CORRECTIVE-PEDAGOGICAL APPROACHES TO DEVELOPING AUDITORY-SPEECH SKILLS IN VISUALLY IMPAIRED CHILDREN

Sobirova Subinsoxon Muxsinjon kizi
Fergana State Technical University, Assistant, Department of Higher Mathematics
subinsosobirova9810@gmail.com

Abstract. This article provides a scientific analysis of corrective-pedagogical approaches aimed at developing auditory-speech skills in visually impaired children. Methods for forming auditory-speech functions are examined based on the theory of compensatory mechanisms, principles of special pedagogy, and modern audiological technologies. The results of experimental work conducted in special educational institutions of the Fergana region are presented. The findings confirm the necessity of organizing the development of auditory perception in visually impaired children on the basis of a differentiated approach.

Keywords: visually impaired children, auditory-speech skills, corrective pedagogy, compensatory development, typhlopedagogy, audiological technologies, differentiated education, special education.

INTRODUCTION

The widespread introduction of an inclusive approach in the modern education system necessitates special attention to the developmental needs of children with special educational requirements, particularly visually impaired children. According to World Health Organization data, millions of children worldwide have varying degrees of visual impairment, which directly affects their perception of the environment, socialization, and speech development. As a result of the insufficiency of the visual analyzer, compensatory mechanisms - most notably the auditory analyzer - assume a leading role in such children.

Scientific research indicates that the formation and development of speech in visually impaired children is often delayed or has distinctive characteristics. The main reason lies in the fact that, due to the absence of visual support, children's representations of objects and phenomena are not adequately formed. Consequently, vocabulary becomes limited, difficulties arise in the use of grammatical structures, and problems emerge in the logical and coherent expression of speech. For this reason, developing auditory-speech skills is considered one of the most important directions in the education and upbringing of children in this category.

Corrective-pedagogical approaches are aimed at systematically developing the processes by which visually impaired children receive, process, and verbally express

information through hearing. Such approaches involve the use of specialized methods, didactic tools, and innovative technologies. In particular, opportunities for developing auditory and speech skills are expanding through the use of audio materials, tactile tools, the Braille system, and information and communication technologies.

At the same time, practical experience shows that the insufficiency of existing methodological support for working with visually impaired children, the level of teachers' specialized training, and the incomplete implementation of individual approaches further increase the urgency of this problem. Therefore, developing and implementing effective corrective-pedagogical approaches for the development of auditory-speech skills is an important scientific and practical task.

The issue of developing auditory-speech skills in visually impaired children is one of the most pressing directions in modern special pedagogy and typhlopedagogy. Due to the absence or significant restriction of binocular vision, such children rely more heavily on the auditory analyzer when obtaining information about the world around them, engaging in communication, and carrying out educational activities.

The Law of the Republic of Uzbekistan "On Education" (2020) and the legislative acts "On Special Education" guarantee the right to education for children with disabilities, including visually impaired students. Within the framework of the state program for the development of inclusive education for 2022–2026 in our country, the infrastructure of special educational institutions is being expanded and the quality of corrective-pedagogical services is being improved.

Research in the fields of pedagogy and special pedagogy (L.S. Vygotsky, A.R. Luria, V.I. Lubovsky, and others) has substantiated the compensatory patterns of child development under conditions of sensory deficiency, emphasizing that it is possible to activate cognitive processes by developing auditory and speech activities. In particular, corrective-pedagogical work organized on the basis of L.S. Vygotsky's "zone of proximal development" theory is recognized as an effective tool for expanding the existing potential of children.

As Vygotsky L.S. (1983) emphasized, a primary defect - damage to the visual analyzer - triggers a chain of secondary deficiencies: spatial orientation becomes more difficult, speech development slows, and distinctive characteristics of auditory perception are formed. For this reason, the purposeful development of auditory-speech skills in visually impaired children makes it possible to activate compensatory mechanisms.

