The Effectiveness of the SOS FIT Challenge Game in Improving Basic Motor Skills of Elementary School Students

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Article Info

Abstract

Physical education learning in elementary schools requires innovative approaches that encourage students to be physically active while maintaining meaningful learning experiences. Basic motor skills play a fundamental role in children's physical development; however, these skills often receive insufficient stimulation in conventional learning practices. Therefore, game-based learning models that integrate structured physical activities are needed. This study aimed to examine the effectiveness of the SOS Fit Challenge game in improving basic motor skills of elementary school students. The research focused on implementing a strategy-based game combined with physical challenges in physical education learning. A quantitative approach with a one-group pretest–posttest design was employed. The population consisted of all fourth- and fifth-grade students of Ngampal State Elementary School 1 Sumberejo in the 2025/2026 academic year. A total of 20 students were selected as the sample using total sampling techniques. The research instrument was a basic motor skills test administered before and after the intervention. Data were analyzed using descriptive statistics, the Shapiro–Wilk normality test, and a paired samples t-test with the assistance of IBM SPSS software. The results indicated a significant improvement in students' basic motor skills after the implementation of the SOS Fit Challenge, as evidenced by a statistically significant difference between pretest and posttest scores ($p < 0.001$). SOS Fit Challenge game is recommended as an effective game-based learning model for physical education in elementary schools.

INTRODUCTION

Game-based learning approaches are increasingly recognized as relevant learning strategies in elementary education due to their ability to create a more active, interactive, and student-centered learning process. Through play activities, students not only receive material passively but are directly involved in the learning process through interaction, exploration, and problem-solving (Aliriad, 2023). This approach aligns with the characteristics of elementary school students' development, who are still at the concrete operational stage and tend to learn more effectively through learning experiences that are tangible and enjoyable (Dewi, 2022; Ningsih, 2024).

Physical Education, Sports, and Health (PJOK), game-based learning plays an increasingly important role. PJOK learning is not only aimed at improving physical fitness but also aims to develop basic movement skills, cooperation, sportsmanship, as well as the formation of students' character (Aliriad et al., 2023). Several studies have shown that game-based PE learning innovations, particularly those utilizing traditional games, can improve student engagement and the quality of the learning process in elementary schools (Angreza & Purwanto, 2023). These findings are reinforced by the research of Prasetyo et al. (2025) serta Santos & Hudain, (2020) which concluded that game-based learning is effective in improving students' motor skills and physical fitness.

Various types of games have been developed and utilized as learning media, including traditional games, board games, and digital-based games (Kurniawati et al., 2021; Susanto & Usman, 2024). Traditional games have been proven to possess high educational value because they incorporate elements of physical activity, social interaction, and cultural values that are relevant to students' developmental stages (Angreza & Purwanto, 2023; Nurjannah et al., 2020). Modern educational games, such as Monopoly, Snakes and Ladders, as well as various board and digital games, have also been widely implemented to enhance students' motivation and learning outcomes in academic subjects, including science, social studies, mathematics, and language learning (Hermawati & Lestari, 2024; Hikmah et al., 2023; Pratiwi & Hardini, 2022).

Although these educational game media have been shown to effectively improve cognitive aspects and learning motivation, most existing studies remain focused on classroom-based learning with relatively limited levels of physical activity (Effendi & Cahyani, 2021). In the context of physical education and elementary school child development, basic motor skills such as running, jumping, coordination, and balance are fundamental abilities that serve as the primary foundation for physical development and the acquisition of sports skills at subsequent educational stages (Nurdiana, 2023; Santos & Hudain, 2020). Therefore, game-based learning models specifically designed to integrate strategic game elements with challenging and structured physical activities are needed.

Several studies have demonstrated that game-based learning models can improve students' motor skills and movement performance (Prasetyo et al., 2025; Siregar & Hardinoto, 2020). Games commonly used tend to be general in nature, such as traditional games or fun game–based exercises, without a strategy-based structure that systematically encourages cognitive engagement and decision-making in the context of physical education learning (Hermawati & Lestari, 2024). Educational board games, such as Monopoly and tic-tac-toe, are generally designed for classroom-based academic learning and have not been widely utilized as instructional media oriented toward the development of basic motor skills (Hikmah et al., 2023; Retno et al., 2024).

