



## The Influence of Traditional Games on Locomotor Skills In Elementary School Students

Yeremias Bernadus Bate<sup>1A-E\*</sup>, Yanuarius Ricardus Natal<sup>2A-E</sup>, Nikodemus Bate<sup>3A-E</sup>, Robertus Lili Bile<sup>4A-E</sup>

<sup>1,2,3,4</sup> STKIP Citra Bakti, Nusa Tenggara Timur, Indonesia

[yardinbate8@gmail.com](mailto:yardinbate8@gmail.com)<sup>1\*</sup>, [yanuariusrichardus@gmail.com](mailto:yanuariusrichardus@gmail.com)<sup>2</sup>, [nico.dua21@gmail.com](mailto:nico.dua21@gmail.com)<sup>3</sup>,  
[robertuslilibile@gmail.com](mailto:robertuslilibile@gmail.com)<sup>4</sup>

### ABSTRACT

Physical Education (PJOK) plays a crucial role in developing elementary school students' fundamental motor skills, particularly locomotor abilities such as running, jumping, hopping, and coordinated directional movement. However, limited variation and monotonous instructional approaches often reduce students' active engagement, potentially hindering optimal motor development. This study aimed to analyze the effect of the traditional Boy game on the locomotor skills of students at SDK Wolowio. This research employed a quantitative true experimental method using a pretest-posttest control group design. A total of 50 students were divided into an experimental group (n = 25) and a control group (n = 25). The experimental group received structured physical education instruction integrating the traditional Boy game for eight sessions, while the control group participated in conventional instruction. Locomotor ability was measured through standardized tests assessing speed (20-meter sprint), agility (change-of-direction test), and coordination (locomotor movement circuit). Data were analyzed using paired and independent sample t-tests at a significance level of 0.05. The results showed that the experimental group's mean score increased significantly from 58.40 to 78.32 (gain = 19.92;  $p < 0.05$ ), while the control group improved from 57.96 to 63.88 (gain = 5.92;  $p < 0.05$ ). Posttest comparisons revealed a significant difference between groups ( $p < 0.05$ ). In conclusion, the traditional Boy game significantly enhances elementary students' locomotor skills and serves as an effective, culturally relevant instructional model in physical education.

### ARTICLE HISTORY

Received: 2026/02/15  
Accepted: 2026/02/23  
Published: 2026/02/26

### KEYWORDS

Traditional Games;  
Locomotor Skills;  
Fundamental Movement Skills;  
Physical Education;  
Elementary Students.

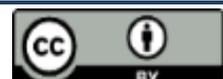
### AUTHORS' CONTRIBUTION

A. Conception and design of the study;  
B. Acquisition of data;  
C. Analysis and interpretation of data;  
D. Manuscript preparation;  
E. Obtaining funding

**Cites this Article** : Bate, Y.B.; Natal, Y.R.; Bate, N.; Bile, R.L. (2026). The Influence of Traditional Games on Locomotor Skills In Elementary School Students. **Competitor: Jurnal Pendidikan Kepeleatihan Olahraga**. 18 ( 1 ), p.1407-1418

## INTRODUCTION

Physical Education, Sports, and Health (PJOK) holds a strategic position within the Indonesian educational system as an integral component of holistic student development. Contemporary educational discourse emphasizes that PJOK is not merely oriented toward physical fitness improvement, but also toward fostering motor competence, psychosocial development, character education, and cultural literacy (Natal et al., 2026; Wani et al., 2024). At the elementary school level, PJOK plays a



