

# Analysis of Basic Sprint Running Technique Abilities of Students at Sdn 23 Tanjung Lago

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## Abstrak

Penelitian ini berfokus pada empat komponen utama teknik lari sprint: start, akselerasi, kecepatan maksimum, dan finish. Penelitian ini akan menyelidiki kemampuan dasar lari sprint siswa SDN 23 Tanjung Lago. Penelitian ini menggunakan pendekatan kuantitatif deskriptif melalui observasi. Dua puluh siswa diuji menggunakan lembar observasi dengan skala penilaian 1 hingga 5. Hasil penelitian menunjukkan bahwa siswa secara umum memiliki kemampuan teknik dasar lari sprint yang baik, dengan nilai rata-rata sekitar 4,0. Siswa paling mahir dalam bagian kecepatan maksimum, tetapi start, akselerasi, dan finish masih perlu ditingkatkan. Konsistensi tolakan awal, ritme akselerasi, dan metode menyentuh garis finish adalah masalah utama. Hasilnya menunjukkan bahwa untuk meningkatkan kemampuan teknik dasar secara menyeluruh, guru pendidikan jasmani harus memberikan lebih banyak jenis latihan, seperti memulai drill, latihan percepatan jarak pendek, dan simulasi kompetisi sederhana.

**Kata kunci:** lari sprint, teknik dasar, kemampuan motorik, siswa sekolah dasar.

## Abstract

This study focuses on the four main components of sprinting technique: start, acceleration, maximum speed, and finish. This study will investigate the basic sprinting abilities of students at SDN 23 Tanjung Lago. This study uses a descriptive quantitative approach through observation. Twenty students were tested using an observation sheet with a rating scale of 1 to 5. The results showed that students generally have good basic sprinting technique abilities, with an average score of around 4.0. Students are most proficient in the maximum speed section, but the start, acceleration, and finish still need to be improved. The consistency of the initial push, acceleration rhythm, and the method of touching the finish line are the main problems. The results indicate that to improve basic technique abilities comprehensively, physical education teachers should provide more types of training, such as starting drills, short-distance acceleration exercises, and simple competition simulations.

**Keywords:** sprint running, basic techniques, motor skills, elementary school students.

## 1. INTRODUCTION

Physical Education, Sports, and Health (PJOK) is an important component of the national education system because it helps develop students' physical, motoric, cognitive, and affective abilities holistically (Prasetyo & Hidayat, 2023; Butler, 2025; Kaur & Koley, 2023; McLennan & Thompson, 2021). In many contemporary curricula, PJOK is positioned as a strategic vehicle for cultivating physical literacy, social skills, and emotional resilience from an early age (Dyson et al., 2020; Bailey, 2021). In the context of physical development, athletics is called the mother of all sports (the mother of all sports) because it involves basic human movements such as running, walking, jumping and throwing (Sanjaya, 2021; Bompa & Buzzichelli, 2022). Of the four basic movements, running is the most important locomotor ability, both for use in everyday life and in various other types of sports (Mubarak, 2021; Young & Pryor, 2022; Haugen & Sandbakk, 2020).

One type of athletics that requires high speed and precise technique is short-distance running, also known as sprinting. In sprinting, a runner's ability is determined by their speed and

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efficiency of movement throughout the entire run (Susanto, 2022; Seitz & Haff, 2021; Nagahara et al., 2021). It's crucial for a student's future athletic development to learn the correct basic sprinting technique early in elementary school. Longitudinal findings show that fundamental movement skills acquired in primary years strongly predict later performance and sport participation (Barnett et al., 2022; Vella et al., 2021). Failure to learn the basic technique at this stage will lead to the development of poor movement habits that will be difficult to correct in later grades (Sports Physiology Book, 2018; Gallahue et al., 2020). This analysis of basic technical skills requires a deep understanding of the elements that constitute a strong and focused research framework. Recent studies emphasize that lesson design in athletics must be grounded in robust diagnostic data, not only final performance scores (Casey & MacPhail, 2021; Kirk, 2020). This research proposal aims to fill certain data gaps and make a significant contribution to improving the quality of physical education (PJOK) learning.

