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The Implementation of Modified Traditional Engklek Game-Based Locomotor Learning to Improve Elementary School Students' Movement Skills

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Abstrac: This study examined the effectiveness of locomotor learning (jumping) based on a modified traditional Engklek game in improving the movement skills of elementary school students at SDN Murung Sari 2 Amuntai. A quantitative approach with a one-group pretest–posttest design was employed. The participants were 48 second-grade students selected through total sampling. Data were collected using a locomotor movement skill assessment instrument based on established learning indicators and analyzed using descriptive statistics and paired-sample *t*-tests. The results demonstrated a significant improvement in students' locomotor movement skills after the intervention, as reflected by higher posttest scores than pretest scores ($p < 0.05$). The modified Engklek game not only enhanced jumping performance but also improved balance, movement coordination, lower-limb strength, and active participation during physical education activities. Therefore, this learning approach can serve as an effective and engaging strategy for developing fundamental locomotor skills in elementary school students.

Keyword: Jumping, Locomotor Skills, Movement Skills, Traditional Engklek Game

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INTRODUCTION

Education is a fundamental process that shapes the quality of human resources by developing students' knowledge, skills, attitudes, and values required to adapt to the demands of the twenty-first century. Modern education emphasizes not only academic achievement but also the holistic development of learners through meaningful and student-centered learning experiences. Since every student has different abilities, interests, and learning characteristics, instructional strategies should provide equal opportunities for active participation and optimal development (Mufarrihah et al., 2025). Consequently, teachers are expected to implement innovative learning approaches that encourage students to become actively engaged in the learning process.

Physical Education, Sports, and Health (PESH) is an integral component of the educational curriculum that utilizes physical activity as a medium for developing physical fitness, motor competence, cognitive ability, emotional stability, social interaction, and healthy lifestyles. Rather than focusing solely on physical performance, PESH aims to foster lifelong physical activity habits and positive character values through enjoyable and meaningful movement experiences. Therefore, selecting appropriate instructional strategies is essential to improve students' motivation, participation, and movement competence (Ramadhani et al., 2025).

One of the fundamental competencies that should be mastered by elementary school students is locomotor movement skills, which include walking, running, and jumping. These basic movement patterns serve as the foundation for more advanced motor skills and support children's physical development and participation in various sports activities. According to (Budiman & Dewi, 2022), locomotor skill development is influenced by students' physical maturity, learning experiences, and the quality of movement practice provided during instruction. However, classroom observations and previous studies indicate that many elementary school students still experience difficulties in performing locomotor movements effectively due to monotonous teaching methods, limited instructional media, and insufficient opportunities for active practice.

Recent educational research suggests that game-based learning provides an effective solution for improving students' engagement and motor skill development. Learning activities integrated with games create enjoyable experiences that encourage students to participate actively while simultaneously developing physical, cognitive, and social competencies (Rifai, 2020). Traditional games are particularly valuable because they combine physical movement with cultural values such as cooperation, discipline, responsibility, fairness, and social interaction. Nevertheless, the increasing popularity of digital entertainment has gradually reduced children's participation in traditional games, limiting their opportunities to develop fundamental movement skills through natural play activities (Andriadi, 2023).

Previous studies have shown that the traditional Engklek game can improve students' locomotor skills, gross motor development, balance, and learning motivation. In addition, traditional game-based learning has been reported to increase students' engagement and participation in physical education activities (Jannah et al., 2024). However, these studies mainly focused on the implementation of the traditional form of Engklek or on children's general motor development. Limited studies have specifically examined the implementation of a modified Engklek game that systematically adjusts the game rules, movement patterns, and level of difficulty to support locomotor learning in elementary school physical education. Therefore, the novelty of this study lies in the development and implementation of a modified traditional Engklek game as a structured instructional strategy to improve elementary school students' locomotor movement skills while maintaining the educational and cultural values of the traditional game (Hilmi & Kastrena, 2025).

Preliminary observations conducted at SDN Murung Sari 2 Amuntai revealed that students' locomotor skills, particularly jumping ability, had not yet developed optimally. Physical Education lessons were still dominated by conventional teaching approaches with limited variation in learning media and minimal integration of game-based activities. As a result, many students demonstrated low participation, reduced enthusiasm, and limited opportunities to practice

locomotor movements in meaningful contexts. These conditions indicate the need for innovative instructional strategies capable of creating active and student-centered learning environments.