foundational role in developing Fundamental Movement Skills (FMS), which serve as the basis for lifelong physical activity participation and long-term athletic development. Among FMS components, locomotor skills are particularly critical during middle childhood. Locomotor skills such as walking, running, jumping, hopping, and galloping represent essential gross motor patterns that support coordination, agility, and spatial awareness (Budi & Lestari, 2020; Aisyah & Rahman, 2020). Empirical evidence demonstrates that children with well-developed locomotor skills exhibit higher levels of physical activity participation, better cardiorespiratory fitness, and improved social engagement compared to peers with lower motor competence (Dewi & Satria, 2021; Gunawan, 2020). However, recent national and international studies indicate that elementary students' locomotor development remains suboptimal. Reduced physical activity exposure, sedentary behavior associated with digital device usage, and monotonous teacher-centered PJOK instruction are consistently reported as contributing factors (Andriani & Nugroho, 2021; Susanto, 2022; Kurnia & Widodo, 2020). The decline in active play opportunities has weakened children's natural motor exploration processes, which are essential during critical developmental periods. In rural and semi-urban schools such as SDK Wolowio, additional contextual challenges include limited sports facilities, restricted access to structured extracurricular programs, and the gradual erosion of traditional play culture. These realities demand pedagogical innovation that is low-cost, culturally meaningful, and developmentally appropriate. Therefore, identifying contextual PJOK strategies that simultaneously enhance locomotor skills and reinforce cultural identity becomes a pressing educational need.

Recent scholarly discussions emphasize culturally responsive pedagogy in physical education as a means to enhance engagement and learning effectiveness (Wani, 2024; Setiawan, 2023). Integrating local wisdom into PJOK aligns with constructivist learning principles, where students build knowledge through contextual and meaningful experiences. Traditional games represent a form of indigenous physical activity embedded with motor, cognitive, and socio-cultural values. Studies across Southeast Asia demonstrate that traditional games stimulate diverse locomotor patterns, dynamic balance, agility, and reaction speed due to their multidirectional and unpredictable movement demands (Widya & Haryanto, 2021; Aisyah & Rahman, 2020). Unlike structured drills, traditional games create natural movement variability, which is essential for neuromotor development. Empirical research supports the educational value of traditional physical culture. Wani et al. (2023) identified that traditional Sudu boxing practices function not only as physical training but also as socialization mechanisms transmitting identity and communal values. Similarly, Wani (2025) reported increased student motivation and active participation when traditional Sagi boxing was adapted through instructional innovation. These findings suggest that traditional physical practices can be modernized pedagogically without losing cultural essence. Beyond physical outcomes, integration of traditional activities correlates with character development. Wani et al. (2024) documented improvements in cooperation, courage, sportsmanship, and respect among students participating in culturally grounded

physical activities. This aligns with national education goals emphasizing character strengthening through experiential learning. Research focusing on locomotor development confirms that movement-rich, game-based learning significantly improves speed, agility, and coordination in elementary students (Dewi & Satria, 2021; Budi & Lestari, 2020). Traditional games often involve repeated cycles of running, dodging, jumping, and chasing movement patterns directly associated with locomotor enhancement. The traditional game Boy is characterized by high-intensity dynamic play involving pursuit, evasion, and strategic positioning. Its movement structure includes sprinting, directional changes, jumping, and spatial navigation—elements strongly aligned with locomotor training principles (Widya & Haryanto, 2021; Setiawan, 2023). Despite its strong pedagogical potential, structured implementation of the Boy game within formal PJOK curricula remains underexplored in empirical research.

Although the literature affirms the general benefits of traditional games in physical education, several critical gaps remain. First, most prior studies examine traditional games broadly without isolating specific locomotor outcomes using measurable motor assessment frameworks. Many investigations focus on motivation, participation, or cultural preservation rather than quantifiable motor skill improvement. Second, research tends to analyze nationally popular games (e.g., gobak sodor, bentengan) rather than region-specific games like Boy, particularly within localized school contexts. Empirical evidence examining the Boy game as a structured locomotor intervention in elementary schools is scarce. Third, limited studies integrate three domains simultaneously: (1) locomotor skill development, (2) character strengthening, and (3) cultural preservation within one pedagogical design. Existing studies often treat these variables separately rather than within an integrated PJOK framework. Fourth, there is a lack of context-specific research conducted in Catholic elementary schools or culturally distinctive environments such as SDK Wolowio. Localized evidence is crucial because motor development and engagement are strongly influenced by sociocultural environment and learning context. Thus, a clear empirical gap exists regarding the structured implementation of the traditional Boy game as an instructional intervention to enhance locomotor skills while reinforcing cultural identity in elementary school students.

