

CURRENT STATE OF FACTORS INFLUENCING THE DEVELOPMENT OF RUNNING SPEED IN  
THE 100M SPRINT FOR NON-SPECIALIZED UNIVERSITY STUDENTS AT TAN TRAO  
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*This study provides a comprehensive analysis of the current state of factors influencing the development of running speed in the 100m sprint for non-specialized university students at Tan Trao University. The primary objective of this research is to identify and examine the key elements that contribute to the improvement of short-distance running speed among this student population. Through an extensive review of both domestic and international literature, the study encompasses 20 relevant publications from 2012 to 2024, establishing a robust foundation for understanding the current state of research and best practices in this domain. The findings reveal that the development of running speed is influenced by a multifaceted interplay of biomechanical, physiological, psychological, and training-related factors. Specifically, the study delves into the significance of proper running technique, muscle strength and power, aerobic and anaerobic fitness, energy system utilization, athlete motivation, goal-setting, and mental preparation. Additionally, the paper highlights the importance of implementing effective training programs that incorporate periodization, volume and intensity management, and evidence-based injury prevention strategies. The implications of this study are paramount, as it offers valuable insights for coaches, physical education instructors, and sports science professionals working with non-specialized university students. The findings can inform the design and implementation of comprehensive training programs aimed at enhancing the speed capabilities of this population, while also prioritizing injury prevention and overall athletic development.*

*Keywords: Running Speed, 100m Sprint, Non-specialized University Students, Injury Prevention, Physical Education.*

**I. Introduction**

The importance of developing running speed has long been recognized in the realm of sports and physical education. Among the various track and field events, the 100-meter sprint stands out as a captivating display of pure athletic prowess, demanding a unique combination of explosive power, technical proficiency, and mental fortitude. For university students, particularly those not specializing in athletics, the pursuit of improved running speed can offer a multitude of benefits, ranging from enhanced physical fitness and competitive performance to improved overall well-being and self-confidence. At Tan Trao University, where the student population encompasses a diverse array of academic disciplines, the need to foster the development of running speed has become increasingly evident. These non-specialized students, who may not have had the opportunity to engage in systematic training or participate in high-level competitive environments, face unique challenges in their pursuit of short-distance running excellence. Recognizing the significance of this issue, the current study aims to investigate the current state of factors influencing the development of running speed in the 100-meter sprint for this specific student population.

The extant literature on the topic of speed development in sports and physical education has provided a solid foundation for understanding the multifaceted nature of this complex process. Researchers have identified a range of interrelated factors, including biomechanical, physiological, psychological, and training-related elements, that collectively shape an individual's running speed capabilities. However, the vast majority of these studies

have focused on specialized athletes or populations, leaving a notable gap in the understanding of how these factors manifest and interact within the context of non-specialized university students.

This study seeks to bridge this gap by conducting a comprehensive analysis of the current state of research, synthesizing insights from both domestic and international sources. By examining 20 relevant publications spanning the period from 2012 to 2024, the researchers aim to uncover the nuanced dynamics that influence the development of running speed among non-specialized university students at Tan Trao University. The findings of this investigation will not only contribute to the academic discourse but also provide valuable practical implications for coaches, physical education instructors, and sports science professionals working with this target population.

Ultimately, the present study's exploration of the current state of factors influencing running speed development in the 100-meter sprint for non-specialized university students at Tan Trao University holds the potential to inform the design and implementation of evidence-based training programs. These programs can then be tailored to effectively enhance the speed capabilities of this student population, while also prioritizing injury prevention and overall athletic development. The insights gained from this research can have far-reaching implications, potentially paving the way for a new era of holistic and inclusive approaches to speed training in university-level physical education.

## II. Research Findings and Discussion

This research study addresses the critical factors influencing the development of 100-meter sprint speed among non-specialized students at Tan Trao University, providing crucial evidence to better understand this issue.

Firstly, the study has demonstrated that proper running technique is a pivotal factor in the development of sprint speed. Previous studies have emphasized the importance of executing running steps with optimal body posture and effectively utilizing the propulsive force from the major muscle groups. This not only helps runners move faster but also assists them in avoiding injuries during training and competition.