This condition indicates the existence of a research gap, namely the limited development and evaluation of strategy-based game models that integratively combine basic motor skill–based physical challenges within elementary school physical education learning. The integration of game strategies and physical activities has the potential to provide more comprehensive stimulation, not only in the physical domain but also in students' cognitive engagement and learning motivation.

In contrast to previous studies, this research offers novelty through the development of the SOS Fit Challenge game model, which adapts the principles of the tic-tac-toe board game and combines them with physical challenges based on basic motor skills. The novelty of this model lies in its game mechanism, which requires students to complete physical activities, such as FiveBallRun and Jumpify, as prerequisites for executing strategic moves on the game board. Through this mechanism, basic motor skills are not merely supporting activities but are positioned as a core component of the learning process.

Based on the identified rationale and research gap, this study aims to examine and analyze the effectiveness of the SOS Fit Challenge game model in significantly improving elementary school students' basic motor skills. The findings are expected to provide empirical contributions to the development of innovative, structured, and game-based physical education learning models through the integration of strategy-based game elements with systematic physical activities that align with the developmental characteristics and needs of elementary school students.

The research question is: *Does the implementation of the SOS Fit Challenge game significantly improve students' basic motor skills?* The hypotheses are formulated as follows: H_0: There is no significant difference between pretest and posttest scores of students' basic motor skills. H_1: There is a significant difference between pretest and posttest scores of students' basic motor skills after the implementation of the SOS Fit Challenge game.

METHODS

This study employed a quantitative approach using a one-group pretest–posttest design to examine changes in students' basic motor skills following the implementation of the SOS Fit Challenge

game model. The research participants consisted of all fourth- and fifth-grade students of Ngampal State Elementary School 1 Sumberejo in the 2025/2026 academic year, with a total sample of 20 students, comprising 10 male and 10 female students. All participants were selected using a total sampling technique and took part in the study in its entirety. Basic motor skills were assessed before and after the intervention using the same basic motor skills test instrument.

Research began with a planning stage, which included the development of observation instruments, the determination of basic motor skill indicators, and the scheduling of the pretest, intervention, and posttest sessions. At this stage, the SOS Fit Challenge game was also adjusted to align with students' abilities and the objectives of improving basic motor skills (Adji & Wibowo, 2023).

Intervention consisted of the SOS Fit Challenge game, a tic-tac-toe–based game modified into a physical obstacle activity. The game involved two main challenges: *FiveBallRun*, a task in which students ran back and forth while arranging balls five times to develop strength, agility, and coordination; and *Jumpify*, a jumping obstacle designed to enhance explosive power and balance. After completing both challenges, students were allowed to move one token according to their team color on the SOS game board, thereby integrating physical activity, strategy, and motivation.

After completing both obstacles, students are allowed to move one cone according to their team's color on the SOS game board, thereby integrating physical activity, strategy, and motivation within the game. The principles of motor learning emphasize that changes in motor performance occur as a result of practice and experience gained through repeated activities. In the early stages of learning, improvements in performance can be observed after learners are provided with sufficient opportunities for practice, even within a relatively limited period of time (Schmidt & Lee, 2018).

During the intervention, the researchers systematically observed students' participation, motor responses, and development of basic motor skills using validated observation instruments to ensure that the intervention was implemented as planned (Andriadi & Saputra, 2021). Upon completion of the intervention, a posttest was administered using the same instrument as the pretest. The results of the pretest and posttest were then compared to identify improvements in students' basic motor skills and to evaluate the effectiveness of the SOS Fit Challenge game within the one-group design (Sa'diyah et al., 2020; Sari & Marhaendra, 2021).

Data analysis was conducted in several stages. Descriptive statistics were first used to describe pretest and posttest data, including mean scores, minimum and maximum values, and standard deviations. The Shapiro–Wilk normality test was then applied to confirm data normality. After the normality assumption was met, a paired samples t-test was performed to compare pretest and posttest scores and determine the significance of differences before and after the intervention (Adnan & Latief,

2020; Arib et al., 2024). All statistical analyses were conducted using IBM SPSS software.

RESULT

Table 1. Descriptive Analysis

Test	N	Mean
Pre	20	10,20
Post	20	17,75

Table 1, shows that the total number of research participants was 20 students. The pretest results indicated a mean score of 10.20, while the posttest mean score increased to 17.75. This increase demonstrates an improvement in students' basic motor skills after the intervention, indicating that the applied treatment had a positive effect on learning outcomes.