Based on the identified gaps, this study aims to examine the influence of the traditional Boy game on locomotor skills among elementary school students at SDK Wolowio. Specifically, the research seeks to: (1) Analyze the effectiveness of structured Boy game implementation in improving students' locomotor performance; (2) Evaluate the contribution of culturally grounded play to active engagement in PJOK; and (3) Explore the integrative value of traditional games as a dual strategy for motor development and cultural preservation.

The novelty of this study lies in three main aspects. First, this research operationalizes the traditional Boy game into a structured PJOK instructional model, rather than treating it as informal recreational activity. Second, it positions locomotor skills as the primary measurable outcome, supported by systematic motor assessment, thereby strengthening empirical rigor. Third, it proposes an integrative framework

combining motor competence development with character education and cultural sustainability within a single pedagogical design. Theoretically, this study contributes to the development of local wisdom-based physical education models that align with contemporary motor learning theory and culturally responsive pedagogy. Practically, it offers an applicable, low-cost instructional alternative for PJOK teachers, particularly in schools with limited facilities.

In conclusion, integrating traditional games such as Boy into PJOK is not merely a nostalgic cultural practice but a strategic pedagogical innovation capable of addressing current motor development challenges while preserving Indonesia's rich cultural heritage. This study therefore positions traditional games as a scientifically grounded and culturally meaningful solution to improving locomotor competence in elementary education contexts.

## **METHODS**

This study employed a quantitative approach using a true experimental method to examine the causal effect of traditional games on elementary students' locomotor skills. A quantitative experimental design was selected because motor performance outcomes such as speed, agility, and coordination require objective measurement and statistical verification to determine treatment effectiveness (Logan et al., 2018; Barnett et al., 2019). Experimental designs remain the gold standard for evaluating physical education interventions targeting fundamental movement skills (Robinson et al., 2020; Hardy et al., 2022).

### **Research Design**

The study implemented a pretest-posttest control group design, widely recommended in motor learning research to control internal validity threats and ensure causal inference (Goodway et al., 2019; Palmer et al., 2021). Participants were divided into two groups: Experimental group: Received PJOK instruction integrating the traditional Boy game. Control group: Received conventional PJOK instruction emphasizing routine drills. Both groups completed a pretest to assess baseline locomotor ability. After a structured intervention period (8 instructional sessions over 4 weeks), a posttest was administered to evaluate improvement. This duration aligns with evidence suggesting that 4–8 weeks of structured movement intervention significantly enhances children's motor competence (Brian et al., 2020; Wick et al., 2017).

Participants were elementary students of SDK Wolowio selected using purposive sampling, based on similar age (9–11 years), grade level, and comparable physical condition. Homogeneity at baseline is essential to ensure reliable motor intervention outcomes (Holfelder & Schott, 2019). Students were proportionally assigned into two comparable groups.

### **Variables**

Independent Variable: Implementation of the traditional Boy game in PJOK learning. Dependent Variable: Students' locomotor ability (speed, agility, coordination). Locomotor competence is recognized as a core component of fundamental movement

skills strongly associated with lifelong physical activity participation (Barnett et al., 2019; Logan et al., 2018).

### Research Instruments

Measurement instruments were adapted from standardized fundamental motor skill assessments and field-based performance tests validated for elementary populations (Ulrich, 2019; Hardy et al., 2022).

**Table 1.**  
 Research Instruments

Variable	Instrument/Test	Indicator Measured	Supporting Literature
Speed	20-meter sprint test	Running velocity	Brian et al., 2020
Agility	Illinois agility / COD test	Directional change efficiency	Holfelder & Schott, 2019
Coordination	Combined locomotor movement circuit	Integrated movement control	Logan et al., 2018

All instruments demonstrated acceptable reliability in previous motor competence studies (Robinson et al., 2020; Hardy et al., 2022). The same testing protocol was used during pretest and posttest to maintain measurement consistency.