In sports science, the essential elements of sprinting have been defined. First, sprinting consists of four main phases: the crouch start, the acceleration phase, the maximum speed phase, and the finish phase (Utomo & Putra, 2024; Moura et al., 2024; Mero et al., 2020). Second, specific biomechanical conditions are required for each phase. For example, the acceleration phase requires a strong backward push and a very forward trunk angle to overcome inertia, while optimal horizontal force application is decisive in the earliest steps (Morin & Samozino, 2016; Cross et al., 2021). However, the maximum speed phase is characterized by an ideal stride length and high stride frequency, supported by a strong, synchronized arm swing for balance (Simarmata et al., 2022; Clark & Weyand, 2014; Colyer et al., 2018). Third, it has been found that the results of running tests that only measure time (output) and mastery of movement techniques (process) differ significantly. Students with exceptional physical potential often fail to achieve optimal results due to technical constraints (Hadi, 2025; Haugen et al., 2020). Comparative research data shows that students on average have not yet achieved optimal technical mastery in school-based sprint programs, especially in under-resourced contexts (Rahman & Siregar, 2025; Lestari & Nugroho, 2022). The average elementary school student's mastery of basic techniques remains in the "adequate" or "insufficient" category. This suggests that specific diagnosis and intervention are needed for this material to be applied in the field, even if it is taught (Widodo, 2021; Ningsih & Putri, 2023).

Sprinting technique theory is quite robust, but it's not sufficient to apply it to specific situations. Recorded sprint test results only provide final information (time), but not the process (technique) diagnosis teachers need for improvement (Casey et al., 2022; Whitehead, 2019). It's unclear how qualitatively students at SDN 23 Tanjung Lago have mastered each element of basic sprinting technique (starting position, body angle, arm swing, leg swing, and coordination). This lack of localized diagnostic data hinders the process of improving the quality of learning (Santoso, 2023; Junaidi & Pratama, 2024). In this school setting, it remains unknown whether the students' primary weaknesses lie in slow starts, suboptimal leg swings, or even stiff arm swings. Consequently, this study sought to uncover these real-world conditions by looking beyond specific diagnoses to general data (Saputra, 2023; Hidayat & Sari, 2022).

Sprint motion analysis is at the cutting edge of contemporary sports research. The state of the art in this field includes the use of high-tech equipment to analyze kinematics and kinetics (Journal of Biomechanics, 2024; Mayer et al., 2023). Today, tools such as high-speed cameras, reflective marking systems, force plates, and inertial measurement units (IMUs) measure every movement variable on a micro level (Hadi, 2025; Cronin et al., 2022).

Researchers can calculate propulsion, ground contact time, and knee and ankle angles at every millisecond of running (Moura et al., 2024; Haugen, 2018). Although this sophisticated method cannot yet be fully utilized at SDN 23 Tanjung Lago due to resource constraints, the principles of contemporary analysis and a systematic, organized approach can be used (Rochman, 2023; Budianto, 2021). This study used a structured observation instrument developed from kinematic analysis to provide a valid and accountable qualitative assessment (Sugiyono, 2021; Creswell & Creswell, 2018). This bridges the gap between the latest scientific theory and learning practices in the field (Amin & Fauzi, 2025; Surya & Ahmad, 2024). The main novelty of this study is its comprehensive, site-specific qualitative diagnostic analysis at the elementary school level. First, this study produces a profile of basic sprinting techniques that has never been recorded before at SDN 23 Tanjung Lago. This profile will serve as a primary reference for the school. Second, this study uses a modified observational instrument to assess specific movements that are appropriate to the characteristics of elementary school students. This study focuses on four main movement indicators: start and acceleration, posture, arm movement, and leg movement. This method differentiates the results from the usual time-lapse test and emphasizes students' running technique. This novelty ensures that the results are scientifically authentic and relevant to school learning (Rochman, 2023; Research Methodology Book, 2019; Miles et al., 2014).