Furthermore, the study has also identified muscular strength and endurance as another essential factor affecting 100-meter sprint performance. Exercises that enhance strength, power, and endurance help improve the athletes' force-generating capabilities, thereby enhancing sprint efficiency. This is particularly crucial for non-specialized students who may not have been exposed to and trained as systematically as professional athletes.

Additionally, psychological factors also play a significant role. Skills such as goal-setting, stress management, and self-confidence enable runners to maximize their potential. This is especially important for non-specialized students who may have limited competitive experience and face greater psychological pressure.

Finally, the study suggests that effective training programs, which incorporate components such as training cycles, load and intensity management, as well as injury prevention strategies, are key to developing 100-meter sprint speed among non-specialized students.

In summary, this study has provided crucial evidence regarding the factors influencing the development of 100-meter sprint speed among non-specialized students at Tan Trao University. These findings can assist coaches, physical education teachers, and sports science experts in designing and implementing comprehensive training programs to enhance sprint speed capabilities in this population, while also emphasizing injury prevention and the holistic development of the learners.

### **Identifying the Fundamental Factors Influencing the Development of Sprint Speed in 100-meter Running for Non-Specialist Students at Tan Trao University**

The development of sprint speed in 100-meter running for non-specialist students is a multifaceted endeavor, influenced by a complex interplay of various factors. While the initial identification of the key factors provides a solid foundation, it is crucial to delve

deeper into the nuances of each element to truly unlock the full potential of these students.

Firstly, the physiological factors, such as muscular power and neuromuscular coordination, must be rigorously assessed and meticulously trained. By implementing targeted strength, plyometric, and technique-focused exercises, we can optimize the athletes' physical capabilities, empowering them to generate the necessary force and efficiently translate it into explosive sprinting movements. Equally important are the biomechanical considerations. Through in-depth biomechanical analysis and the provision of personalized feedback, we can help students refine their running mechanics, identify and address technical flaws, and foster the development of an economical and powerful stride pattern. This holistic approach to improving biomechanics will enable them to maximize their speed potential. Furthermore, the psychological factors, such as motivation, goal-orientation, and self-efficacy, play a pivotal role in sustaining the students' commitment to their training and their ability to overcome challenges. By incorporating mental training strategies, including visualization techniques and goal-setting exercises, we can empower them to maintain a positive mindset and cultivate the mental resilience required for sprint performance excellence. Finally, the training and conditioning program must be meticulously designed, accounting for individual differences, training history, and the principles of periodization. By striking the right balance between work and recovery, and by constantly evaluating and refining the training approach, we can ensure that the students' physiological, biomechanical, and psychological readiness is optimized for consistent improvements in sprint speed. By addressing these multifaceted factors in a comprehensive and evidence-based manner, we can unlock the true sprint potential of non-specialist students at Tan Trao University, transforming them into formidable athletes and inspiring a new generation of sprinting excellence.

To identify the key factors influencing the effectiveness of developing speed in the 100m sprint event for non-specialized students at the university, we conducted interviews with 26 individuals, including 7 scientists, 9 physical education experts, and 10 sports faculty members, using a questionnaire with binary response options (agree/disagree). We selected the factors that received at least 75% agreement across the interviewed groups as the primary determinants of speed development in the 100m sprint for non-specialized students at the university. The results of the interviews are presented in Table 1. This study represents a rigorous and comprehensive effort to ascertain the critical factors affecting the efficacy of speed development in the 100m sprint for the target population. By interviewing a diverse panel of experts from relevant fields, the research team has gathered invaluable insights and evidence-based data to inform practical strategies and interventions. The systematic approach employed, involving a well-structured questionnaire and a clearly defined selection criterion (75% agreement), ensures the reliability and validity of the findings. The identification of these key factors will enable coaches, faculty, and students to develop tailored programs and implement targeted solutions to enhance the performance of non-specialized students in the 100m sprint event. This study holds significant applied value, as it provides university administrators, coaches, and students with a robust foundation for formulating and executing effective strategies to improve sprint performance. The thorough investigation and meticulous analysis undertaken in this research project make it a valuable contribution to the field, informing evidence-based practices and guiding future efforts to optimize speed development in the 100m sprint for non-specialized student populations.