Based on these findings, implementing a modified Engklek game is expected to become an effective instructional alternative for improving elementary school students' locomotor skills. The integration of traditional games into Physical Education learning not only provides enjoyable movement experiences but also promotes active participation, collaboration, and the preservation of local cultural heritage. Therefore, this study aims to investigate the effectiveness of modified traditional Engklek game-based learning in enhancing the locomotor (jumping) skills of students at SDN Murung Sari 2 Amuntai. The findings are expected to contribute to the development of innovative Physical Education practices that improve motor competence while fostering students' motivation, engagement, and positive learning experiences.

METHOD

Research Design

This study employed a quantitative approach using an experimental method to examine the effectiveness of modified traditional *Engklek* game-based locomotor learning in improving elementary school students' locomotor movement skills. The research adopted a one-group pretest–posttest design, in which the same group of participants was assessed before and after the intervention. This design enables researchers to evaluate changes in participants' locomotor movement skills by comparing pre-intervention and post-intervention measurements, thereby determining the effectiveness of the implemented learning model (Creswell & Creswell, 2018).

Participants

The research was conducted at SDN Murung Sari 2 Amuntai from April to May 2026. The study involved 48 second-grade students from Classes IIA and IIB. Participants were selected using a purposive sampling technique because they possessed characteristics relevant to the objectives of the study, allowing the researchers to obtain information from participants who were most appropriate for addressing the research questions (Campbell et al., 2020). All second-grade students were included because they were at the fundamental stage of locomotor skill development, making them suitable participants for evaluating the implementation of a modified traditional *Engklek* game-based locomotor learning program.

Instrument

Data were collected using three research instruments: a locomotor skill test, an observation sheet, and documentation. The locomotor skill test assessed students' jumping performance based on movement technique, coordination, balance, and movement accuracy using indicators adapted from (Jannah et al., 2024). Prior to data collection, the instrument underwent content validation by three experts in physical education and learning assessment to ensure its relevance and clarity. The content validity evaluation indicated that all assessment indicators were appropriate for measuring elementary school students' locomotor movement skills. Furthermore, the instrument demonstrated good internal consistency, with a Cronbach's alpha coefficient exceeding the recommended threshold of 0.70, indicating acceptable reliability (Taber, 2018). Observation sheets were used to record students' participation, engagement, and responses throughout the learning process, while photographs and video recordings served as supporting documentation to strengthen the research findings.

Research Procedure and Data Collection

The research procedure began with a pretest to determine students' initial locomotor jumping abilities. Subsequently, students participated in a series of learning activities using a modified traditional Engklek game. The modifications involved changes to the playing field, game rules, movement variations, and difficulty levels to align the activities with the Physical Education, Sports, and Health (PJOK) learning outcomes. These modifications were designed to provide students with more opportunities to practice locomotor movements through enjoyable and repetitive activities. At the end of the intervention, a posttest was administered to evaluate improvements in students' locomotor skills.

Data Analysis

The collected data were analyzed using descriptive and inferential statistics. Descriptive analysis was used to present the mean, maximum score, minimum score, and percentage distribution of students' learning outcomes. Prior to hypothesis testing, normality and homogeneity tests were conducted to verify the assumptions required for parametric analysis. Differences between pretest and posttest scores were then analyzed using a Paired Sample *t*-test with IBM SPSS Statistics version 25 at a significance level of 0.05. The results of this analysis were used to determine the effectiveness of modified traditional Engklek game-based locomotor learning in enhancing elementary school students' locomotor movement skills.

RESULT

Research Data Description

This study was conducted to evaluate the effectiveness of locomotor learning (jumping) through a modified traditional *Engklek* game in improving the locomotor movement skills of second-grade students at SDN Murung Sari 2 Amuntai. A total of 48 students participated in the study and completed both the pretest and posttest assessments.

Table 1. Descriptive Statistics of Research Data

Variable	N	Minimum	Maximum	Mean	SD
Pretest	48	33	67	56.77	9.939
Posttest	48	55	89	73.62	7.136

