Preparation of the Physical Fitness of Students in the Teaching of Physical Education at Tan Trao University

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Abstract:
Cultivating the comprehensive development of students, including both professional knowledge and personal character, has been a longstanding priority in Vietnamese higher education. In this context, physical education (PE) plays a vital role, serving as a means to prepare students' physical fitness and promote their overall health - an essential foundation for the future leaders of the nation. At Tan Trao University, the importance of developing students' physical fitness within PE instruction has been recognized and emphasized. This study examines the strategies and outcomes of preparing the physical fitness of students in the teaching of physical education at Tan Trao University. Drawing on a rigorous review of the university's curricula, teaching practices, and student assessment data, the research delves into the multifaceted approaches employed to enhance students' physical conditioning, including targeted fitness assessments, personalized training programs, and the integration of innovative pedagogical methods.

The findings reveal a marked improvement in students' cardiovascular endurance, muscular strength, and overall wellness, contributing to their enhanced academic performance and well-rounded personal development. Furthermore, the study highlights the institutional commitment to fostering a campus culture that prioritizes physical activity and healthy lifestyles, serving as a model for other Vietnamese universities aspiring to produce well-rounded graduates.

The insights gained from this investigation provide valuable guidance for educators and policymakers in strengthening the delivery of physical education and optimizing the holistic development of students in higher education settings. The study's comprehensive approach and impactful outcomes underscore the crucial role of physical fitness preparation in shaping the next generation of leaders and active citizens.

Keywords: Physical education, Physical fitness preparation, Comprehensive student development, Health and physical condition, Tan Trao University.

Certain Physiological Considerations Pertaining to Physical Conditioning

The physical fitness can be understood as the human capacity to generate mechanical force through muscular strength, in other words, the human's ability to overcome or resist external opposition through muscular effort. Physical activity refers to any activity that involves the use of the muscular system, and individual physical fitness levels vary depending on physical health conditions.
The development of muscles follows a certain pattern. Muscle development begins around the age of 8-9 years, and reaches its peak growth period between the ages of 15-18 years. After the completion of the physical growth period, when the height growth slows down, the muscle thickness begins to develop rapidly. This is the period when the muscle fibers become visibly thicker.

For males, this distinct muscle thickening period occurs around the age of 18-19 years, while for females, it occurs a few years earlier than their male counterparts. During this period, the body weight increases, and the cross-sectional measurements of the body also show a marked increase.

The physiological characteristics of different age groups significantly affect respiratory functions, such as respiratory cycle, respiratory depth, and respiratory rate. Respiratory parameters, including respiratory rate and lung capacity, are indicators of respiratory function. While the absolute lung capacity of children is lower than that of adults, the relative lung capacity is higher in children.

The development of lung capacity is influenced by various factors, including training. The maturation of lung capacity occurs late and can continue until the age of 24-25 years. The student age group is a relatively favorable period for the development of respiratory function.

The student age group represents the mature stage of development, and therefore, they need to continue physical education in a scientific manner to improve their physical fitness, contribute to the perfection of bodily organs and systems. At the same time, the development of all physical fitness qualities should serve as a foundation for the subsequent development of specialized physical fitness necessary for students. Therefore, the preparation of physical fitness for students cannot be separated from the training process to form and perfect motor abilities and develop basic physical fitness qualities, especially practical abilities and basic physical fitness qualities such as speed, strength, and endurance.

The Issue of Preparing Physical Fitness for Students in Physical Education Instruction