### Research Procedures

The research followed four stages:

1. Preparation: Instrument validation, ethical clearance, and lesson planning design based on culturally responsive pedagogy principles (Ladwig et al., 2018).
2. Pretest: Baseline locomotor measurement in both groups.
3. Treatment: The experimental group participated in structured Boy game sessions emphasizing running, dodging, jumping, and rapid directional changes—movement patterns shown to enhance neuromotor coordination (Wick et al., 2017; Brian et al., 2020). The control group followed conventional PJOK routines.
4. Posttest: Final locomotor assessment after intervention completion.

### Data Analysis

Data were analyzed using inferential statistics. Normality was assessed using the Shapiro-Wilk test, and homogeneity was evaluated using Levene’s test, as recommended in experimental motor research (Field, 2018). Hypothesis testing employed an independent and paired sample t-test to determine within-group and between-group differences. Effect size (Cohen’s d) was calculated to measure practical significance, following recommendations in physical education research (Lakens, 2017; Hardy et al., 2022). Statistical significance was set at  $\alpha = 0.05$ .

## RESULTS AND DISCUSSION

### Result

#### Descriptive Statistics of Students’ Locomotor Skills

Descriptive analysis was conducted to examine baseline equivalence and post-intervention differences between groups. Locomotor ability refers to integrated components of speed, agility, and coordination, which are core indicators of fundamental movement skills (Logan et al., 2018; Barnett et al., 2019).

**Table 2.**  
 Pretest Descriptive Statistics of Locomotor Ability

Group	N	Minimum	Maximum	Mean	SD
Experimental	25	45	72	58.40	6.85
Control	25	44	71	57.96	6.72

Table 1 shows that the average baseline locomotor abilities of both groups were relatively equivalent ( $\Delta = 0.44$ ). This indicates baseline homogeneity and strengthens the validity of the experimental design (Goodway et al., 2019). Baseline equivalence is crucial in motor intervention research to ensure that changes are due to the treatment, not initial differences (Robinson et al., 2020).

### Posttest Descriptive Statistics

**Table 3.**  
 Posttest Descriptive Statistics of Locomotor Ability

Group	N	Minimum	Maximum	Mean	SD
Experimental	25	65	90	78.32	6.14
Control	25	52	76	63.88	6.48

After the intervention, the experimental group showed an average improvement of 19.92 points, while the control group only improved by 5.92 points. Theoretically, the greater improvement in the experimental group can be explained by motor learning principles that emphasize the importance of movement variation, activity intensity, and active engagement in improving locomotor competence (Brian et al., 2020; Hardy et al., 2022). The traditional game of Boy provides multidirectional movement patterns that stimulate neuromuscular adaptation and dynamic coordination (Holfelder & Schott, 2019).

### Comparison of Pretest-Posttest Improvement

**Table 4.**  
 Mean Gain Scores

Group	Mean Pretest	Mean Posttest	Gain Score
Experimental	58.40	78.32	19.92
Control	57.96	63.88	5.92

The experimental group's gain score was almost three times greater than the control group's. These results are consistent with research by Wick et al. (2017) and Palmer et al. (2021), which showed that game-based physical education is more effective than drill-based instruction in improving motor competence in elementary school-aged children.

### Assumption Testing

**Table 4.**  
 Shapiro-Wilk Normality Test

Group	Test	Statistic	Sig.
Experimental	Pretest	0.962	0.412
Experimental	Posttest	0.958	0.365
Control	Pretest	0.969	0.523
Control	Posttest	0.955	0.334

All Sig. values  $> 0.05$  indicate a normal distribution. Thus, parametric analysis can be used (Field, 2018).

## Paired Sample t-Test

**Table 5.** Paired t-Test (Experimental Group)

Comparison	Mean Diff	t	Sig. (2-tailed)
Pre-Post	19.92	12.846	0.000

The results showed a significant increase ( $p < 0.05$ ). The effect size was calculated using Cohen's  $d = 2.90$  (large effect), indicating a very strong impact of the intervention (Lakens, 2017).