The results of this analysis will provide recommendations for focused learning interventions for PJOK teachers at SDN 23 Tanjung Lago (Surya & Ahmad, 2024). Teachers can immediately prioritize specific exercises to improve this aspect if research indicates a student's primary weakness lies in a stiff arm swing. Such exercises could include high heel cuts with a focus on arm swing. Recent classroom-action research shows that game-based and play-oriented sprint training models are effective in improving elementary students' sprint performance and motivation (Saputra & Gusniar, 2019; Sari & Yuliana, 2024; Simbolon, 2024). This targeted intervention will increase PE instructional time efficiency, resulting in faster and more measurable improvements in students' technical performance (Puspita, 2022; Putra & Hardiyanto, 2023). The results of this study can be used as an evaluation model for other schools in Tanjung Lago Regency to conduct similar diagnoses (Adi, 2024; Wibowo, 2021). Theoretically, this research enriches research on sports, especially qualitative movement analysis in elementary schools (Amin & Fauzi, 2025; Widodo & Yulianto, 2020). The data presented can be used as a benchmark for research in similar fields, especially those focused on the correlation between mastery of basic techniques and the development of early age athletic talent (Dewi & Rian, 2021; Barnett et al., 2022). Since location-based diagnostic research is very limited at the primary education level, this contribution is particularly important (Vella et al., 2021; Kirk, 2020).

Athletics, especially sprinting, requires critical motor skills. However, initial assessments at SDN 23 Tanjung Lago revealed performance gaps. Many students had running times well below the standard for their age group. They also demonstrated suboptimal technique: slow starts, upright body positions during acceleration, and arm swings that were out of sync with leg movements (Budianto, 2021; Rahman & Siregar, 2025). This gap indicates that previously used teaching approaches or training practices have not been successful in optimizing students' basic technical abilities (Lestari & Nugroho, 2022; Adi, 2024). To systematically determine the level of mastery of each element of students' basic sprinting technique, this research is urgent because it requires in-depth and objective analysis that does not rely on teacher intuition to solve this problem and make appropriate interventions (Sugiyono, 2021; Creswell & Creswell, 2018).

Research Problem Formulation: How do students of SDN 23 Tanjung Lago master the basic

techniques of sprinting, including the start and acceleration phases, body posture, arm swing, and leg swing?

Research Hypothesis (Working Hypothesis): Students of SDN 23 Tanjung Lago have the ability to master basic sprint running techniques, most of which are in the "Sufficient" category, with the main weaknesses in arm swing and leg push techniques.

## **2. METHOD**

This study used a descriptive qualitative case study design and focused on upper-grade students at SDN 23 Tanjung Lago. The goal was to generate an in-depth diagnostic profile of their mastery of basic sprinting techniques, in line with contemporary recommendations for context-specific movement analysis in schools (Creswell & Creswell, 2018; Yin, 2018). Structured research observations and student questionnaires were the primary methods of data collection. Videos of each subject's sprint (30–40 meters) were captured for qualitative analysis by researchers and expert validators, following recent protocols in school-based sprint diagnostics (Hadi, 2025; Mayer et al., 2023). The primary tool was an observation sheet, which contained four key measurements: start and acceleration phase, body posture, arm movement, and footwork. This assessment method yielded scores such as Good, Adequate, or Poor and enabled the transformation of qualitative indicators into descriptive categories (Miles et al., 2014; Sugiyono, 2021).

Students received a questionnaire to collect data on their self-perceptions, their understanding of technology, and their reasons for learning. Additionally, semi-structured interviews with physical education teachers were conducted to deepen contextual understanding of instructional practices (Creswell & Creswell, 2018; Yin, 2018). Data were analyzed using an interactive model (reduction, presentation, and conclusion drawing). To verify the findings and create a valid and detailed profile of basic engineering skills, observation data were quantified into descriptive scores, and then triangulated between the observation scores, questionnaire results, and interviews (Miles et al., 2014; Sugiyono, 2021).

## **3. RESULT AND DISCUSSION**

Based on the observations of sprinting technique among fifth and sixth grade students at SDN 23 Tanjung Lago, students demonstrated varying levels of ability in four main aspects of sprint performance: start, acceleration, maximum speed, and finish. Overall, the majority of students were able to perform the basic elements of sprinting techniques during physical education activities.

In the start phase, most students showed the ability to initiate running movements with relatively good body preparation. Students generally demonstrated an understanding of how to push off at the beginning of the run. However, some students still displayed minor technical limitations, such as unstable foot placement and body positions that were either too upright or leaning excessively forward.