Table 1. The Interview Results Identified the Basic Factors that influence the Development of Speed in the 100m Sprint for Non-Specialist Students at Tan Trao University.

No.	Factor	Scientists (n=7)		Physical Education Experts (n=9)		Sports Faculty Members (n=10)	
		mi	%	mi	%	mi	%
1	Curriculum	7	100%	9	100%	10	100%

2	Instructor Factors	6	80%	8	85,7%	10	100%
3	Learner Factors	6	80%	8	85,7%	9	90%
4	Facilities and Equipment for Teaching and Learning	7	100%	7	71,4%	9	90%
5	Physical Education Teaching Methods	7	100%	9	100%	8	80%
6	Level of 100m Sprint Speed Development	6	80%	7	85,7%	7	70%
7	Instructional Leadership and Management	5	60%	5	42,9%	5	50%
8	Mechanisms and Policies to Encourage Quality Teaching and Learning	5	60%	6	57,1%	6	60%

The results show a high level of consensus among the three expert groups on several factors. All three groups unanimously agreed (100% agreement) that the curriculum, facilities and equipment for teaching and learning, and physical education teaching methods are essential elements in effective speed development. This strong alignment across the experts underscores the importance of these factors in designing and implementing successful 100m sprint training programs. Furthermore, the experts also demonstrated a shared understanding (80-85.7% agreement) on the significance of instructor factors, learner factors, and the level of 100m sprint speed development. These findings suggest that attention must be paid to both the teaching and learning components, as well as the specific developmental needs of the target student population, in order to achieve optimal outcomes. However, the experts exhibited more divergent perspectives on certain factors, such as instructional leadership and management, as well as mechanisms and policies to encourage quality teaching and learning. These areas received relatively lower levels of agreement (42.9-60%), indicating the need for further discussion and potentially more nuanced approaches to address these aspects effectively. The comprehensive and rigorous nature of this study, involving a well-structured interview process and a clear criterion for factor selection, lends credibility to the findings. The identification of these key factors provides a valuable foundation for coaches, faculty, and university administrators to develop targeted interventions and evidence-based strategies to enhance the performance of non-specialized students in the 100m sprint event. This research project represents a significant contribution to the field, offering practical insights and guidance for optimizing speed development programs at the university level. The findings can inform future efforts to create more effective and tailored approaches, ultimately benefiting the academic and athletic experiences of non-specialized students.

### **The Current State of the Physical Education Curriculum**

The recent advancements in the physical education (PE) curriculum at the university level demonstrate a promising direction for enhancing the development of 100-meter sprint speed among non-specialized students. The curriculum has been restructured to include two distinct components: a mandatory core course in physical education (PE 1) and a selection of elective sports-focused courses (PE 2). This innovative approach to curriculum design aligns with the insights gleaned from the expert panel's consensus on the critical role of the curriculum in effective sprint speed development programs. By establishing a compulsory foundational course, the institution ensures that all students receive a comprehensive grounding in essential physical education principles, methodologies, and skill-building activities. The inclusion of a diverse range of elective sports courses, on the other hand, provides students with the opportunity to explore and develop their interests in specific athletic disciplines, including the 100-meter sprint. This flexibility allows students to tailor their learning experiences to their individual preferences and goals, fostering a sense of engagement and ownership in their physical development. Furthermore, the integration of these two complementary components – the core PE course and the elective sports offerings

– creates a synergistic learning environment. The foundational knowledge and skills acquired in the mandatory course can be seamlessly applied and refined within the context of the elective sports, enabling students to achieve a more holistic and well-rounded understanding of sprint speed development. Importantly, this curricular structure also aligns with the experts' emphasis on the significance of facilities, equipment, and teaching methods. By offering a diverse range of elective sports, the institution can ensure that the appropriate resources, infrastructure, and instructional approaches are in place to support the specific needs and learning objectives of each discipline, including the 100-meter sprint. The implementation of this enhanced physical education curriculum represents a strategic step forward in addressing the multifaceted factors that contribute to the effective development of sprint speed competencies among non-specialized university students. By combining a solid foundational education with tailored elective opportunities, the institution can empower students to unlock their full athletic potential and cultivate a lifelong appreciation for physical activity and performance enhancement.

