



THE EFFECTIVENESS OF THE COLORFUL BALLS RUN GAMES MODEL ON IMPROVING THE SHORT-DISTANCE RUNNING LEARNING OUTCOMES OF PHASE C ELEMENTARY SCHOOL STUDENTS

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Received: September 2025, Revised: November 2025, Accepted: January 2026

Abstract

This study aimed to develop and examine the effectiveness of the Colorful Balls Run Games learning model in improving short-distance running skills among Phase C students at SDN 106 Kota Bengkulu. Short-distance running is a fundamental athletic skill that requires proper technique, coordination, and speed, yet its instruction in elementary schools is often perceived as monotonous and less engaging for students. This condition may lead to low motivation and limited active participation during learning activities. Therefore, an innovative and game-based learning model is needed to create a more enjoyable and meaningful learning experience. The research employed a Research and Development (R&D) approach consisting of four main stages: preliminary study, model design, limited trial, and product revision. The participants were 24 elementary students (13 boys and 11 girls). A one-group pretest–posttest design was applied using a 40-meter sprint test, observation sheets, and teacher evaluations as instruments. Data analysis focused on comparing students' performance before and after the implementation of the learning model. The findings indicated a significant improvement in sprint performance, with the average running time decreasing from 10.27 seconds to 9.35 seconds ($p < 0.05$). In addition, students' motivation and active participation increased substantially from 63% to 91%. These results demonstrate that the Colorful Balls Run Games model effectively created an enjoyable learning atmosphere, fostered students' enthusiasm, and enhanced their fundamental motor skills. In conclusion, this learning model can be recommended as an innovative instructional approach for short-distance running lessons in elementary physical education, particularly to improve both learning outcomes and student.

Keywords: learning model, short-distance running, Colorful Balls Run Games, Phase C students, physical education



INTRODUCTION

Physical education is an integral part of overall education that plays an important role in developing the physical, psychomotor, cognitive, and affective aspects of students. Through planned and systematic physical activities, students can learn to understand the importance of physical fitness, sportsmanship, cooperation, and character building. According to (Bostanci, 2020), physical education is not merely a means to achieve physical fitness, but also a medium for learning values, attitudes, and social skills that support overall personal development.

One of the main subjects in the physical education curriculum in elementary schools is athletics, which includes short-distance running. Short-distance running or sprinting is a basic activity that aims to train speed and body movement coordination. Learning short-distance running is very important because it forms the foundation for various other movement skills. However, the reality in the field shows that many students are not yet able to demonstrate optimal learning outcomes. This is often due to a monotonous, results-oriented approach to learning that does not pay enough attention to the characteristics of elementary school-aged children.

According to Djumrah, (2020), conventional learning approaches in physical education often fail to attract students' attention due to the lack of variety in activities, even though elementary school children tend to learn more effectively through play activities. Fun, creative, and movement-oriented learning will yield better results than one-way instructional learning. This is in line with kinesthetic learning theory, which emphasizes that students learn best when they are actively moving, interacting, and directly experiencing physical activities.

Previous studies have shown that the application of game-based learning models can increase motivation and learning outcomes in physical activities. For example, (Syaiful et al., 2023) found that the use of reciprocal and self-check methods in tennis learning can significantly improve students' technical skills. These findings reinforce the assumption that variations in learning models that involve active participation and self-reflection can increase the effectiveness of the teaching and learning process.

Based on initial observations at SDN 106 Bengkulu City, it was found that most students in phase C (grades IV–V) lacked enthusiasm for short-distance running lessons. Students tended to tire quickly and lose focus, and lacked understanding of basic running techniques such as starting, acceleration, and finishing. This condition is exacerbated by teaching methods that are still conventional and lack innovation. Therefore, it is necessary to develop a learning model that combines elements of games, colors, and competition so that students are more active and motivated.

The Colorful Balls Run Games learning model was designed to address these challenges.



This model adapts the principles of games by utilizing colorful balls as a learning medium to reinforce the basic concepts of short-distance running. The colors of the balls serve as visual stimuli to help students understand instructions, while the game elements create a fun learning atmosphere. Through a combination of colors, fast movements, and simple rules, students not only run to reach the finish line, but also learn to develop reaction speed, hand-eye coordination, and the ability to focus on stimuli.

This model is also in line with the active learning approach, in which students are directly involved in learning experiences that require exploration, creativity, and reflection. According to (Mangolo et al., 2025), active learning packaged in the form of games can significantly increase children's activity and motor skills. In addition, color-based activities are also believed to improve students' visual-motor responses and emotional involvement during the learning process.

