage (Play 1), activities such as leapfrog and jump rope created an enjoyable and dynamic learning environment. This aligns with constructivist learning theory, which emphasizes that learning occurs more effectively when students are actively involved in meaningful activities (Piaget, 1972; Light, 2013). The playful nature of these activities stimulated students' curiosity and reduced anxiety, thereby enhancing readiness to learn (Hidi & Renninger, 2016; Lopes et al., 2018). Additionally, incorporating warm-up games has been shown to improve motor coordination and physical preparedness, which are critical for skill acquisition in athletics (Logan et al., 2018; Barnett et al., 2016). The second stage (Teach) focused on delivering structured instruction of fundamental jumping techniques, including approach run, take-off, body positioning, and landing. This stage reflects the principles of motor learning theory, where skill acquisition occurs through progressive and systematic practice (Schmidt & Lee, 2019). The structured approach allowed students to develop a clearer understanding of movement mechanics, which is essential for improving performance (Magill & Anderson, 2017). Research suggests that combining explicit instruction with active practice enhances both cognitive comprehension and psychomotor execution (Rink, 2020; Ward et al., 2018). The third stage (Play 2) integrated modified games using sacks and hula hoops arranged in a "U" formation, combined with competitive elements such as rock-paper-scissors. This stage was particularly effective in increasing student motivation and engagement. Game-based learning has been widely recognized as a powerful pedagogical strategy that promotes enjoyment, social interaction, and intrinsic motivation (Kirk, 2010; Casey et al., 2021). The incorporation of competition and teamwork further enhances student involvement and fosters collaborative skills (Hastie & Mesquita, 2016; O'Connor et al., 2020).

The observed improvement in student learning outcomes can be attributed to several key factors. First, the increase in student participation indicates that the modified learning method successfully created an inclusive and engaging learning

environment. Active participation is a crucial determinant of learning success, particularly in physical education contexts (Fairclough & Stratton, 2015; Lubans et al., 2016). Second, the improvement in students' understanding of basic jumping techniques demonstrates the effectiveness of combining structured instruction with experiential learning (Metzler, 2017; Rovegno & Dolly, 2020). Third, the increase in student motivation and learning interest highlights the importance of affective factors in the learning process. According to self-determination theory, motivation is enhanced when learning activities are perceived as enjoyable, meaningful, and autonomy-supportive (Deci & Ryan, 2017; Ntoumanis et al., 2021). The modified game-based approach provided opportunities for students to experience success, which in turn boosted their confidence and willingness to participate (Bandura, 2018; Morgan et al., 2019). Fourth, the creation of an enjoyable learning atmosphere contributed significantly to the effectiveness of the intervention. Enjoyment is a key predictor of sustained participation in physical activity and learning (Beni et al., 2017; Gråstén & Watt, 2017). By transforming traditional drills into engaging games, the learning process became more meaningful and less intimidating for students (Casey & MacPhail, 2018; Harvey et al., 2020). Fifth, the increase in students' confidence in performing athletic movements indicates that the intervention supported the development of self-efficacy. Self-efficacy plays a critical role in determining students' willingness to attempt and persist in challenging tasks (Bandura, 2018; Feltz et al., 2020). The progressive and supportive learning environment enabled students to gradually build confidence and improve their performance. Sixth, the improvement in jumping technique performance demonstrates that the modified learning method not only influenced affective outcomes but also enhanced psychomotor skills. This finding is consistent with previous studies showing that game-based learning can effectively improve both skill acquisition and physical performance (Harvey et al., 2014; Casey et al., 2021).

The results of this study strongly support the concept of game modification as an effective instructional strategy. Game modification involves adapting existing games or creating new ones to suit students' developmental levels and learning objectives (Masgumelar et al., 2019; Prayoga et al., 2020). Such modifications simplify complex skills, making them more accessible and enjoyable for learners (Light, 2013; Dyson et al., 2016). This approach is particularly relevant in elementary education, where students require engaging and developmentally appropriate learning experiences (Logan et al., 2018; Barnett et al., 2016).

Despite these positive findings, this study has several limitations. The relatively short duration of the intervention may limit the long-term generalizability of the results. Additionally, the study focused on a single class with a limited sample size, which may not fully represent broader populations. Furthermore, the measurement of learning interest relied on a single instrument, which may not capture the complexity of students' affective responses. Future research is recommended to involve larger samples, longer intervention periods, and more comprehensive measurement tools to validate and extend these findings (Creswell & Creswell, 2018; Cohen et al., 2018).

In conclusion, the implementation of a modified jump athletics game-based learning method has proven effective in improving students' learning interest and performance in physical education. The integration of play, structured instruction, and modified games creates a holistic learning experience that enhances cognitive, affective, and psychomotor development. These findings provide strong empirical support for the adoption of innovative, game-based instructional strategies in elementary physical education.

CONCLUSION

Based on the results of the study and statistical analysis, it can be concluded that the implementation of a learning method based on the modification of jump athletics games has a significant and positive effect on improving the learning interest of fifth-grade students at SDN Cibodas 3. Empirically, this is evidenced by the increase in the average score of students' learning interest from 103.35 in the pre-test to 128.42 in the post-test, indicating a substantial improvement after the application of the modified game-based learning treatment.

Furthermore, the results of hypothesis testing using the paired sample t-test reinforce these findings. The calculated t-value ($t = 9.88$) was significantly higher than the critical t-table value ($t = 2.03$) at a significance level of $\alpha = 0.05$ with 35 degrees of freedom. This result confirms that H_0 is rejected and H_1 is accepted, meaning that there is a statistically significant difference between pre-test and post-test scores. Therefore, the modified jump athletics game-based learning method can be considered effective in enhancing students' learning interest in Physical Education (PJOK).

From a conceptual perspective, the success of this method lies in its ability to integrate elements of play, structured instruction, and interactive activities into the learning process. This approach creates a more engaging, enjoyable, and student-centered learning environment, which encourages active participation and reduces boredom often associated with conventional teaching methods. In addition, the implementation of this method contributes to improving students' understanding of basic jumping techniques, enhancing their motor coordination, and increasing their confidence in performing athletic movements.

Overall, this study demonstrates that the use of modified game-based learning not only improves affective aspects such as learning interest and motivation but also supports the development of psychomotor skills in athletics. Thus, this method is highly recommended as an innovative instructional strategy for improving the quality of PJOK learning, particularly at the elementary school level.

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