The aim of this article is to scientifically analyze effective corrective-pedagogical approaches to developing auditory-speech skills in visually impaired children and to elucidate their practical effectiveness.

The scientific novelty of the research lies in the fact that the set of corrective-pedagogical approaches has been constructed for the first time on the basis of a

differentiated principle - that is, taking into account the degree of visual impairment and the characteristics of speech development. Furthermore, a synthesis of modern audiological technologies and traditional typhlopedagogical methods was implemented within the context of the national education system.

LITERATURE REVIEW AND METHODOLOGY

The issue of compensatory development in visually impaired children has been examined by classical defectologists such as L.S. Vygotsky, A.R. Luria, and M.I. Zemtsova. Zemtsova M.I. (1973) demonstrated that visually impaired children are capable of expanding their possibilities for perceiving the surrounding environment through the organs of hearing, and that this process is further accelerated under conditions of special education.

D.A.Toshpanova (2018), one of the founders of Uzbek typhlopedagogy, investigated the role of auditory reception in forming the speech activity of visually impaired students. The researcher demonstrated that the combination of speech therapy work and auditory exercises in special educational institutions yields positive results.

J.G.Yuldoshev (2019), in his monograph, thoroughly examined the application of interactive methods in special educational institutions, describing auditory training programs designed for visually impaired children. The author particularly emphasizes the role of computer and digital tools in corrective education.

A.A.Kholiqov (2021) proposed a systematic model of psychological-pedagogical support for children with visual impairments in an inclusive educational environment, substantiating its applicability to the field of auditory-speech skill development as well.

M.R.Saidova (2020) studied the theoretical foundations of corrective pedagogy and scientifically substantiated the necessity of a differentiated approach to teaching visually impaired children. The researcher described a methodology for composing an individual corrective route for each student.

In the international arena, a number of important studies exist in this direction. Corn A.L. and Koenig A.J. (1996) summarized the results of many years of observations on the development of compensatory senses - particularly hearing - in visually impaired children and offered practical recommendations. Hatlen Ph. (2000) developed the concept of the "core curriculum" and recognized auditory-speech competence as one of the central elements of typhlopedagogical education.

B.R.Qodirov (2017) investigated the possibilities of applying pedagogical technologies in defectological education. As a result of this research, electronic modules for auditory training designed for visually impaired children were developed.

T.M. Mirsoatov (2016) compiled methodological manuals on developing communicative speech in children, describing the structure of corrective sessions.

Sh.Q.Hasanov (2022) analyzed the current state and development prospects of typhlopedagogy, specifically highlighting the necessity of creating a scientific-methodological base for developing auditory-speech skills in special educational institutions in Uzbekistan. This consideration served as the primary motivation for the present research.

O.T.Rahimov (2023) studied the latest trends in the psychology and pedagogy of special education and experimentally proved the positive corrective effect of music therapy and rhythm exercises in working with visually impaired students.

METHODOLOGY

The research was conducted at the No. 1 Special General Education Boarding School in the Fergana region and at the Special Education Laboratory of Fergana State Technical University. A total of 64 visually impaired students aged 6–14 participated in the study.

Participants were divided into three groups according to the degree of visual impairment: (1) completely blind children (n=22); (2) children with residual vision (n=26); (3) children with low vision (n=16). A differentiated corrective program was developed for each group.

The following set of methods was used to address the objectives of the research:

- Theoretical methods: analysis, synthesis, and comparative study of scientific literature, regulatory-legal documents, and methodological manuals.
- Diagnostic methods: an adapted version of the Snellen visual acuity chart, audiometric examination, a standardized protocol for assessing speech development (approved by the Uzbekistan Typhlopedagogy Center), observation, and interviews.
- Experimental methods: ascertaining, formative, and control experiments. Children in the experimental group were taught according to a specialized corrective program, while the control group received instruction under the conventional curriculum.
- Mathematical-statistical methods: Student's t-test, correlation analysis (Pearson's r coefficient), and data processing with SPSS 25.0.