Table 2. Normality Test of Pretest - Posttest

Var	Sig	Sig level	ket
Pre	0,500	0,05	Normal
Post	0,167	0,05	Normal

Table 2, shows that both pretest (Sig. = 0.500) and posttest (Sig. = 0.167) data were normally distributed, as the significance values exceeded 0.05. These results indicate that the data met the assumptions required for parametric statistical analysis. Therefore, further analysis using parametric tests, such as the t-test, was appropriate for comparing pretest and posttest scores in this study.

Table 3. Paired Samples t - Test

Comp	Mean Diffent	t	Sig (p)	Ket
Pre – Post	-7,55	-30,72	0,001	sig

Table 3, indicates a statistically significant difference between pretest and posttest scores of students' basic motor skills following the implementation of the SOS Fit Challenge game. The significance value of $p < 0.001$ confirms that the instructional game media were effective in improving elementary school students' basic motor skills.

Overall, the results of the Shapiro–Wilk normality test and the paired samples t-test demonstrate that the SOS Fit Challenge game effectively enhanced students' basic motor skill performance and may be considered for broader implementation in physical education learning contexts.

DISCUSSION

The results of this study indicate that the SOS Fit Challenge game model is effective in improving elementary school students' basic motor skills. The significant difference between pretest and posttest scores demonstrates that game-based physical education learning provides more optimal motor stimulation compared to conventional instructional approaches. Physical activities presented in the form of games are able to enhance movement quality, participation, and student engagement during physical education lessons (Mawarti et al., 2021; Sari & Marhaendra, 2021).

The effectiveness of the SOS Fit Challenge is closely related to its characteristics, which systematically integrate physical activities into the game

mechanism. Basic motor skills such as running, jumping, coordination, and balance are not delivered as isolated exercises but are embedded as essential components of the game flow (Aliriad et al., 2023). This learning pattern encourages students to engage in repeated physical movements within an enjoyable learning environment, thereby providing continuous motor stimulation. Similar approaches have been reported to effectively enhance children's motor skills through activity-based games (Kholifah et al., 2022; Mahfud & Fahrizqi, 2020).

In addition to physical engagement, the SOS Fit Challenge game also incorporates cognitive elements through decision-making and strategic play. This cognitive involvement enriches students' learning experiences, as they are required not only to perform movements but also to think, collaborate, and actively determine game strategies (Fajarwati & Arini, 2023). Such conditions contribute to a more meaningful learning process that is not limited to one-way instruction. Games that combine physical movement with strategic elements have been shown to improve learning quality in a more comprehensive manner (Annisa, 2024).

Game-based physical education learning also creates a learning atmosphere that is more engaging, challenging, and less monotonous. Students tend to show higher levels of enthusiasm when participating in learning activities that involve elements of play, challenge, and cooperation (Mawarti et al., 2021). This situation contributes to increased intensity and quality of students' physical activity

during lessons. These findings further support the view that game-based approaches in physical education are more effective in enhancing student engagement and learning experiences than traditional instructional methods (Sari & Marhaendra, 2021).

Overall, the findings of this study confirm that the SOS Fit Challenge game represents an effective, adaptive, and developmentally appropriate game-based physical education learning model for elementary school students. The integration of structured physical activities and game strategies enables this model not only to improve basic motor skills but also to foster active, enjoyable, and meaningful learning experiences. Therefore, the SOS Fit Challenge can be considered a viable alternative instructional model for elementary school physical education to promote more varied and engaging learning processes.

CONCLUSION

The findings of this study indicate that the implementation of the SOS Fit Challenge game has a positive impact on improving elementary school students' basic motor skills. The significant differences observed between pretest and posttest results demonstrate that this game-based learning model is capable of enhancing students' motor skill performance in a meaningful way.

SOS Fit Challenge provides a learning experience that integrates physical activities with strategic and challenging elements, encouraging students to engage in active movement within an enjoyable learning

environment. This condition increases students' involvement in physical education learning from both physical and cognitive perspectives and helps reduce boredom commonly associated with conventional instructional approaches.

SOS Fit Challenge game can be considered an innovative and developmentally appropriate alternative model for physical education learning in elementary schools. Nevertheless, this study is limited by its research design and sample size. Therefore, further studies employing more comprehensive experimental designs and larger samples are recommended to strengthen the findings and expand the application of this game-based learning model in elementary school settings.

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