

TECHNOLOGIES CREATING A SENSORY ENVIRONMENT FOR LEARNERS WITH DISABILITIES

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Abstract. *The legal and normative foundations of inclusive education, the content and conditions of the sensory environment created in the educational organization are covered in the article. Assistive computer technologies created for students with special educational needs who are blind, hearing impaired, and have disorders of the locomotor system are described as the main tools of the sensory environment.*

Keywords: *disability, disabled children, social adjustment, height-adjustable table.*

Inclusive education is a modern educational paradigm aimed at providing pedagogical conditions suitable for the needs of persons with disabilities and health restrictions in the general education system so that they can receive quality education. In the sustainable development of the inclusive education system, the existence of legal and regulatory frameworks, modern material and technical framework creating a sensory environment, educational and methodological support, optimal socio-pedagogical support and psychological environment is of great importance. In accordance with the norms of international law, in Article 50 of the Constitution of the Republic of Uzbekistan, provision of inclusive education and upbringing in educational organizations of children with special educational needs is strengthened by the state. In the Law "On Education" (Articles 9, 15, 20, 34, 38, 46, 52, 55), inclusive education is defined as a form of education that provides equal opportunities for all learners to receive education in accordance with their special educational needs and individual capabilities. the rules are reinforced[1,2].

At the moment, on the basis of the privileges granted by the state, approximately 1% of the total number of students studying in higher education institutions are persons with disabilities in hearing, sight, locomotor organs, and also disabled due to somatic diseases. Therefore, providing education using special pedagogical approaches, alternative methods and tools remains one of the urgent tasks in order to ensure that this category of people get proper education, personal development, occupation and social adjustment. Adaptive educational programs for persons with disabilities, use of innovative educational technologies, special textbooks, training manuals and didactic materials, as well as the use of assistive technologies designed for collective and individual use, provision of tutor services that provide necessary support to learners, building and provision of free movement in buildings - standard conditions are listed [3,4, 5].

Ramps, handrails, automatic doors, mobile lifts and other equipment serve to ensure the free movement of students with health restrictions. In the process of inclusive education, an optimal sensory environment is created based on an individual approach in accordance with the needs and capabilities of learners with different nosologies, and assistive (assistive) technologies: special technical tools and programs are used to equip the auditorium and workplaces. Adaptive assistive technologies, including computer tools, can help students with learning disabilities work successfully using a variety of information and learning materials on an equal footing with other

students. Modern computer tools are technically adapted for use by students with problems in the musculoskeletal system as follows [4]:

1. Computer keyboard. A customized wireless computer keyboard, used with the Clevy SimplyWorks pad, provides convenient command input. Usually, this wireless device in various colors is connected to a SimplyWorks receiver so that it functions as a computer mouse button.

2. Keyboard keys are distinguished by their large size (20mm x 20mm) and significant distance between them. Thanks to the deeper location on the keyboard surface, it is possible to avoid pressing several keys at the same time.

3. Joystick-manipulator is used with various devices, it performs various control functions as an alternative type of computer mouse (input device). Depending on the needs of learners, a ball or a handle is used to direct the mouse cursor. The handle provides directed movements of the cursor by turning in different directions, and the buttons perform input commands.



4. Roller mouse or trackball. Trackball is a mouse emulator with a large ball in the middle, which requires little effort and minimal movement to control. The ball can be moved with any part of the palm. Five buttons symmetrically placed on the surface of the trackball perform the functions of the left and right mouse buttons, as well as double-click and paste operations. The device can also be adjusted according to the speed and directions of the cursor movement according to the individually oriented tasks.

The trackball is connected to the rear panel with a perекlyuchatel, and its large buttons perform the functions of the left and right buttons of a traditional mouse.



5. Specially adapted furniture for students with disorders of the base movement system - height-adjustable table, table with microlift, table surface with adjustable width, special stellar (handle), etc. facilitates the work of persons with disabilities.

An optimal sensory environment is created for students with low hearing ability (deaf and hard of hearing) with the help of sound engineering tools. Radio and audio equipment, which serve to convey the necessary information in a form convenient for students, are also used for the restoration and correction of hearing. Wireless audio equipment does not restrict the free movement of participants in the educational process, which is especially important for physical education and music classes.

Digital FM systems with the possibility of signal processing - transmitters for learners, inductive receivers - all this provides perfect wireless communication and information exchange

in the educational process. During general lectures, hearing impaired students use individual loudspeakers, where a special regulator ensures that the volume is adjusted according to the needs of the learners and the acoustic characteristics of the room.

Information induction systems, microphones, speakers, etc. creates an environment where hearing aid users can hear sound clearly. For this, individual sound amplifiers are switched to "T" mode, induction systems are installed in common and sports halls, as well as in classrooms. When hearing-impaired students are present in a hall or classroom, free-diffusion sound field systems are an important tool, in which loudspeakers ensure that the sound is distributed evenly throughout the room, while the sound from the sound source is transmitted directly to the cochlear implant or hearing aid.



Teaching-methodical and didactic materials used in higher education institutions are presented in visual form, textbooks, blackboards and contour maps, as well as models and various graphic materials, which are difficult for blind students to perceive. For the adaptation or alternative transmission of the visually presented material, taking into account the special needs of the visually impaired learners, special typhotechnical tools are used.

A necessary condition for equipping the workplace of a visually impaired student is to make it possible to use special software for working with a computer, as well as adapted devices. Using Screen Access (SuperNova) programs, it will be possible to overcome the lack of educational information. Also, visually impaired users are supported with Braille display, high quality speech synthesizer, screen magnifier and other software options.

A Braille display is used for Braille input, receiving textual information from a computer, tablet or smartphone. Braille printers provide the output of graphic and textual information on special paper in the form of Braille font, special software is used for its correct operation.

Innovative scanners that can recognize the text on the pages of textbooks (books, magazines) and read it aloud serve to read in many languages and in different voices. Portable or stationary video amplifiers allow visually impaired learners to read text and familiarize themselves with small images.



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