The corrective-pedagogical program consisted of the following four main blocks: (1) auditory differentiation exercises; (2) development of speech perception; (3) enrichment of lexical-grammatical structures; (4) formation of communicative competence. The program comprised 5 sessions per week, each lasting 40 minutes, for a total duration of 6 months.

In adherence to research ethics standards, written consent was obtained from the parents and legal guardians of the children. All data were processed on the basis of an anonymization principle.

RESULTS AND DISCUSSION

During the ascertaining experiment stage, the initial state of auditory-speech skills in visually impaired children was assessed. The results showed that 77.3% of completely blind children experience difficulty with auditory differentiation, while 61.5% of children with residual vision demonstrated underdevelopment of phonemic hearing. This indicator is 2.3 times higher than that of their peers studying in general education institutions.

At the conclusion of the formative experiment, the results of the experimental and control groups were compared. The main indicators are presented in the following table:

Indicator	Experimental Group (%)	Control Group (%)
Auditory differentiation (high level)	78.1	41.2
Phonemic hearing indicator	74.3	38.6
Improvement in speech rate and accuracy	69.5	31.4
Growth in communicative competence	72.8	36.7
Growth in lexical richness index	65.2	29.5

Table 1. Results of the comparison between experimental and control groups

Statistical analysis conducted using Student's t-test confirmed that the differences between the experimental and control groups were statistically significant ($p < 0.01$). This demonstrates the high effectiveness of the developed corrective-pedagogical program.

Observational results showed that children engaged in the corrective program achieved noticeable progress not only in auditory-speech skills, but also in their overall academic performance and social communication. In particular, completely blind children demonstrated the highest results in sessions that incorporated elements of music therapy.

Correlation analysis between auditory and speech indicators (Pearson $r = 0.74$, $p < 0.001$) confirmed a strong positive relationship between the development of auditory differentiation and the improvement of speech accuracy. This result suggests that targeted auditory training can simultaneously stimulate speech development.

DISCUSSION

The obtained results allow for a number of important theoretical and practical conclusions. First and foremost, the research provided practical confirmation of Vygotsky L.S.'s (1983) theory of compensation: damage to the visual analyzer can be compensated by enhancing the functional capabilities of the auditory analyzer, but this process does not occur spontaneously - it takes place through specially organized corrective-pedagogical intervention.

Second, the effectiveness of the differentiated approach was confirmed. The arguments concerning the necessity of adapting the corrective program according to the degree of visual impairment, as presented in the works of D.A. Toshpanova (2018) and M.R. Saidova (2020), were experimentally proven by this research.

Third, the ideas advanced by J.G. Yuldoshev (2019) and B.R. Qodirov (2017) regarding the integration of digital audiological technologies into the corrective process were validated in practice. Auditory training implemented using specialized software yielded results that were statistically significantly higher than those of traditional methods.

The research also had a number of limitations: the relatively small sample size, the restriction of the observation period to 6 months, and the fact that it was conducted within a single region - the Fergana region. A follow-up study with a larger number of participants and across multiple regions is recommended for the future.

From an international comparative perspective, the general patterns of auditory compensation in children with visual impairments identified by Corn A.L. and Koenig A.J. (1996) were also observed in this research. However, in the context of Uzbekistan, the specific characteristics of the national education system, cultural-linguistic factors, and available infrastructure must be taken into particular account.

The conclusions of O.T.Rahimov (2023) regarding the effectiveness of music therapy were also confirmed in this research: musical rhythm exercises had a noticeably positive effect on the improvement of speech tempo and intonation. This reinforces the view that music therapy should be more widely utilized in typhlopedagogical education.

CONCLUSION

This research presented a scientifically grounded and experimentally validated system of corrective-pedagogical approaches aimed at developing auditory-speech skills in visually impaired children. The main conclusions are as follows:

- Without a differentiated approach, the development of auditory-speech skills in visually impaired children does not occur sufficiently on its own.