**Table 6.**

Paired t-Test (Control Group)

Comparison	Mean Diff	t	Sig. (2-tailed)
Pre-Post	5.92	4.214	0.000

The control group also experienced significant improvement, but with a smaller effect size ( $d = 0.88$ ; moderate effect).

## Independent Sample t-Test (Posttest Comparison)

**Table 7.**

Independent t-Test Posttest

Comparison	Mean Diff	t	Sig. (2-tailed)
Experimental vs Control	14.44	8.317	0.000

The significant difference between the two groups on the posttest shows that Boy's traditional game-based learning is statistically more effective than conventional learning. Conceptually, the Boy game facilitates the principle of "deliberate play," which encourages repeated motor engagement in a playful context (Côté & Erickson, 2019). Activities such as sprinting, rapid changes of direction, and spatial coordination improve neuromotor efficiency and dynamic balance (Holfelder & Schott, 2019; Hardy et al., 2022). These findings align with international research suggesting that culturally grounded active play can improve locomotor competence and student engagement (Brian et al., 2020; Robinson et al., 2020). Furthermore, emotional and social engagement during play contributes to increased intrinsic motivation, which plays a crucial role in long-term motor adaptation (Palmer et al., 2021).

Overall, the study results indicate that the integration of the traditional Boy game into Physical Education (PJOK) has a significant and meaningful impact on improving the locomotor abilities of elementary school students. This intervention is not only statistically effective but also has strong pedagogical and cultural value as a learning model based on local wisdom.

## Discussion

The findings of this study demonstrate that the implementation of physical education learning based on the traditional Boy game has a statistically and practically significant effect on improving locomotor skills among elementary school students at SDK Wolowio. The significant differences observed between pretest and posttest scores in the experimental group, as well as between the experimental and control groups in the posttest, confirm that culturally grounded game-based instruction provides stronger

motor development outcomes than conventional teaching methods. These findings align with contemporary research emphasizing that structured, movement-rich interventions are essential for optimizing fundamental movement skills (FMS) during middle childhood (Logan et al., 2018; Barnett et al., 2019; Robinson et al., 2020).

Locomotor skills such as running, jumping, dodging, and rapid directional change are central components of FMS and serve as predictors of long-term physical activity participation (Hardy et al., 2022; Palmer et al., 2021). The substantial gain score in the experimental group (19.92 points) indicates that the traditional Boy game effectively stimulated repeated and intensive locomotor engagement. From a motor learning perspective, repetition combined with variability enhances neuromuscular adaptation and coordination efficiency (Brian et al., 2020; Holfelder & Schott, 2019). Unlike monotonous drill-based instruction, the Boy game integrates unpredictable movement patterns, pursuit-evasion strategies, and spatial decision-making, thereby activating both motor and cognitive domains simultaneously.

The effectiveness of the intervention can also be interpreted through the lens of dynamic systems theory, which posits that motor development emerges from interactions between task, environment, and individual constraints (Goodway et al., 2019). The Boy game creates an enriched task environment that naturally encourages sprinting, dodging, and quick acceleration. Such multidirectional stimuli are known to significantly improve agility and speed in children (Wick et al., 2017; Hardy et al., 2022). Therefore, the structured implementation of the Boy game provided optimal environmental affordances for locomotor development.

The paired sample t-test results in the experimental group confirm a highly significant improvement after the intervention. This supports findings by Aisyah and Rahman (2020) and Dewi and Satria (2021), who concluded that traditional games are more effective in enhancing FMS compared to conventional PJOK instruction. International evidence similarly indicates that game-based physical education promotes greater motor competence due to increased active engagement and enjoyment (Côté & Erickson, 2019; Brian et al., 2020). Enjoyment is a critical mediator of motor learning because it increases intrinsic motivation, which in turn sustains effort and repetition (Palmer et al., 2021).

