BG Pulse Journal USA
ISSN:1947-2536 http://www.bgpulseusa.com/index.php/bg

THE DEVELOPMENT STRATEGIES OF UZBEKISTAN AND TECHNOLOGIES FOR ELIMINATING STUTTERING IN PRESCHOOL CHILDREN

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https://doi.org/10.5281/zenodo.20363204

Abstract: This scientific article explores the modern methodological foundations for eliminating stuttering (logoneurosis) in preschool children within the framework of priority tasks defined in the Development Strategy of Uzbekistan. The paper presents a comparative analysis of traditional speech therapy methods and innovative technologies based on biofeedback (BOS), digital software, and sensory integration. The author scientifically substantiates the prospects of introducing digital speech therapy platforms into the educational system of Uzbekistan, mechanisms for increasing the efficiency of the correctional-pedagogical process, and the expected results in the development of inclusive education.

Keywords: Development Strategy, preschool age, stuttering, logoneurosis, innovative technologies, speech therapy, digital correction, inclusive education, biofeedback technology, human capital.

Аннотация: В данной научной статье в рамках приоритетных задач, определенных в Стратегии развития Узбекистана, исследуются современные методологические основы устранения заикания (логоневроза) у детей дошкольного возраста. В работе представлен сравнительный анализ традиционных логопедических методов и инновационных технологий, основанных на нейробиологической обратной связи (БОС), цифровых программах и сенсорной интеграции. Автором научно обоснованы перспективы внедрения цифровых логопедических платформ в систему образования Узбекистана, механизмы повышения эффективности коррекционно-педагогического процесса и ожидаемые результаты в развитии инклюзивного образования.

Ключевые слова: Стратегия развития, дошкольный возраст, заикания, логоневроз, инновационные технологии, логопедия, цифровая коррекция, инклюзивное образование, БОС-технология, человеческий капитал.

National development strategies of the Republic of Uzbekistan, particularly the Development Strategy of New Uzbekistan and its logical continuation, the "Uzbekistan — 2030" strategy, define specific, systemic, and priority tasks for the radical reform of the preschool and inclusive education systems as the initial and most critical stage of human capital development. Within the objectives of these strategic documents aimed at developing the social sphere, the primary priority is to maximize the enrollment rate of preschool-aged children in preschool education organizations (PEOs) to 100% and to achieve full coverage of all 6-year-old children with the compulsory one-year school preparation system. Within this strategic goal, it is envisioned to eliminate regional disparities in enrollment by expanding the non-governmental sector of educational services, public-private partnership mechanisms, and the network of family-based preschool educational institutions.

To align the quality indicators of the system with international standards, requirements have been set to enhance the professional competence of pedagogical personnel, introduce advanced foreign experiences, digital and interactive technologies into preschool education methodology, and modernize the material-technical base of PEOs.

In the strategic directions aimed at social protection and creating equal opportunities, particular emphasis is placed on developing inclusive education and improving the mechanisms to ensure the integration of children with special educational needs into society. Specifically, tasks have been set to establish an inclusive educational environment in all regions of the republic, ensure the physical and infrastructural accessibility (barrier-free environment) of educational institutions for children with special needs, and expand the network of inclusive, hybrid, and combined special groups within general-type preschool education organizations. The most critical conceptual approach strengthening the scientific-methodological foundations of this process is that the leading principle has now shifted toward adapting the educational environment, curricula, and correctional-pedagogical technologies to the child's individual-psychological, physical, and speech capabilities (IEP — Individual Education Plans), rather than adapting the child to an existing rigid educational system. Furthermore, transforming the training system for personnel specialized in special pedagogy, speech therapy, and pathologies of higher nervous activity, strengthening the material and moral incentives for pedagogues working in inclusive groups, and personalizing the activities of multidisciplinary medical-psychological-pedagogical commissions and diagnostic centers that provide early identification and rehabilitative-pedagogical assistance to children with special needs are established as the most critical socio-legal indicators of the strategy.