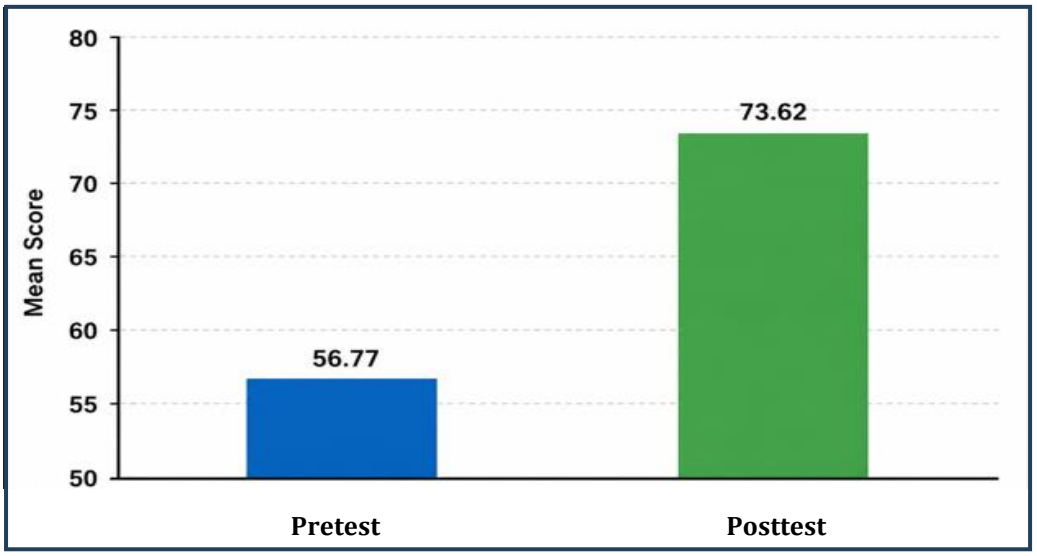

Figure 1. Comparison of Mean Pretest and Posttest Scores of Students' Locomotor Movement Skills

Table 1 demonstrates a substantial improvement in students' locomotor movement skills following the implementation of the modified traditional *Engklek* game. Before the intervention, the participants obtained an average score of 56.77, with scores ranging from 33 to 67. After participating in the learning activities, the mean score increased to 73.62, while the score range improved to 55–89. Furthermore, the standard deviation decreased from 9.939 to 7.136, indicating that students' performances became more consistent after the intervention.

Assumption Testing

Prior to hypothesis testing, normality and homogeneity analyses were performed to verify the assumptions required for parametric statistical analysis.

Table 2. Shapiro–Wilk Normality Test

Variable	Statistic	df	Sig.
Pretest	0.973	48	0.318
Posttest	0.973	48	0.336

The normality assumption was evaluated using the Shapiro–Wilk test because the sample size consisted of fewer than 50 participants. As shown in Table 2, the pretest scores yielded a Shapiro–Wilk value of 0.973 with a significance level of .318, whereas the posttest scores produced a Shapiro–Wilk value of 0.973 with a significance level of .336. Since the significance values for both measurements exceeded the criterion of .05, the pretest and posttest data were considered normally distributed. Accordingly, the normality assumption was met, allowing the use of a paired-samples *t*-test to determine whether the modified traditional *Engklek* game-based locomotor learning significantly improved students' locomotor movement skills.

Table 3. Homogeneity Test

Levene Statistic	df1	df2	Sig.
3.688	1	94	0.058

The homogeneity test yielded a significance value of 0.058, which is greater than 0.05, indicating homogeneous variance between the datasets. Consequently, the assumptions for conducting a parametric hypothesis test were satisfied.

Hypothesis Testing

A Paired Sample *t*-Test was employed to determine whether the modified traditional *Engklek* game significantly improved students' locomotor movement skills.

Table 4. Paired Sample *t*-Test Results

Comparison	Mean Difference	SD	t	df	Sig. (2-tailed)
Pretest – Posttest	-16.854	9.381	-12.448	47	0.000

As presented in Table 4, the significance value was 0.000, which is lower than the 0.05 threshold. This finding indicates a statistically significant difference between students' locomotor movement skills before and after the intervention. The mean difference of 16.854 points demonstrates a considerable improvement in students' performance following participation in the modified traditional *Engklek*-based learning activities. Overall, the findings confirm that integrating a modified traditional *Engklek* game into locomotor learning positively influences elementary school students' movement skills. The higher posttest mean score, improved score distribution, and significant statistical results collectively suggest that this learning approach effectively enhances students' locomotor abilities while providing an engaging and meaningful learning experience.

DISCUSSION

The findings demonstrate that implementing locomotor learning (jumping) through a modified traditional Engklek game significantly improved the locomotor movement skills of second-grade students at SDN Murung Sari 2 Amuntai. This improvement is reflected in the increase in the mean score from 56.77 during the pretest to 73.62 in the posttest, indicating that integrating traditional games into physical education learning effectively enhances students' locomotor performance. The improvement suggests not only better jumping skills but also greater student engagement through active and enjoyable learning experiences.

The effectiveness of the modified Engklek game can be explained by its movement characteristics, which naturally involve repeated jumping, body coordination, balance control, and spatial movement. These repetitive activities provide students with extensive movement practice compared with conventional instructional methods, allowing them to refine movement patterns while strengthening fundamental motor skills. This finding is consistent with Motor

Learning Theory, which states that repeated and meaningful practice facilitates the acquisition and refinement of motor skills through continuous feedback and movement adaptation. Consequently, students gradually develop better coordination, balance, and movement accuracy through repeated participation in structured game activities. This finding also (Pratiwi & Arifin, 2023), who argued that active student participation is a key determinant of learning effectiveness because meaningful learning experiences facilitate skill acquisition and long-term retention.