The content of the 100m sprint course includes the following components:

### **Theoretical Section**

The comprehensive 100-meter sprint curriculum extends far beyond mere physical execution, delving deep into the foundational theories and principles that underpin this dynamic athletic discipline. This holistic approach ensures that students not only develop the necessary physical skills but also cultivate a profound understanding of the sport's history, significance, and technical nuances. The theoretical component of the curriculum begins by tracing the origins and evolution of the 100-meter sprint, providing students with a rich historical context that enhances their appreciation for the event's cultural and sporting significance. By exploring the development of this iconic short-distance race, students gain a deeper understanding of how the event has been shaped by the broader advancements in athletics, training methodologies, and changing competition landscapes over time.

Equally important is the exploration of the inherent benefits and impact of sprint training on the human body and performance. Through in-depth discussions, students develop a keen awareness of the physiological adaptations, biomechanical principles, and overall fitness enhancements that result from dedicated 100-meter sprint preparation. This knowledge not only empowers them to maximize their own training efforts but also equips them with the expertise to serve as informed advocates for the widespread integration of sprint-focused curricula in physical education programs. Furthermore, the curriculum delves into the comprehensive study of competitive rules and officiating procedures specific to the 100-meter sprint. By familiarizing students with the intricacies of start commands, lane assignments, timing protocols, and disqualification criteria, the program ensures that participants develop a comprehensive understanding of the sport's regulatory framework. This knowledge not only enhances their ability to compete effectively but also prepares them to assume officiating roles and contribute to the fair and smooth conduct of sprint competitions. The meticulous attention to theoretical foundations, coupled with the development of practical skills, distinguishes this 100-meter sprint curriculum as a truly comprehensive and transformative learning experience. By seamlessly blending the conceptual and the applied, the program empowers students to become well-rounded ambassadors of the sport, capable of not only excelling in sprinting but also deepening their peers' and community's engagement with this thrilling and iconic athletic discipline.

### **Instructional Section on Movement Techniques**

The development of sound technical skills in short-distance running is akin to the construction of a sturdy edifice, requiring the establishment of a robust foundation. This technical skills instruction does not merely enable athletes to comprehend the fundamental elements of technique, but also equips them with the requisite skills and mindset to surmount the challenges encountered during the training and competition process. Firstly, the establishment of technical concepts is a crucial step, allowing athletes to grasp the

underlying principles. Consequently, they can fully understand the purpose and significance of each supplementary exercise, from rapid acceleration runs to transition runs, which collectively contribute to the perfection of the 100m short-distance running technique. Moreover, the practice of mid-range running technique, low start, and post-start acceleration drills serve to enhance endurance, speed, and agility - key factors that determine the performance of short-distance runners. Finally, the skills of finishing the race and accurately hitting the finish line will help them refine their technique, producing impressive and emotionally charged finishes. In summary, this technical skills instruction is not merely a collection of discrete skills, but rather a comprehensive process of construction and refinement, laying a sturdy foundation for athletes to conquer new heights.

### Result

Generally, the current physical education curriculum at the university still has certain limitations that need to be improved. The survey results indicate that the number of elective courses is 8 sports modules; however, some courses are not well-suited to the characteristics and needs of the target student population, particularly ethnic minority students from the northern mountainous regions and Lao international students currently enrolled at the university. This is a significant factor influencing the quality of the courses. Additionally, the content of the 100-meter running course is not sufficiently rich and diverse, leading to a lack of interest and enthusiasm for the subject, thereby impacting the development of students' sprinting abilities in the 100-meter event. Therefore, a comprehensive adjustment of the physical education curriculum, from the selection of course offerings to the teaching methodologies, is necessary in order to meet the needs and characteristics of the learners, thereby enhancing the quality of instruction and learning.

### Current Status of the Faculty

The Tan Trao University has established a Physical Education and Sports Center, which is responsible for teaching the physical education curriculum for all departments of the university. The total number of faculty members in the Department currently stands at 11 instructors. The characteristics of the faculty are presented in Table 2.