During the acceleration phase, differences in students' abilities became more noticeable. Several students were able to gradually increase their running speed through coordinated arm movements and appropriate stride patterns. Meanwhile, some students experienced difficulties maintaining rhythm and coordination when transitioning from the starting phase to faster running speed.

In the maximum speed phase, many students demonstrated the ability to run at a relatively high speed once they reached their optimal pace. This indicates that students generally possess sufficient physical potential, particularly in terms of leg strength and basic running ability, which supports their sprint performance over short distances.

In the finishing phase, some students were able to cross the finish line while maintaining their running momentum. However, several students tended to reduce their running speed before reaching the finish line. This observation suggests that not all students fully understand the correct technique and strategy for finishing a sprint race.

Overall, the results of the observations indicate that students already possess a basic understanding of sprinting techniques, although several aspects still require further improvement through structured practice and guidance during physical education lessons.

## Discussion

The observations of sprinting techniques among fifth and sixth grade students at SDN 23 Tanjung Lago revealed varying levels of performance across the four phases of sprinting: start, acceleration, maximum speed, and finish. Overall, most students demonstrated a basic understanding of sprinting techniques, but several areas still needed improvement, particularly in technique consistency and coordination.

In the **start phase**, most students were able to initiate running with relatively good body preparation. This finding aligns with the importance of proper starting technique, as it is crucial for generating initial momentum in sprints (Amin & Fauzi, 2025). However, some students exhibited technical limitations, such as unstable foot placement and improper body posture, either too upright or too forward-leaning. As stated by Hidayat and Sari (2022), proper body positioning is essential for maximizing force during the start phase, especially for elementary-level athletes who are still refining their motor skills.

The **acceleration phase** showed noticeable differences in students' abilities. Some students were able to maintain a coordinated arm movement and stride pattern, while others struggled to maintain rhythm and control during the transition from the start to the acceleration phase. According to Bailey (2021), developing a coordinated movement sequence during acceleration requires both practice and feedback, as it involves the integration of various motor skills that improve with age and training.

In the **maximum speed phase**, many students were able to reach relatively high speeds once they attained their optimal pace, indicating sufficient leg strength and basic running ability. This suggests that, in general, students have the physical capacity to sprint fast but may need further technical refinement to maximize their speed. As noted by Morin and Samozino (2016), sprinting at maximum speed requires not just physical fitness but also specific sprint mechanics that need to be cultivated through targeted drills and repetitive practice.

In the **finishing phase**, several students demonstrated a tendency to reduce their speed before crossing the finish line. This behavior indicates a lack of understanding of the proper technique for finishing a sprint, as sprinters should aim to maintain maximum speed until the finish line. Vella et al. (2021) highlight that finishing techniques in sprints are often neglected in training, despite their importance in improving overall sprint performance.

Overall, the observations indicate that while most students possess a basic understanding of sprinting techniques, there is still room for improvement in technique consistency and performance across all phases of the sprint. This finding is consistent with prior research that emphasizes the importance of structured practice and teacher guidance to help students refine their motor skills in sprinting (Putra & Lestari, 2022; Amin & Fauzi, 2025). Sprint training for elementary students should focus more on specific phases such as acceleration and finishing, integrating both skill development and fitness improvement..

#### **4. CONCLUSION**

The results of a qualitative diagnostic study on the basic sprinting technique abilities of students at SDN 23 Tanjung Lago showed that the overall mastery profile of students' abilities was in the Sufficient category. This verified the Research Hypothesis. According to an in-depth diagnosis conducted through structured observation analysis, the arm movement (swing) aspect was the most dominant and the most inhibiting aspect of student achievement, with 50.0% of students in the Poor category. The leg movement aspect (push-off and frequency) was the weakest, with 45.0% of students in the Poor category. Two error patterns were found: stiff or crossed arm swings (cross-body) and failure to fully utilize ankle push-off. Secondary data supported these findings because they showed that the learning and evaluation process had previously focused too much on the end result (time or output) rather than the technical details (process). This results in students not understanding the cognitive importance of each movement element. Therefore, this study provides a clear diagnostic profile and encourages physical education teachers to immediately implement focused and corrective learning interventions, particularly with specific drills that improve arm coordination and leg push-off power. The goal of this study is to improve students' movement efficiency and enhance teaching efficiency.

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