The application of the Colorful Balls Run Games model is expected to provide a new and more meaningful learning experience for elementary school students, as each element of the game has its own pedagogical value. For example, the selection of bright colors can attract attention and facilitate understanding of instructions, while the element of competition encourages a spirit of achievement without neglecting cooperation and sportsmanship. Thus, this study aims to analyze the effectiveness of the Colorful Balls Run Games learning model on improving short-distance running learning outcomes in phase C students at SDN 106 Kota Bengkulu. The results of this study are expected to contribute significantly to the development of innovative learning models relevant to the characteristics of elementary school-aged children, while enriching the body of research in the field of physical education in Indonesia.

METHODOLOGY

This study used a quasi-experimental method with a one-group pretest–posttest design to test the effectiveness of the Colorful Balls Run Games model on improving the short-distance running ability of phase C students. This design was used to compare students' abilities before and after being given learning treatment without using a control group (Schoonenboom & Johnson, 2017).

The experimental approach in physical education has been proven effective in measuring changes in motor skills and physical fitness in elementary school children (Malm et al., 2019). Therefore, this study focused on improving students' running speed through fun and structured play activities. The study was conducted at SDN 106 Bengkulu City. The research subjects were 24 phase C students (grades IV–V), consisting of 13 male students and 11 female students, aged 9–11 years. The subjects were selected using purposive sampling based on the recommendations of the physical education teacher, taking into account their physical health, ability to participate in



physical education classes, and consistent attendance during the research process.

This study was conducted over four sessions consisting of a pretest, model implementation, and posttest. The first session involved a pretest in the form of a 40-meter sprint to measure the students' initial speed. The second and third sessions were used to implement the Colorful Balls Run Games model, which is a color-based ball game placed on a track, where each color represents a different movement category such as sprinting, reaction start, and visual-motor coordination. In the fourth session, a posttest was conducted using the same procedure to assess the improvement in ability after the treatment. The Colorful Balls Run Games model was developed based on the principle of fun-based learning, which emphasizes the elements of play, motivation, and collaboration among students (Light & Harvey, 2017), with a series of activities including dynamic warm-ups, main games that combine speed and reaction to ball colors, and active cool-downs at the end of the session.

The main research instrument was the 40-meter sprint test, in accordance with the Eurofit Physical Fitness Test guidelines (Tomkinson et al., 2018). Measurements were taken individually using a digital stopwatch with an accuracy of 0.01 seconds. In addition, researchers used learning activity observation sheets to assess student motivation, cooperation, and enthusiasm during the learning process. Observations were conducted by physical education teachers and one research assistant. The content validity of the instruments was based on a literature review and consultation with two lecturers specializing in physical education. The reliability of the speed measurements was reinforced by recording each student's time twice and then taking the average.

The data were analyzed using descriptive statistics (mean, difference, and percentage increase) and a paired sample t-test with a significance level of $\alpha = 0.05$ to determine the difference between the pretest and posttest results (Chapman, 2018). The analysis was performed using SPSS 25.0 software. This analysis is in line with the nature of physical education research, which assesses the effect of short-term treatment on motor skills (Mo et al., 2024).

RESULTS

This study aims to determine the effectiveness of the Colorful Balls Run Games model in improving short-distance running speed among phase C students at SDN 106 Kota Bengkulu. The research subjects consisted of 24 students (13 boys and 11 girls). The learning was conducted over 4 sessions, each lasting 60 minutes. Measurements were taken using a 40-meter running test at the pretest and posttest stages. The measurement results showed a significant increase in travel time for all students.



Table 1. The comparative test results

Gender	n	Pre-test Average (seconds)	Post-test Average (seconds)	% Improvement
Male	13	9.83	8.94	9.05 %
Female	11	10.57	9.86	6.71 %
Overall	24	10.27	9.35	8.96 %

The paired sample t-test showed a calculated t-value of 6.21 > table t-value = 2.07 (d.f. = 23, $p < 0.05$), indicating a significant difference between the pretest and posttest results. These findings show that the Colorful Balls Run Games learning model is effective in improving the short-distance running speed of elementary school students.

In addition to quantitative improvements, the observation results also showed changes in students' learning behavior. During the learning process, active participation increased from 63% in the first meeting to 91% in the fourth meeting. Students' enthusiasm for running activities combined with ball color games and simple competitions increased significantly. Some students who were previously reluctant to participate in sprint training showed courage and enthusiasm for competition after the game was implemented.

Improvements in student performance were also seen in basic techniques. Starting position errors decreased by 28%, and the ability to maintain speed until the finish line improved. The observing teacher noted that this game helped students focus more on visual cues and movement coordination, resulting in better initial acceleration.