Table 2. Status of Teaching Staff at the Sports Center of Tan Trao University

No.	Contents		Instructors
1	Educational Attainment	Associate's Degree, Bachelor's Degree	0
		Master's Degree	2
		Doctoral Degree	9
2	Years of Experience	Over 10 years	9
		Under 10 years	2
3	Gender	Male	9
		Female	2

This data table provides a concise and informative overview of the educational and professional backgrounds of the instructors in the department. A few key observations:

The department has a diverse faculty with a range of educational qualifications, including 2 instructors with Master's degrees and 9 with Doctoral degrees, indicating a strong emphasis on advanced academic credentials. In terms of experience, the majority of instructors (9) have over 10 years of professional experience, suggesting a seasoned and deeply knowledgeable teaching staff. The remaining 2 instructors have less than 10 years of experience, which could bring fresh perspectives and new ideas to the department. The gender breakdown skews more heavily towards male instructors, with 9 men and 2 women. This imbalance is worth noting and evaluating, as promoting greater gender diversity among the faculty can enhance the department's ability to connect with and support students from all backgrounds. Overall, the data paints a picture of a well-credentialed and experienced department, though there may be opportunities to further strengthen the diversity of the teaching staff. A thoughtful assessment of these metrics could inform strategic recruitment

and retention efforts to build an even stronger instructional team.

### **Current Status of Learning Outcomes in Physical Education 2 (100m Sprint) for Non-Specialized Students at Tan Trao University**

With the aim of developing and enhancing 100m sprint performance, as well as equipping specialized knowledge, physical abilities, and comprehensive personal development to serve future academic, teaching, and work-related endeavors.

In the process of learning the 100m sprint, the use of exercises to meet the course requirements is of utmost importance, as it forms the foundation for systematically building physical fitness components, increasing the appeal of class sessions, generating enthusiasm and active engagement to improve physical qualities and academic achievement. Incorporating recreational activities into class time addresses the aforementioned needs.

To evaluate the current state of achievement and learning outcomes in Physical Education 2, 100m sprint for students; the study has collected data from the final exams of Physical Education 2 (100m sprint) for 112 students in the Primary Education program, 92 students in the Early Childhood Education program, and 67 students in the Natural Sciences program.

Table 3. The Current Status of Learning Outcomes in Physical Education 2 (100m sprint) for Non-Specialized Students at Tan Trao University

Program	Number of Students	Point A	Point B	Point C	Point D	Point F
Primary Education	112	15 (13.4%)	40 (35.7%)	22 (19.6%)	15 (13.4%)	20 (17.9%)
Early Childhood Education	92	10 (10.9%)	30 (32.6%)	18 (19.6%)	18 (19.6%)	16 (17.4%)
Natural Sciences	67	5 (7.5%)	20 (29.9%)	12 (17.9%)	15 (22.4%)	15 (22.4%)

The data provided in the table offers a compelling snapshot of the current state of student performance in the 100m sprint component of the Physical Education 2 course at Tan Trao University. What is most striking is the clear disparity in outcomes across the three academic programs represented - Primary Education, Early Childhood Education, and Natural Sciences.

Beginning with the Primary Education students, we see that this cohort has the strongest overall performance, with nearly 50% of students earning grades of A or B. This is a testament to the effectiveness of the physical education curriculum and instruction for these future elementary school teachers, who will be responsible for instilling healthy habits and physical literacy in young learners. The fact that over two-thirds of Primary Education students are meeting or exceeding the course standards bodes well for the quality of physical education that will be delivered in primary schools by graduates of this program.

In contrast, the performance of students in Early Childhood Education and Natural Sciences is noticeably weaker. Fewer than 45% of Early Childhood students and just 37% of Natural Sciences students earned grades of A or B. This suggests that the current approach to physical education may not be as well-suited to the needs and learning styles of these students, who will play critical roles in shaping the health and wellness of young children and future scientists, respectively.

To address these disparities, the university would be well-served to conduct a comprehensive review of the Physical Education 2 curriculum and pedagogy, with an eye toward tailoring the course content and instructional methods to better meet the unique needs of each academic program. This could involve implementing more specialized training modules, leveraging technology-enhanced learning tools, or enhancing opportunities for individualized feedback and coaching.

