

DEVELOPING SPEED ABILITY IN CHILDREN AGED 5–6 WITH PHYSICAL DISABILITIES THROUGH ADAPTIVE PHYSICAL EDUCATION TECHNOLOGIES

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Abstract

The development of physical qualities in early childhood is a key task of sports science and physical education pedagogy. Speed ability is one of the fundamental motor qualities that determines the efficiency of movement execution, reaction time, and overall physical readiness. Children aged 5–6 with physical disabilities often experience limitations in motor activity, which negatively affects the formation of speed ability and reduces their participation in physical education.

This study aims to scientifically substantiate the effectiveness of adaptive physical education technologies for developing speed ability in preschool children with physical disabilities. The research is based on theoretical analysis, pedagogical modeling, and observation. The findings indicate that systematic application of individualized, safe, and play-based speed-oriented exercises contributes to improved reaction speed, motor coordination, and functional activity. The results may be applied in preschool educational institutions and adaptive physical education programs.

Keywords: adaptive physical education, speed ability, preschool children, physical disabilities, sports science, motor development.

Introduction. In contemporary sports science, the formation of physical qualities during preschool age is considered a crucial stage for long-term physical development and health. The age of 5–6 years is characterized by intensive development of the nervous system, high neuroplasticity, and rapid acquisition of motor skills. During this sensitive period, the development of speed ability occurs most effectively under appropriate pedagogical conditions. Speed ability is defined as the capacity to perform motor actions in minimal time and to respond quickly to external stimuli. From the perspective of sports pedagogy, speed is closely associated with reaction time, movement frequency, and coordination. For children with physical disabilities, insufficient development of speed ability leads to reduced motor independence, low

physical activity, and difficulties in social adaptation. In recent years, inclusive and adaptive physical education has gained increasing attention worldwide. In this context, the development of scientifically grounded adaptive physical education technologies aimed at improving speed ability in children with physical disabilities is a pressing issue. This research is conducted in accordance with state priorities in physical education and sports development, including inclusive approaches promoted by **Shavkat Mirziyoyev**, emphasizing equal opportunities for all children to engage in physical activity.

Literature Review. Scientific research in sports pedagogy indicates that speed ability develops most intensively in early childhood due to the functional maturity of the central nervous system. Motor development theories highlight preschool age as a critical period for forming basic motor qualities such as speed, agility, and coordination.

American researchers emphasize that traditional physical education programs often fail to meet the needs of children with physical disabilities because they do not adequately account for individual functional limitations. As a result, children may experience either excessive physical load or insufficient motor stimulation. Adaptive physical education is defined as a system of physical activities modified according to the functional capabilities of individuals with disabilities. Studies show that adaptive programs are most effective when they include short-duration exercises, high-frequency repetitions, and emotionally engaging tasks.

Speed-oriented exercises are particularly effective when integrated into play-based activities that enhance motivation and reduce psychological barriers. Despite extensive research on adaptive physical education, limited attention has been paid specifically to the development of speed ability in preschool children with physical disabilities. Most studies focus on general motor development or rehabilitation, which highlights the relevance of the present research.



Figure. Adaptive physical education technology for developing speed ability in children aged 5–6 with physical disabilities

The figure presents a three-stage adaptive physical education model (preparatory, main, and consolidation stages) aimed at improving speed ability through individualized and safe motor activities, considering the functional capabilities of preschool children with physical disabilities.

Methodology. The study is based on theoretical analysis, pedagogical modeling, and observation methods commonly used in sports science research. Adaptive physical education technologies were designed considering the age characteristics, functional capabilities, and safety requirements of children aged 5–6 with physical disabilities.

The methodological principles of the study include:

- individualization of physical load;
- gradual progression of exercise intensity;
- emphasis on reaction speed and movement initiation;
- integration of speed-oriented tasks into play-based activities;
- ensuring emotional comfort and motivation.

Adaptive exercises were selected to stimulate rapid motor responses without causing excessive physical strain. Visual and auditory signals were used to improve reaction speed, while short movement tasks were applied to develop movement frequency and coordination.

Adaptive Physical Education Technology for Speed Development The proposed adaptive physical education technology is structured in a последователь and systematic manner, ensuring safe and effective development of speed ability.

Table 1. Structure of Adaptive Physical Education Technology for Speed Development

Stage	Content of Activities	Pedagogical Purpose
Preparatory stage	Simple movements, reaction to visual and auditory signals	Preparation of neuromuscular system
Main stage	Speed-oriented games, short-distance movements	Development of reaction speed and movement frequency
Consolidation stage	Repetitive play-based speed tasks	Stabilization of speed ability

This structure allows for gradual adaptation and consistent improvement of speed ability while considering the functional limitations of children with physical disabilities.

Results and Discussion. Pedagogical observation demonstrated positive dynamics in the development of speed ability among children participating in adaptive physical education programs. Improvements were observed in reaction time, movement initiation, and overall motor responsiveness. Children showed increased motivation and confidence during physical activities, which is an important psychological factor in adaptive sports pedagogy. From a sports science perspective, early stimulation of speed ability through adaptive methods creates a foundation for further physical development and supports inclusive education practices. The findings confirm that speed ability can be effectively developed in children with physical disabilities when exercises are appropriately structured, individualized, and systematically applied.

Conclusion. The study confirms that adaptive physical education technologies play a significant role in developing speed ability in children aged 5–6 with physical disabilities. The use of individualized, safe, and play-based speed-oriented exercises contributes to improved motor performance, reaction speed, and overall physical activity. The proposed technology can be recommended for implementation in preschool educational institutions and adaptive physical education programs.

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