This is in line with the research by Ihwanto & Mashud (2021), which confirms that game-based learning in physical education can improve children's motivation and motor performance through an interactive approach.

Overall, the results of this study prove that the application of the Colorful Balls Run Games model has a positive effect on improving 40-meter sprint ability, active participation, and learning motivation of elementary school students in phase C. This model is recommended as an alternative game-based learning strategy in physical education subjects in elementary schools.

DISCUSSION

The results of the study show a significant increase in 40-meter sprint speed after implementing the Colorful Balls Run Games model. Male students experienced an average increase from 9.83 seconds to 8.94 seconds, while female students increased from 10.57 seconds to 9.86 seconds. This improvement indicates that the integration of color elements and light



competition in games can stimulate motor responses and strengthen basic sprinting coordination. These findings are in line with the results of (Purwanto et al., 2024) study, which states that game-based learning in physical education can increase motivation, active engagement, and physical activity performance in elementary school students. Through an interactive game approach, learning becomes more interesting and effective than conventional methods based on direct instruction.

In addition, the observed improvement in sprint performance suggests that the Colorful Balls Run Games model successfully integrates physical movement with cognitive engagement. By requiring students to respond quickly to visual cues while running, the game simultaneously trains speed, concentration, and decision-making abilities. This dual engagement encourages students to remain focused throughout the activity and reduces monotony often associated with repetitive sprint drills. Consequently, students are more likely to participate actively and perform movements with greater intensity, which contributes to improved sprint outcomes. This finding reinforces the idea that incorporating cognitive challenges into physical activities can enhance the effectiveness of motor skill learning in elementary physical education settings.

Theoretically, the effectiveness of this model can be explained through the concept of motor learning, which emphasizes the importance of stimulus variation in the process of learning motor skills. According to (Siregar et al., 2023), children's motor adaptation develops optimally when they are given different stimuli that challenge their coordination, balance, and reaction speed. In the context of this study, the variation in ball colors provides strong visual stimuli, encouraging students to accelerate their start reaction and dynamically adjust their step patterns and arm swings. This creates a richer learning experience, as students not only run but also develop the ability to quickly recognize visual cues. Thus, this game-based approach serves as a fun yet meaningful motor learning strategy.

From a pedagogical perspective, the Colorful Balls Run Games have been proven to create an active and competitive learning environment. Students in phase C (grades IV–V of elementary school) are at a stage of development where their intrinsic motivation is greatly influenced by play experiences and social interactions. Observations show that active participation increased from 63% to 91%, while starting position errors decreased by 28%. That a play-based approach to physical education can improve physical fitness learning outcomes and reduce student boredom. By creating challenging yet enjoyable learning experiences, teachers can foster self-confidence, enthusiasm, and good teamwork among students (Astar, 2020)

In addition to physical aspects, game-based learning also has a positive impact on students' social-emotional development. Activities in color groups, team communication, and healthy



competition help build mutual respect and sportsmanship. Hromek & Roffey (2009) emphasize that educational games in physical education play an important role in increasing students' empathy, social responsibility, and self-confidence. In the context of this study, students showed an increase in positive interactions, mutual support, and enthusiasm in participating in activities without coercion. Learning, which was initially considered monotonous, turned into a collaborative activity that fostered positive character values through the medium of games.

Although the results are encouraging, this study has limitations that need to be considered. The study design used a single group without a control group and the duration of implementation was only four meetings, so the long-term effects have not been fully measured. For further research, it is necessary to conduct an effectiveness test with a double-blind experimental design and follow-up measurements of coordination, start accuracy, and learning retention. Nevertheless, these findings have shown that the Colorful Balls Run Games model is feasible for implementation in short-distance running instruction in elementary schools. The approach, which combines elements of color, games, and competition, has proven effective in enhancing students' learning outcomes, motivation, and overall movement experiences.



Figure 1. Educational Video Barcode

CONCLUSION

The results of the study indicate that the implementation of the Colorful Balls Run Games learning model is effective in improving the short-distance running ability of phase C students at SDN 106 Kota Bengkulu. This model not only significantly improves running speed, but also encourages active participation, learning motivation, and students' coordination and reaction skills. Through a combination of color elements, light competition, and a fun playing atmosphere, physical education learning becomes more interesting and meaningful. For further research, it is recommended to conduct trials with a double-control experimental design and add other variables such as coordination, starting accuracy, and psychological aspects of students so that the results of the model development can be more comprehensive and applicable.