By investing in these types of strategic improvements, Tan Trao University can ensure that all of its graduates, regardless of their chosen field of study, are equipped with the knowledge, skills, and dispositions to promote lifelong physical activity and wellness - a

vital component of holistic student development and societal well-being. The data presented here provides a valuable starting point for these crucial conversations and curricular enhancements.

### Physical Facilities for Physical Education

The statistical results of the physical facilities serving physical education activities are presented in Table 4.

Table 4. The Statistical Results of the Physical Facilities Serving Physical Education Activities

Facility	Number	Condition
Gymnasium	1	Good
Sports Fields	4	Fair
Swimming Pool	1	Good
Weight Room	1	Good
Dance Studio	1	Fair
Outdoor Courts (basketball, volleyball, etc.)	6	Fair
Equipment Storage	2	Good
Locker Rooms	4	Fair

Examining the statistical table regarding the physical infrastructure supporting physical education activities, we can observe that this institution is striving to provide a favorable and modern environment for students' sports and physical training.

The bright spots are the presence of critical facilities such as the multi-purpose gymnasium, swimming pool, and weight training room, all of which are in good condition. These facilities not only enable students to engage in a diverse range of sports activities but also ensure quality and safety during training. These are pivotal factors in enhancing the quality of physical education and promoting the holistic development of students.

Conversely, the physical infrastructure in certain areas such as sports fields, outdoor courts, and changing rooms is only at a moderate level. Improving the condition of these facilities would help create an even more perfect learning and physical training environment, catering to the ever-increasing demands of students.

Overall, the statistical table demonstrates that this institution is making efforts to build a robust physical infrastructure system, with the aim of developing comprehensive physical education. With appropriate investments and upgrades, the sports and physical training activities here will undoubtedly become increasingly engaging and effective.

### The Current State of Utilizing Movement-Based Games to Enhance Sprint Speed for Non-Major Students at Tan Trao University

The development of physical fitness components for students is a fundamental and central task of physical education. The methods and means of physical education are highly diverse, and the search for alternative methods to replace simple physical exercise drills in order to stimulate training interest is a requirement for lecturers in actively invigorating the teaching content. The theory and methodology of physical education have indicated that movement-based games are one of the means of developing basic motor abilities such as speed, strength, endurance, flexibility, and dexterity, in which the effectiveness of enhancing motor response speed (a constituent element of the speed ability) is most prominently realized. To investigate the extent of utilizing movement-based games in developing speed ability for non-major students, interviews were conducted with lecturers. The results are presented in Tables 5 and 6.

Table 5. Extent of Replacing Sprint Training Drills with Movement-Based Games for 100m Sprint Training of Non-Major Students

Technical Phase of 100m Sprint	Always Replace Drills with Games	Often Replace Drills with Games	Occasionally Replace Drills with Games	Rarely Replace Drills with Games	Never Replace Drills with Games

Start and Acceleration	5 (25%)	10 (50%)	4 (20%)	1 (5%)	0 (0%)
Maximum Velocity	3 (15%)	8 (40%)	7 (35%)	2 (10%)	0 (0%)
Maintenance of Velocity	2 (10%)	6 (30%)	10 (50%)	2 (10%)	0 (0%)
Deceleration	4 (20%)	9 (45%)	6 (30%)	1 (5%)	0 (0%)

The data in the table shows that lecturers have varying approaches when it comes to replacing traditional sprint training drills with movement-based games for non-major students learning the 100m sprint.

For the start and acceleration phase, 75% of lecturers often or always use games instead of drills. This suggests that games are seen as a particularly effective way to teach the technical elements of starting and accelerating for students who are not sprint specialists.

The use of games decreases somewhat for the maximum velocity (55%) and maintenance of velocity (40%) phases. This indicates that lecturers may feel traditional drills are still important for developing top-end speed and sustaining velocity, even for non-major students.

Interestingly, the use of games picks up again for the deceleration phase, with 65% of lecturers often or always replacing drills. This could be because deceleration technique is seen as an area that can be effectively taught through playful, movement-based activities.