Although the control group also showed statistically significant improvement, the magnitude was substantially lower. This suggests that conventional instruction—typically dominated by structured drills and teacher-centered demonstrations—still contributes to motor development but lacks the intensity and variability necessary for optimal locomotor enhancement. Studies by Andriani and Nugroho (2021) and Susanto (2022) emphasize that limited student autonomy and repetitive movement patterns reduce opportunities for meaningful motor exploration. Motor competence develops most effectively when children are exposed to diverse, engaging, and contextually relevant movement experiences (Logan et al., 2018; Barnett et al., 2019).

The significant difference between groups in the posttest further confirms the superiority of the traditional Boy game intervention. This outcome reinforces the argument that culturally embedded physical activities can function as effective

pedagogical tools rather than merely recreational play (Setiawan, 2023; Wani, 2024). From a pedagogical standpoint, the Boy game embodies the principle of “learning by doing,” which aligns with constructivist and experiential learning theories. Gunawan (2020) and Kurnia and Widodo (2020) highlight that direct movement experience is essential in strengthening gross motor pathways and improving coordination efficiency.

Beyond locomotor performance, qualitative observations during the intervention revealed increased enthusiasm, cooperation, and sportsmanship among students in the experimental group. These findings resonate with Widya and Haryanto (2021), who argue that traditional games inherently integrate social values such as teamwork and responsibility. Similarly, Setiawan (2023) found that culturally grounded physical activities promote character development by fostering solidarity and respect among peers. This multidimensional benefit aligns with the holistic objectives of PJOK, which emphasize not only physical competence but also character and social development (Natal et al., 2026).

From a neurophysiological perspective, high-intensity intermittent play such as the Boy game enhances motor unit recruitment and coordination efficiency (Holfelder & Schott, 2019). The rapid acceleration and deceleration patterns required in the game stimulate proprioceptive and vestibular systems, which are critical for balance and spatial awareness in children (Hardy et al., 2022). This explains the marked improvement in agility and coordination components observed in the experimental group.

Furthermore, culturally responsive pedagogy literature supports integrating local wisdom into formal education to enhance relevance and engagement (Wani et al., 2024). By incorporating a familiar traditional game, the intervention likely reduced psychological barriers and increased participation willingness. Côté and Erickson (2019) emphasize that play-based learning rooted in cultural familiarity strengthens intrinsic engagement, thereby enhancing learning outcomes.

Another important implication of this study is its contextual relevance for schools with limited infrastructure. Traditional games require minimal equipment and space, making them accessible and cost-effective (Wani, 2025). This supports findings by Palmer et al. (2021) that low-resource interventions can still produce significant motor improvements when structured appropriately. Thus, the Boy game presents a sustainable instructional alternative for rural or semi-urban schools such as SDK Wolowio. The large effect size observed in the experimental group indicates not only statistical significance but also practical significance. According to Lakens (2017), effect size provides a clearer interpretation of intervention impact in educational research. The substantial difference demonstrates that integrating traditional games into PJOK curricula can produce meaningful improvements in locomotor competence.

Overall, the results of this study reinforce contemporary evidence that motor competence is highly responsive to structured, engaging, and contextually meaningful interventions (Robinson et al., 2020; Hardy et al., 2022). The Boy game successfully combined motor repetition, variability, cognitive engagement, and social interaction within a culturally authentic framework. In conclusion, the implementation of the traditional Boy game significantly enhances elementary students’ locomotor skills

compared to conventional physical education instruction. The intervention not only improves speed, agility, and coordination but also strengthens affective and social dimensions aligned with national educational goals. These findings contribute to the growing body of evidence supporting culturally grounded, game-based learning as an effective and sustainable strategy for optimizing fundamental motor development in elementary education contexts.

## CONCLUSION

The findings of this study confirm that the implementation of physical education learning based on the traditional Boy game significantly improves locomotor skills among elementary school students at SDK Wolowio. Empirical evidence shows that the experimental group's mean score increased from 58.40 (SD = 6.85) in the pretest to 78.32 (SD = 6.14) in the posttest, with a gain of 19.92 points ( $t = 12.846$ ;  $p < 0.05$ ). In contrast, the control group improved from 57.96 (SD = 6.72) to 63.88 (SD = 6.48), with a smaller gain of 5.92 points ( $t = 4.214$ ;  $p < 0.05$ ). Furthermore, the independent t-test on posttest scores revealed a significant difference between groups ( $p < 0.05$ ), indicating the superior effectiveness of the traditional game intervention.