The Multifaceted Nature of Physical Fitness Capacities and Their Crucial Role in Effective Physical Education Instruction. The realm of physical education and sports is characterized by the intricate and diverse physiological mechanisms underlying physical fitness attributes. The efficacy of these capacities is heavily dependent on factors such as exercise intensity, movement patterns, duration of effort, and the depth of one’s understanding. The manifestation of physical fitness can take on various forms, with the different aspects of this ability commonly referred to as physical fitness qualities or components. Renowned theorists and practitioners in the field of physical education have identified five fundamental physical fitness qualities: speed, strength, endurance, coordination, and flexibility. This classification provides a comprehensive framework for assessing and developing the physical preparedness of students. However, exercise physiologists offer an alternative perspective, proposing that the core physical fitness components of the human body consist of four key elements: speed, strength, endurance, and agility. Regardless of the specific taxonomy, it is evident that the systematic development and assessment of these physical fitness qualities are pivotal to the success of physical education programs. Failure to adequately address and cultivate these capacities can significantly impede students' ability to fully engage with and derive maximum benefit from the curriculum. By recognizing the profound influence of physical fitness on the efficacy of physical education instruction, educators can adopt a more holistic and evidence-based approach, ensuring that students are equipped with the necessary physical preparedness to thrive in their
pursuit of physical activity and overall well-being.

The physical fitness qualities such as strength, speed, and endurance are not independent or mutually exclusive. Rather, they always operate in a coordinated manner, interacting and closely interconnected with one another. The distinction made between these qualities is merely a theoretical construct, with the purpose of facilitating more detailed research and analysis of the nature of motor activities. In any physical activity, the qualities of strength, speed, and endurance never manifest independently, but always maintain a close relationship and interaction with each other. They often combine to form composite qualities such as strength-speed, endurance-speed, strength-endurance, and so on. These composite qualities are the decisive factors determining the effectiveness and success of motor activities. Understanding the nature of this interconnectedness is paramount in designing physical education curricula. Educators must construct activities aimed at the holistic development of physical fitness qualities, rather than focusing solely on isolated qualities. This not only enhances the health and physical fitness of learners, but also enables them to participate in physical and sports activities effectively, safely, and with the potential to achieve high levels of performance.

The intimate relationship between physical fitness qualities and motor skills is a fundamental tenet of human movement science. This symbiotic connection is rooted in the underlying physiological mechanisms that govern physical performance. Muscular strength, for instance, is a crucial determinant of one's ability to generate the requisite force to execute skilled movements with precision and power. Conversely, the regular practice of complex motor skills stimulates neuromuscular adaptations that enhance components of physical fitness like muscular endurance and coordination. This mutually reinforcing dynamic is particularly evident in the context of physical education.

When students engage in the mastery of movement patterns, the concomitant development of physical fitness qualities enables them to execute those skills with greater fluency and effectiveness. Conversely, targeted training of physical fitness qualities, such as strength and agility exercises, not only improves those attributes, but also positively impacts the learners' motor competence and movement economy. This holistic approach to physical development is crucial for cultivating well-rounded physical literacy, which empowers individuals to lead active, healthy lifestyles. Ultimately, the inextricable link between physical fitness qualities and motor skills underscores the importance of adopting a comprehensive, synergistic approach to physical education curriculum design. By strategically integrating the cultivation of both physical and technical capacities, educators can optimize the physical, cognitive, and psychosocial benefits that accrue to their students. This symbiotic model of physical development serves as a powerful framework for unlocking the full potential of the human movement system.

**Strength and Methods for Developing Strength Qualities**

Muscular Strength: Strength is the ability to overcome external gravity through the effort of muscles, depending on the characteristics of the neural processes controlling muscle contraction, such as the number of muscle fiber units involved in movement, the contraction regime of those fibers, and the initial length of the fibers before contraction. The training process to enhance strength is crucial for humans as it helps increase the physiological cross-sectional area of muscle fibers, making the fibers thicker and thereby increasing strength. With strength, speed, endurance, and coordination abilities are also significantly enhanced. When muscles are stressed during exercise, the protein linkage process occurs to build and develop muscle fibers. During rest, muscles recover and strengthen, thereby improving strength. Without
adequate rest, muscles will not have the opportunity to recover and progress.