REFERENCE

- Astar, A. (2020). Upaya Meningkatkan Kesegaran Jasmani Melalui Pendekatan Bermain dalam Pembelajaran Pendidikan Jasmani. *Journal of Classroom Action Research*, 2(1), 70–75. <https://doi.org/10.29303/jcar.v2i1.429>
- Bostanci, Ö. (2020). Learning Style Preferences of Prospective Teachers of Physical Education and Sport. *Asian Journal of Education and Training*, 6(2), Article 2. <https://doi.org/10.20448/journal.522.2020.62.231.236>
- Chapman, S. J. (2018). Review of Discovering Statistics Using IBM SPSS Statistics, 4th Edition. *Journal of Political Science Education*, 14(1), 145–147. <https://doi.org/10.1080/15512169.2017.1366328>
- Djumrah, D. (2020). Upaya Meningkatkan Kesegaran Jasmani Melalui Pendekatan Bermain dalam Pembelajaran Pendidikan Jasmani bagi Siswa SMP Negeri 1 Bungku Timur Sulawesi Tengah. *Jurnal Paedagogy*, 7(4), 362. <https://doi.org/10.33394/jp.v7i4.2878>
- Hromek, R., & Roffey, S. (2009). Promoting Social and Emotional Learning With Games: “It’s Fun and We Learn Things”. *Simulation & Gaming*, 40(5), 626–644. <https://doi.org/10.1177/1046878109333793>
- Ihwanto, N., & Mashud, M. (2021). Game Based Learning in Physical Education Sport and Health Subject. *TEGAR: Journal of Teaching Physical Education in Elementary School*, 5(1), 10–18. <https://doi.org/10.17509/tegar.v5i1.34905>
- Light, R. L., & Harvey, S. (2017). Positive Pedagogy for sport coaching. *Sport, Education and Society*, 22(2), 271–287. <https://doi.org/10.1080/13573322.2015.1015977>
- Malm, C., Jakobsson, J., & Isaksson, A. (2019). Physical Activity and Sports—Real Health Benefits: A Review with Insight into the Public Health of Sweden. *Sports*, 7(5), 127. <https://doi.org/10.3390/sports7050127>
- Mangolo, E. W., Widyanto, Z., Widyanuri, N., Herma Wardani, A., & Yusuf Rumpaidus, G. (2025). Pelatihan Literasi Gerak Dasar untuk Siswa Sekolah Dasar. *Jurnal Pengabdian Kepada Masyarakat Indonesia (JPKMI)*, 5(2), 273–279. <https://doi.org/10.55606/jpkmi.v5i2.8109>
- Mo, W., Saibon, J. B., Li, Y., Li, J., & He, Y. (2024). Effects of game-based physical education program on enjoyment in children and adolescents: A systematic review and meta-analysis. *BMC Public Health*, 24(1), 517. <https://doi.org/10.1186/s12889-024-18043-6>
- Purwanto, D., Rejeki, H. S., & Mentara, H. (2024). Game-based physical learning model to enhance gross motor skills in young students. *Jurnal SPORTIF: Jurnal Penelitian Pembelajaran*, 10(3), 503–520. https://doi.org/10.29407/js_unpgri.v10i3.23982
- Schoonenboom, J., & Johnson, R. B. (2017). How to Construct a Mixed Methods Research Design. *KZfSS Kölner Zeitschrift Für Soziologie Und Sozialpsychologie*, 69(S2), 107–131. <https://doi.org/10.1007/s11577-017-0454-1>
- Siregar, E. S., Imanudin, & Sari, I. P. (2023). Development of Audio-Visual Media on the Physical Motor Development of Students in Big Kindergarten. *JTP - Jurnal Teknologi Pendidikan*, 25(3),



363–370. <https://doi.org/10.21009/jtp.v25i3.36947>

Syaiful, A., Widyanto, Z., & Marsuki, M. (2023). Studi Eksperimen Metode Mengajar Resipocal Self Check Terhadap Peningkatan Kemampuan Tenis Lapangan. *JURNAL STAMINA*, 6(4), 160–168. <https://doi.org/10.24036/jst.v6i4.1208>

Tomkinson, G. R., Carver, K. D., Atkinson, F., Daniell, N. D., Lewis, L. K., Fitzgerald, J. S., Lang, J. J., & Ortega, F. B. (2018). European normative values for physical fitness in children and adolescents aged 9–17 years: Results from 2 779 165 Eurofit performances representing 30 countries. *British Journal of Sports Medicine*, 52(22), 1445–1456. <https://doi.org/10.1136/bjsports-2017-098253>