Conceptually, these results support motor learning theory, which emphasizes that repeated, varied, and contextually meaningful movement experiences enhance speed, agility, and coordination the core components of locomotor skills. The Boy game provided multidirectional running, rapid directional changes, and dynamic coordination tasks, creating optimal movement stimuli. Beyond motor outcomes, the intervention also fostered enthusiasm, cooperation, and sportsmanship, reinforcing the holistic objectives of physical education. Thus, the traditional Boy game represents an effective, culturally relevant, and sustainable instructional strategy for improving elementary students' locomotor competence.

## ACKNOWLEDGEMENTS

The authors express their sincere appreciation to SDK Wolowio for granting research permission and facilitating the implementation of this experimental study. The institutional support provided by the school principal and Physical Education teachers was instrumental in ensuring that the intervention based on the traditional Boy game was conducted systematically and in accordance with the planned instructional design.

Special gratitude is extended to the students who participated actively throughout the pretest, intervention sessions, and posttest phases. Their enthusiasm, cooperation, and consistent engagement contributed significantly to the reliability of the locomotor performance data, particularly in the assessment of speed, agility, and coordination components. The successful implementation of the structured traditional game sessions would not have been possible without their commitment and active participation.

The authors also acknowledge academic mentors and colleagues for their constructive feedback, methodological insights, and statistical guidance, which strengthened the empirical rigor and conceptual clarity of this study.

Finally, appreciation is extended to all individuals and institutions who provided moral and academic support. It is hoped that this research contributes meaningfully to the advancement of culturally responsive physical education and the enhancement of elementary students' locomotor competence through traditional games.

## REFERENCES

- Aisyah, S., & Rahman, A. (2020). The effectiveness of traditional games in improving fundamental movement skills in elementary school students. *Jurnal Pendidikan Jasmani dan Olahraga*, 5(2), 112–120. <https://doi.org/10.17509/jpjo.v5i2.24567>
- Andriani, D., & Nugroho, S. (2021). Innovation in physical education learning and its impact on students' motor skills. *Jurnal Ilmu Keolahragaan*, 20(1), 45–53. <https://journal.unnes.ac.id>
- Barnett, L. M., Webster, E. K., Hulteen, R. M., De Meester, A., Valentini, N. C., Lenoir, M., Pesce, C., Getchell, N., Lopes, V. P., Robinson, L. E., Brian, A., & Rodrigues, L. P. (2019). Through the looking glass: A systematic review of longitudinal evidence, providing new insight for motor competence and health. *Sports Medicine*, 49(6), 875–920. <https://doi.org/10.1007/s40279-019-01088-3>
- Brian, A., Pennell, A., Taunton, S., Starrett, A., Howard-Shaughnessy, C., Goodway, J. D., & Stodden, D. (2020). Motor competence levels and developmental delay in early childhood: A multicenter cross-sectional study. *Journal of Motor Learning and Development*, 8(3), 1–17. <https://doi.org/10.1123/jmld.2019-0035>
- Côté, J., & Erickson, K. (2019). Youth sport development: Integrating play and structured practice. *Kinesiology Review*, 8(1), 54–62. <https://doi.org/10.1123/kr.2018-0065>
- Dewi, R., & Satria, M. (2021). Traditional game-based learning model to improve fundamental movement skills. *Jurnal SPORTIF*, 7(3), 210–221. [https://doi.org/10.29407/js\\_unpgri.v7i3.16045](https://doi.org/10.29407/js_unpgri.v7i3.16045)
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage Publications. <https://us.sagepub.com>
- Goodway, J. D., Ozmun, J. C., & Gallahue, D. L. (2019). *Understanding motor development* (8th ed.). Jones & Bartlett Learning. <https://www.jblearning.com>
- Gunawan, I. (2020). Experiential learning in physical education: Enhancing gross motor development. *Jurnal Pendidikan Olahraga*, 9(1), 23–34. <https://doi.org/10.31571/jpo.v9i1.1800>
- Hardy, L. L., King, L., Farrell, L., Macniven, R., & Howlett, S. (2022). Fundamental movement skills among Australian children: Associations with physical activity and weight status. *Journal of Science and Medicine in Sport*, 25(2), 120–126. <https://doi.org/10.1016/j.jsams.2021.09.001>
- Holfelder, B., & Schott, N. (2019). Relationship of fundamental movement skills and physical activity in children and adolescents: A systematic review. *Psychology of Sport and Exercise*, 43, 180–191. <https://doi.org/10.1016/j.psychsport.2019.01.005>