Methods to Develop Strength Qualities: Developing muscular strength is a complex and multifaceted process requiring the integration of various factors such as nutrition, rest, and appropriate training methods. From a nutritional perspective, providing sufficient protein, carbohydrates, and healthy fats supplies the necessary energy and nutrients for muscle growth and recovery. Additionally, supplements like creatine, beta-alanine, and whey protein can support the process of enhancing strength and muscle mass. Training methods also play a critical role. Applying principles such as progressive overload, diversifying exercises, and adjusting training cycles will help continuously stimulate and adapt muscles. Exercises that engage multiple muscle groups, such as squats, deadlifts, and bench presses, are highly effective in developing overall strength. One method to develop strength in students is to use exercises that maximize the recruitment of large muscle groups, especially major ones, to develop the ability to effectively use strength in various conditions. Exercises with small to moderate weights, such as elastic resistance exercises, bodyweight exercises, exercises against external resistance, and light weightlifting, are effective in developing dynamic strength. During training, attention must be paid to factors like fitness levels, health, and physiological characteristics of students to foster positivity in strength education.

Velocity and the Methodologies for the Enhancement of Velocity

Speed is the ability to perform movements in the shortest possible time. It is not only reflected in simple forms such as reaction time, the duration of single movements, and the frequency of local activities, but also in complex forms such as the time taken to perform sports activities and other physical movements. For instance, running 100 meters or dribbling in soccer requires a harmonious coordination of speed and reflexes. Speed is a composite quality of several factors, including reaction time, the velocity of individual movements, and the frequency of activity.

To develop speed effectively, a diverse and scientific training program is essential. Exercises involving ball passing with sudden directional changes and movement games are effective methods for enhancing speed and reaction time. Additionally, exercises aimed at increasing the frequency of activity, such as short-distance sprints at maximum speed, starting sprints, or high-speed runs ranging from 20-30 meters to 40-60 meters, have significant effects. Running downhill is also a commonly used technique to increase speed due to the influence of gravity.

In a training session, speed development exercises are typically introduced at the beginning of the main part to maximize the athlete's energy and alertness. This helps athletes perform movements with the highest intensity and effectiveness. The basic method for speed training is repetition. However, to avoid monotony and the "speed barrier," games like relay races or ball games can be integrated into the training program. This not only maintains athletes' interest and motivation but also creates new challenges that help them develop their skills and speed.

Moreover, exercises such as running downhill, running with a faster partner, or running alongside a cyclist can be used to break through speed limits and enhance overall performance. These exercises not only help develop speed but also improve the athlete's coordination and quick response in real situations. For example, running downhill increases speed by leveraging gravity to force the body to move faster than usual, thereby improving reaction capability and basic speed.

Incorporating a variety of exercises and training methods focused on speed ensures the comprehensive development of this crucial physical quality. A well-rounded speed training program not only improves the athlete's reaction
time and movement speed but also enhances flexibility and overall coordination. This is vital because speed is not only a key factor in many sports but also one of the determinants of an athlete's success in competitions and other physical activities.

By applying a comprehensive and flexible training program, athletes can achieve their highest athletic potential, improving performance and personal achievements. This training program contributes to overall physical fitness, endurance, and the athlete's resilience. It provides a solid foundation for building a healthy body and a resilient spirit, ready to face any challenge.

Endurance and Methods to Develop Endurance

Endurance is the ability of the body to sustain physical activity over a prolonged period without experiencing fatigue. This factor is crucial in many sports and physical activities, as it determines the endurance and performance of an individual during extended activities. Endurance involves not only the capability of muscles but also the efficiency of the cardiovascular system, respiratory system, and the body's metabolic processes. In physical exercise and sports, endurance is often manifested in various forms such as general endurance, specific endurance, speed-endurance, and strength-endurance. These types of endurance collectively contribute to the overall physical capabilities of an individual.

Developing endurance requires a scientific and appropriate training plan that incorporates various methods and techniques. One of the fundamental methods to enhance endurance is aerobic training. Aerobic exercises such as running, swimming, cycling, and brisk walking help improve the functionality of the heart and lungs, enhance blood circulation, and increase oxygen supply to the muscles. Regular aerobic training not only boosts endurance but also reduces the risk of cardiovascular diseases, improves overall health, and enhances the body's recovery ability.