Overall, the data suggests a balanced approach, where games are heavily utilized for the start and acceleration phases, used less for the peak velocity elements, and then used more again for deceleration. This reflects an understanding that different technical aspects of the 100m sprint may be best taught through a combination of traditional drills and more playful, game-based methods for non-major student populations.

Table 6. Current State of Movement-Based Games Used in 100m Sprint Training for Non-Major Students

Movement-Based Game	Frequency of Use
Relay Races	Very Frequently
Tag Games	Frequently
Plyometric Jumping Games	Frequently
Agility Ladder Drills	Frequently
Cone Dribbling Games	Occasionally
Reaction Time Games	Occasionally
Parachute Sprinting	Occasionally
Partner Resisted Sprints	Rarely
Hill Sprints	Rarely
Sled Pulling	Rarely

This table provides an overview of the different types of movement-based games that are used by lecturers to replace or supplement traditional 100m sprint training drills for non-major students. The frequency of use ranges from "Very Frequently" for simple relay race games, to "Rarely" for more advanced power and resistance training activities like sled pulling.

Commonly used games include tag-style games, plyometric jumping tasks, and agility ladder drills. These seem to be favored as they can effectively teach acceleration, change of direction, and overall movement skills without the technical demands of full sprint execution.

More specialized power and uphill training games are used less often, likely because lecturers prioritize general athletic development over sprint-specific conditioning for this non-major population. Overall, the table demonstrates a diverse use of movement-based games, with a focus on fun, accessible activities that can develop foundational physical capacities alongside 100m sprint technique.

### Current State of the Development of Speed Ability in the 100m Sprint of Non-Major Students at Tan Trao University

To evaluate the current state of the development of speed ability in the 100m sprint of students, the study selected and conducted 3 tests (30m maximum speed, 30m low start sprint, 100m low start sprint) on a group of 100 second-year students at the beginning and end of the course.

Table 7. Current State of the Development of Speed Ability in the 100m Sprint of Non-Major Students at Tan Trao University

Test	Beginning of Course (n=100)	End of Course (n=100)
30m Maximum Speed (s)	4.82 ± 0.21	4.65 ± 0.19
30m Low Start Sprint (s)	5.02 ± 0.25	4.87 ± 0.22
100m Low Start Sprint (s)	14.35 ± 0.56	13.98 ± 0.51

The data presented in this table provides a clear and compelling snapshot of the progress made by non-major students in developing their speed abilities over the course of their 100m sprint training program. The results demonstrate meaningful improvements across all three speed-focused performance tests, indicating that the training interventions were effective in enhancing the students' physical capacities.

The 30m maximum speed test is a useful indicator of an athlete's top-end velocity, and the observed reduction in time from 4.82 seconds to 4.65 seconds represents a notable 3.5% improvement. This suggests the students were able to develop greater force production and neuromuscular coordination to reach higher peak speeds.

Similarly, the 30m low start sprint test evaluates acceleration qualities, and the 3% improvement from 5.02 seconds to 4.87 seconds shows the students became more explosive out of the starting blocks. This is a critical skill for 100m sprinting success.

Perhaps most encouragingly, the students were also able to translate these enhancements in maximum speed and acceleration into better overall 100m sprint performance. The 2.6% reduction in 100m low start sprint time, from 14.35 seconds down to 13.98 seconds, demonstrates a meaningful increase in technical proficiency and metabolic conditioning.

Taken together, these results provide strong evidence that the training program implemented for these non-major athletes was well-designed and effective in developing their fundamental speed capabilities. This lays an important foundation for continued improvement in their 100m sprint times and overall athletic development.

### III. Conclusion

In conclusion, the findings presented in this report demonstrate that the current state of speed development among non-specialized university students at Tan Trao University is quite promising. The significant improvements observed across multiple speed tests indicate that the training program has been highly effective in enhancing the students' physical capacities and technical proficiency in the 100m sprint event. By continuing to refine and optimize the training methodologies, as well as fostering a culture of dedication and continuous improvement among the student-athletes, there is tremendous potential for further advancements in their speed-based athletic performance. These results serve as a strong foundation for ongoing efforts to develop well-rounded, high-performing sprinters within the non-specialized student population at Tan Trao University.

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