- In order to activate compensatory mechanisms, a systematic set of corrective sessions aimed at developing auditory differentiation, phonemic hearing, and lexical richness is necessary.
- Incorporating modern audiological technologies and elements of music therapy into the corrective educational process significantly improves students' auditory-speech indicators in a statistically meaningful way.
- Programs differentiated according to the degree of visual impairment must be developed and implemented separately for each group.
- Strengthening the scientific-methodological base of typhlopedagogical education in special educational institutions of Uzbekistan - including the development of national normative indicators for auditory-speech development - is of pressing importance.

The following recommendations are given for the practical implementation of research results:

- Incorporate an auditory training program into the corrective-pedagogical service system of special educational institutions.
- Organize early diagnosis and corrective support for visually impaired children of preschool age.
- Introduce a joint work model for typhlopedagogists and speech therapists.
- Conduct specialized seminars for parents and educators on auditory-speech development.

In future research, it would be appropriate to study the age-related dynamics of the development of auditory perception in visually impaired children, to conduct a comparative analysis across different regions, and to investigate the possibilities of applying artificial intelligence-based auditory training programs in typhlopedagogical education.

REFERENCES:

1. Vygotskiy L.S. Osnovy defektologii. Pedagogika, Moskva. 1983. – 368 b.
2. Toshpanova D.A. Ko‘zi ojiz o‘quvchilarning nutq faoliyatini shakllantirishda eshituv qabulining roli. Fan va texnologiya, Toshkent. 2018. 192 b.
3. Yo‘ldoshev J.G‘. Maxsus ta'lim muassasalarida interfaol usullar: monografiya. FarDU nashriyoti, Farg‘ona. 2019. 215 b.
4. Xoliqov A.A. Inklyuziv ta'lim muhitida ko‘rish qobiliyati cheklangan bolalarga psixologik-pedagogik yordam: tizimli model. TDPU nashriyoti, Toshkent. 2021. 176 b.
5. Saidova M.R. Korreksion pedagogikaning nazariy asoslari va differentsial ta'lim. SamDU nashriyoti, Samarqand. 2020. 244 b.

6. Qodirov B.R. Defektologik ta'limda pedagogik texnologiyalar: amaliy qo‘llanma. O‘qituvchi, Toshkent. 2017. 158 b.
7. Mirsoatov T.M. Bolalarda nutqiy kommunikatsiyani rivojlantirish: metodik qo‘llanma. Yangi asr avlodi, Toshkent. 2016. 128 b.
8. Hasanov Sh.Q. Tiflologiyaning hozirgi holati va rivojlanish istiqbollari // Maxsus ta'lim: muammo va yechimlar. 2022. №3. B. 45–59.
9. Rahimov O‘.T. Musiqa terapiyasi va ritm mashqlarining korreksion ta'siri: eksperimental tadqiqot // Defektologiya. 2023. №1. B. 22–34.
10. Zemtsova M.I. Uchitelyu o detyax s narusheniyami zreniya. Prosveshcheniye, Moskva. 1973. 159 b.
11. Corn A.L., Koenig A.J. Foundations of Low Vision: Clinical and Functional Perspectives. AFB Press, New York. 1996. 452 p.
12. Hatlen Ph. The core curriculum for blind and visually impaired students // Journal of Visual Impairment & Blindness. 2000. Vol. 94. No. 3. P. 25–37.
13. O‘zbekiston Respublikasi "Ta'lim to‘g‘risida"gi Qonun (2020-yil 23-sentabr). – O‘zbekiston Respublikasi Qonun hujjatlari ma'lumotlar bazasi, Toshkent. 2020.
14. O‘zbekiston Respublikasi "Maxsus ta'lim to‘g‘risida"gi Qonun (2020-yil 12-may). O‘zbekiston Respublikasi Qonun hujjatlari ma'lumotlar bazasi, Toshkent. 2020.