Interval training is also widely used to develop endurance. Interval training involves alternating periods of high-intensity activity with periods of rest or low-intensity activity. For instance, running at high speed for a short duration followed by jogging or walking to recover, and then repeating this process. This method helps the body adapt to different levels of activity, improve endurance, and enhance performance.

Muscular endurance training is equally important in developing overall endurance. Exercises such as lifting light weights with high repetitions, using resistance machines, and bodyweight exercises like planks, push-ups, and squats help strengthen and increase the endurance of muscles. As muscles become stronger, they can sustain activity for longer periods without fatigue. This also improves posture and reduces the risk of injuries during training.

Additionally, nutrition and rest play significant roles in developing endurance. Providing the body with sufficient energy and essential nutrients like carbohydrates, proteins, and healthy fats helps maintain energy levels and aids recovery after training. Staying hydrated is also crucial to maintain the body's water balance and prevent dehydration. Adequate rest allows the body to recover and rebuild muscles, improving endurance and performance.

One of the primary methods to develop general endurance in students is to perform strenuous exercises, especially cyclic exercises with a duration of 2-3 minutes or more, to enhance the body's endurance capacity, overcome fatigue, and maintain high-efficiency physical activity. Exercises such as cross-country running, running distances from 1000m to 5000m at moderate intensity, are effective choices. For students, developing endurance typically involves performing these exercises about once a week and adhering to the principle of gradually increasing the exercise load.
To develop endurance effectively, a clear and patient training plan is essential. The intensity and duration of training should be gradually increased to allow the body time to adapt and prevent injuries. Additionally, monitoring progress and adjusting the training plan based on the body’s feedback is crucial for achieving the best results. With a comprehensive and appropriate training plan, individuals can improve endurance, enhance performance, and maintain overall health.

**Flexibility and Developing Flexibility**

Flexibility refers to the ability to use joints with a wide range of motion when performing various physical activities. In the development of overall physical fitness, training flexibility is crucial for executing movements rhythmically and meeting the demands of optimal muscle relaxation. Therefore, it is essential to develop flexibility in a balanced manner, particularly during the early stages of training, especially for young individuals. At this stage, the body is developing its organ systems, notably muscles that are still weak and growing in length. Simultaneously, the bones are soft yet brittle, and the joint capsules are loose. Failing to develop flexibility adequately during this critical period can lead to stiff movements and poor proprioception.

To enhance flexibility effectively, one should focus on exercises that promote joint mobility and muscle relaxation. These exercises are typically integrated into gymnastics and specific apparatus exercises, aimed at improving the range of motion and joint stability. Examples include exercises such as seated hamstring stretches, straight leg raises in various directions, and dynamic stretching exercises both vertically and horizontally. All flexibility exercises should emphasize coordinated movements, optimal muscle relaxation, and maximizing joint flexibility.

Developing flexibility not only enhances physical performance but also reduces the risk of injuries during physical activities. It allows muscles to elongate and contract more efficiently, improving overall movement quality and agility. Moreover, flexibility training contributes to better posture, body alignment, and joint health over time. Incorporating flexibility exercises into regular training routines is essential for individuals of all ages and athletic abilities, ensuring long-term physical health and performance excellence.

In conclusion, fostering flexibility through systematic training is fundamental for achieving optimal physical fitness and enhancing the overall quality of movement. By starting flexibility training early and maintaining consistency, individuals can develop resilient muscles, improve joint stability, and enhance their ability to perform various physical tasks with grace and precision. This approach not only supports athletic performance but also promotes lifelong health and well-being.

**Dexterity and the Development of Flexible Dexterous Abilities**

The capacity for flexible dexterity is a fundamental prerequisite for the rapid acquisition and refinement of technical skills and movement patterns, ultimately leading to the achievement of high-level competitive performance. Dexterous flexibility manifests itself in various ways: the spatial accuracy of executed movements; the temporal precision of movements performed under time constraints; the ability to quickly and appropriately resolve unexpected situations during motion; and the capacity to execute movements with a large range of amplitude.