The improvement in locomotor skills also indicates that modified traditional games represent an appropriate instructional strategy for elementary school students. According to Constructivist Learning Theory, children learn more effectively when they actively construct knowledge through direct experience rather than passively receiving information from teachers. The modified Engklek game allows students to explore movement, solve movement-related problems, and learn through repeated practice in meaningful situations. Consequently, integrating game elements into physical education creates a more engaging learning environment, increases learning motivation, and minimizes boredom during classroom activities. These findings are consistent with (Andriadi, 2023), who reported that game-based fundamental movement learning enhances students' motivation while enriching their motor learning experiences.

Furthermore, the present findings reinforce previous studies demonstrating that repeated jumping activities in traditional Engklek games contribute to the development of gross motor abilities, particularly balance, coordination, and movement control. The modified game provides opportunities for students to perform various movement patterns within an enjoyable and low-pressure environment, enabling them to practice naturally without experiencing excessive psychological stress. This finding is also supported by Game-Based Learning Theory, which emphasizes that enjoyable learning activities increase students' motivation, engagement, and willingness to participate actively in learning tasks. As a result, students develop not only locomotor competence but also confidence, concentration, and decision-making abilities during learning activities (Wijaya & Fitri, 2023).

Beyond improving locomotor performance, the modified traditional Engklek game also contributes to students' social development. Throughout the learning process, students are required to follow game rules, wait for their turns, cooperate with peers, and demonstrate respect for others. These interactions create a holistic learning experience by promoting physical competence alongside positive character development, including sportsmanship, discipline, responsibility, and collaborative skills. This finding is consistent with (Hilmi & Kastrena, 2025), who concluded that modified traditional games enhance students' physical literacy through improvements in movement competence, learning motivation, self-confidence, and active participation in physical education (Firmansyah et al, 2019).

Although most previous studies have reported positive effects of traditional games on students' motor development, several researchers have suggested that traditional games alone may not significantly improve locomotor skills unless they are supported by structured learning objectives and teacher guidance. In the present study, the positive outcomes may be attributed to the systematic modification of the Engklek game, including adjustments to the movement patterns, game rules, and levels of difficulty, enabling students to practice locomotor skills more effectively while remaining actively engaged throughout the learning process (Hilmi & Kastrena, 2025).

The effectiveness of this instructional model is further supported by the research design and measurement instruments employed in this study. Students' locomotor abilities were objectively assessed using a pretest-posttest design based on indicators of jumping technique, body balance, movement coordination, and task completion. Improvements across all assessment indicators demonstrate that the modified traditional Engklek game provides appropriate movement stimuli for developing fundamental locomotor skills among elementary school students (Permata et al., 2025).

Despite these positive findings, this study has several limitations. The study involved only second-grade students from one elementary school and employed a one-group pretest-posttest design without a control group, which may limit the generalizability of the findings and the ability

to compare the intervention with other instructional methods. Furthermore, the intervention was conducted over a relatively short period, so the long-term effects of the modified Engklek game were not examined. Future studies are recommended to include larger samples from different schools, apply experimental designs with control groups, and investigate the long-term impact of modified traditional games on students' locomotor development (Butarbutar et al., 2024).

Overall, the findings establish a clear relationship between modified traditional Engklek-based learning and improved locomotor movement skills. Systematic and repetitive jumping activities presented through a game-based approach provide a more effective learning experience than teacher-centered instruction alone. Therefore, incorporating traditional games into physical education not only enhances learning outcomes but also contributes to the preservation of local cultural heritage while addressing the educational demands of twenty-first-century learning environments.

CONCLUSION

The implementation of locomotor learning (jumping) through a modified traditional *Engklek* game effectively improved the locomotor movement skills of second-grade students at SDN Murung Sari 2 Amuntai. The significant improvement in posttest performance indicates that integrating play-based activities with instructional objectives represents an effective strategy for developing fundamental movement skills while encouraging students' active participation throughout physical education learning. The modified traditional *Engklek* game can therefore be recommended as an alternative instructional approach for locomotor learning in elementary schools because it creates a more engaging, meaningful, and student-centered learning environment. Future studies are encouraged to investigate the application of this model across different educational levels, movement competencies, or larger participant populations to obtain more comprehensive evidence regarding its effectiveness and broader educational impact.

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