- Kurnia, F., & Widodo, A. (2020). Direct movement experience and motor development in elementary school students. *Jurnal Pendidikan Jasmani Indonesia*, 16(2), 95-104. <https://journal.uny.ac.id>
- Lakens, D. (2017). Calculating and reporting effect sizes to facilitate cumulative science. *Frontiers in Psychology*, 8, 863. <https://doi.org/10.3389/fpsyg.2017.00863>
- Logan, S. W., Robinson, L. E., Wilson, A. E., & Lucas, W. A. (2018). Getting the fundamentals of movement: A meta-analysis of the effectiveness of motor skill interventions in children. *Child: Care, Health and Development*, 44(6), 834-847. <https://doi.org/10.1111/cch.12638>
- Palmer, K. K., Stodden, D. F., & Ulrich, D. A. (2021). Longitudinal associations between motor competence and physical activity in childhood. *Medicine & Science in Sports & Exercise*, 53(2), 346-352. <https://doi.org/10.1249/MSS.0000000000002480>
- Robinson, L. E., Stodden, D. F., Barnett, L. M., Lopes, V. P., Logan, S. W., Rodrigues, L. P., & D'Hondt, E. (2020). Motor competence and its effect on positive developmental trajectories of health. *Sports Medicine*, 50(4), 1-20. <https://doi.org/10.1007/s40279-019-01264-5>
- Setiawan, R. (2023). Character education values in traditional Indonesian games. *Jurnal Pendidikan Karakter*, 13(1), 56-67. <https://doi.org/10.21831/jpk.v13i1.54012>
- Susanto, H. (2022). Sedentary behavior and motor skill development in elementary school students. *Jurnal Keolahragaan*, 10(2), 150-160. <https://doi.org/10.21831/jk.v10i2.45678>
- Widya, M., & Haryanto, E. (2021). Social values in traditional play activities among elementary students. *Jurnal Pendidikan dan Kebudayaan*, 26(3), 311-322. <https://doi.org/10.24832/jpnk.v26i3.2055>
- Wani, B. (2024). Integrating local wisdom into physical education curriculum. *Jurnal Pendidikan Kepeleatihan Olahraga*, 18(1), 1-12. <https://journal.unm.ac.id>
- Wani, B. (2025). Digital adaptation of traditional sports in physical education learning. *Competitor: Jurnal Pendidikan Kepeleatihan Olahraga*, 19(2), 85-96. <https://journal.unm.ac.id>
- Wani, B., et al. (2024). Traditional physical activities and character development in elementary education. *Jurnal Pendidikan Jasmani dan Olahraga*, 9(1), 15-27. <https://doi.org/10.17509/jpjo.v9i1.58765>
- Wick, K., Leeger-Aschmann, C. S., Monn, N. D., Radtke, T., Ott, L. V., Rebholz, C. E., Cruz, S., Gerber, N., Schmutz, E. A., & Puder, J. J. (2017). Interventions to promote fundamental movement skills in childcare and kindergarten: A systematic review and meta-analysis. *Sports Medicine*, 47(10), 2045-2068. <https://doi.org/10.1007/s40279-017-0723-1>