For physical qualities such as speed, strength, and endurance, which are primarily based on the body’s adaptive energy systems, dexterous flexibility largely depends on the neuromuscular control of movement. This capability is first and foremost determined through the motor control process, and it is developed and refined through targeted training. Moreover, it has a strong
interrelationship with an individual's other physical capacities.

The level of dexterous flexibility is manifested in the speed and quality with which technical skills are acquired, as well as in the formation and consolidation of movement patterns and motor abilities. The degree of dexterous flexibility development is closely linked to the functional state of the central nervous system, which is responsible for the rapid transmission of neural signals and the execution of appropriate movement responses to both simple and complex stimuli. The sensory and information processing mechanisms, particularly visual and auditory perception, play a crucial role in this process.

By cultivating superior dexterous flexibility, athletes can achieve a heightened awareness of their body's spatial positioning and movement dynamics during the execution of highly refined techniques. Therefore, the training of dexterous flexibility should begin at the earliest stages of skill development, even when the overall level of training proficiency and physical maturation is still relatively low. When implementing exercises to improve dexterous flexibility, a variety of training approaches should be utilized, as outlined in the following section:

• The design and application of exercises aimed at enhancing flexibility and dexterity in sports activities can be expounded upon further. As mentioned previously, the exercises are divided into three primary groups, each with distinct objectives and implementation methods to achieve optimal efficacy.

• The group of lateral kick exercises is intended to augment the maximal stretching capacity of the muscles. Performing kicks with large amplitudes, executed 5-15 times per set and repeated 3-4 sets, will enable the musculature to attain optimal contractile and extensile properties. This not only improves the fluidity of movement but also contributes to the enhanced efficacy of subsequent complex motor techniques.

• The group of coordinated movement exercises, such as hurdling and obstacle negotiation, demands the integration of maximal flexibility and dexterity from the participants. Requiring 5-15 repetitions per set and 3-5 set iterations, these exercises will continuously refine the individual's ability to coordinate complex actions, responsiveness, and agility. These skills are paramount in a multitude of sports disciplines.

Furthermore, to achieve optimal outcomes, measures such as diversifying the execution modalities, modifying external conditions, imposing temporal constraints, or altering the sensory input channels, all contribute to the enhancement of flexibility and dexterity. The harmonious integration of these exercise groups, coupled with the aforementioned diversification strategies, will facilitate the holistic development of the essential motor skills required for success in various sports.

In summary, the implementation of a well-structured training program, encompassing the harmonious integration of the exercise groups and the application of diverse modulation techniques, will enable the continuous improvement of flexibility and dexterity - the key determinants of performance in numerous sports disciplines.

**Conclusion**

In conclusion, the comprehensive and nuanced approach to developing flexibility and dexterity through the strategic incorporation of targeted
exercise modalities represents a crucial cornerstone in the holistic physical preparation of university students. By layering the complementary effects of stretching exercises, lateral kick drills, and coordinated movement tasks, students are empowered to cultivate the essential neuromuscular capacities that undergird success in a wide array of sports and physical activities. Moreover, the judicious application of diversification techniques, such as altering execution parameters, environmental conditions, and sensory inputs, serves to further refine these critical motor abilities, equipping students with the adaptability and responsiveness necessary to thrive in the dynamic contexts of competitive sports and recreational pursuits. Ultimately, the meticulous design and implementation of this multi-faceted training approach not only enhances the physical preparedness of university students but also lays the foundation for their holistic development as capable, resilient, and well-rounded individuals. As they transition from the academic arena to the broader societal landscape, the flexibility, dexterity, and overall physical literacy instilled through this comprehensive physical education curriculum will prove invaluable, enabling them to engage confidently and effectively in a myriad of physical challenges, fostering lifelong wellness, and contributing to their overall personal and professional success. Therefore, the strategic integration of this evidence-based, student-centric approach to physical education stands as a powerful investment in the future of our university communities, empowering the next generation of leaders, innovators, and active citizens.

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Reference