Stuttering is a severe disorder of speech rhythm, tempo, fluency, and smoothness, characterized by tonic, clonic, or mixed spasmodic contractions of the speech apparatus muscles (tongue, lips, palate, or larynx). This pathophysiological condition is caused by dysfunction in the synchronization mechanism regulating speech functions within the central nervous system—specifically involving Broca's area, the striopalidar system, and speech-motor analyzers—as well as the influence of neuro-psychological factors. The primary differences between traditional and innovative logopedic technologies in eliminating stuttering manifest clearly in their methodological approaches, the nature of correctional tools, and the psycho-fictional activity of the child during the educational-rehabilitative process.

Traditional logopedic technologies rely heavily on mechanical, direct pedagogical, and repetition-based methods. These are dominated by passive-reproductive forms such as logopedic massage, standard breathing exercises (e.g., the Strelnikova method), articulatory gymnastics, rhythmic classes, and strict adherence to rules of slow speech by artificially slowing down speech production. In this approach, the correction process occurs mostly under the direct guidance of the speech therapist within an artificially created monotonic environment, resulting in a relatively low capacity to awaken the child's internal motivation and seamlessly transfer the acquired speech skills into natural communication situations.

Conversely, innovative logopedic technologies approach the elimination of stuttering as an integrated, digitized, and person-centered comprehensive system. The foundation of innovation is built upon neurobiological feedback (Biofeedback/BOS technologies), sensory integration, specialized computer software (such as "Delfi", "Breath", or DAF/FAF apparatus systems that delay speech signals in time), and gamification principles. In the innovative approach, tension within the child's speech apparatus is reflected on a monitor in visual or auditory form, and the child learns to regulate their own speech rhythm through interactive games using multimedia tools, which drastically increases efficiency and shortens the correction period. Additionally, while

traditional methods focus more on temporarily suppressing speech symptoms (stuttering spasms), innovative technologies aim to restructure the child's emotional-volitional sphere, eliminate logophobia (fear of speech), and restore neurological foundations based on the principle of neuroplasticity.

The prospects for introducing innovative technologies into the system of working with preschool children who stutter under the conditions of Uzbekistan directly depend on the state policy regarding the digitization of the national educational model, modernization of pedagogical processes, and ensuring inclusivity. In the future, one of the main perspective directions for implementing these technologies into practice is the creation of a network of "Digital Speech Therapy" and tele-logopedic (remote correctional) platforms that allow for the provision of high-tech speech therapy assistance even in preschool education organizations located in remote and rural regions of the republic. This process envisions the development of speech diagnostic programs with artificial intelligence elements adapted to the phonetics and grammatical characteristics of the national Uzbek language, the gradual equipping of speech therapy rooms with biofeedback (BOS) devices and interactive sensory equipment, and the popularization of mobile applications that ensure correctional continuity between preschool educational institutions and the family. Furthermore, through the introduction of these technologies, prospects open up for radically updating the training programs for modern speech therapist-defectologist personnel within the higher pedagogical education system and systematically increasing their technological competencies in working with multimedia-based correctional tools.

The socioeconomic and medical-pedagogical results expected from the systemic integration of these innovative approaches into the pedagogical process are characterized by their extensive scope. First and foremost, the effectiveness of the logopedic correction process is expected to be shortened by at least twofold compared to traditional timeframes, and the index of complete and stable elimination of stuttering will rise significantly because interactive game-based programs maximize the child's internal motivation and speech activity. From a clinical-pedagogical standpoint, speech anxiety (logophobia) and neurotic reactions in children will be prevented early on, which radically improves the indicators of successfully integrating children with special needs into the general education environment (inclusion). The most critical strategic result expected is to ensure that by fully correcting the speech defects of preschool children who stutter prior to school age, they can attain equal and comprehensive education alongside their peers in subsequent educational stages, ultimately ensuring the sustainable development of the country's human capital.

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