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Management of information software systems in the corrective work with children with disabilities

Gestión de sistemas de software de información en el trabajo correctivo con niños con discapacidades

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ABSTRACT:
This article considers the possibilities of using information technologies in the work with children with disabilities. In the modern progressive society, the development of computer literacy is becoming essential not only for secondary school students, but also for children with disabilities. The study presents a variety of positive trends in the use of information and computer technologies, including in the organization of distance learning for children with disabilities: the diversity of the educational material supply, the simplification of lesson explanation, the possibility of activating the interest and activity of students as well as the assistance in the process of their socialization.
Key words: children with disabilities, information and computer technologies, corrective work, distance learning, new teaching approaches, electronic resources

RESUMEN:
Este artículo considera las posibilidades de utilizar las tecnologías de la información en el trabajo con niños con discapacidades. En la sociedad progresista moderna, el desarrollo de la alfabetización informática se está convirtiendo en esencial no sólo para los estudiantes de secundaria, sino también para los niños con discapacidades. El estudio presenta una variedad de tendencias positivas en el uso de la información y las tecnologías informáticas, incluyendo en la organización de la educación a distancia para niños con discapacidades: la diversidad de la oferta material educativa, la simplificación de la lección explicada, la posibilidad de activar el interés y la actividad de los estudiantes así como la asistencia en el proceso de su socialización.
Palabras clave: niños con discapacidades, información y tecnologías informáticas, trabajo correctivo, aprendizaje a distancia, nuevos enfoques docentes, recursos electrónicos

Currently, computer technologies allow people with disabilities (speech, hearing, vision, intellectual, musculoskeletal disorders, etc.) to use them for training and interpersonal communication. The variety of defects, their clinical, psychological and pedagogical manifestations suggest the use of different correction methods that take into account the patterns and features of the development of children with disabilities. Various computer technologies are of help to specialists: auxiliary, adaptive and rehabilitation devices for the development and compensation of impaired, weakened or lost human functions and capabilities.

For people experiencing motor difficulties, a number of additional settings for standard keyboards or additional programs are provided, giving them the ability to create and edit texts on the computer. These special programs make it possible to perform operations using one finger, while the standard keyboard requires a key combination (for example, Ctrl, Alt, Shift, etc.).

With the help of medical and pedagogical support for children with disabilities, the Republican Scientific and Practical Center for Social Adaptation and Vocational Rehabilitation was transformed to the National Scientific and Practical Center for Correctional Pedagogy. This center carries out research activities to develop special education, to transit to inclusive education as well as to elaborate special educational programs, textbooks and teaching materials. The development of the system of inclusive education is one of the priority areas of the State Program of Education Development in the Republic of Kazakhstan for 2011-2020.

In Kazakhstan, there are 39 special kindergartens and 315 special groups, involving more than 15,000 preschool children, as well as 106 special schools and 1,219 special classes in general education schools, involving 25,000 students. Currently, 17 rehabilitation centers, 133 psychological and pedagogical correction offices and 558 speech therapy school centers provide correction-pedagogical support to children with disabilities.

Currently, in the Republic of Kazakhstan, there are 138,513 children with disabilities under the age of 18 (2.8% of the total number of children), including children of school age – 93,740 and preschool age – 44,773.

One of the surveys showed that more than 68% of the Kazakhs believe that children with disabilities should study in the usual environment in order to develop faster and join society (Corporate blog eGov.kz).

For users with motor disabilities, there has been created a special software for standard keyboards with special settings to disable the repetition of a symbol in the event that a key is not released for a long time when pressed, as well as keyboards with an increased size of keys for those who find it difficult to reach the keys of the standard keyboard or, on the contrary, miniature keyboards – for people with a limited range of hand movements.

Such wide possibilities of computer technologies promote their use at various stages of the corrective work in various fields of knowledge and make special pedagogy a promising area. The creation of psychological and pedagogical conditions for the use of specialized computer technologies, supporting the correctional and educational process at all stages, allows for the significant improvement of its effectiveness. The introduction of new computer technologies in the teaching and educational process leads to a radical change in the functions performed by the teacher, a change in the methodological basis of teaching and the revision of organizational forms of education.

Thus, in correcting developmental disorders, computer equipment makes it possible to use technologies for sound processing and converting as well as making feedback based on the principles of polysensory and systemic effects. In addition, specialized computer technologies help to identify and correct individual difficulties and problems in educational activities, to develop communication skills and to acquire knowledge independently.

General principles and rules of the corrective work

1. Individual approach to each student.

2. Prevention of the onset of fatigue, by using a variety of means (alternation of mental and practical activities, presentation of material in small parts, application of interesting and colorful didactic material as well as visual aids).

3. Use of the methods that activate the cognitive activity of students, develop their oral and written speech and form the necessary training skills.

4. Manifestation of the pedagogical tact. Constant encouragement for the slightest success,

timely and tactical help to each child, development of students' belief in their own strengths and capabilities.

The effective methods of corrective impact on the emotional and cognitive sphere of children with developmental disabilities are as follows:

- game situations;

- didactic games related to the search for specific and generic attributes of objects;

- game trainings promoting the development of the ability to communicate with others;

- psycho-gymnastics and relaxation helping to remove muscle spasms and actions, especially in the face and hands.

Most students with disabilities have an insufficient level of cognitive activity, the immaturity of motivation for learning activity, and a reduced level of efficiency and independence. Therefore, the search for and the use of active teaching forms, methods and techniques is one of the necessary means to improve the efficiency of the corrective-development process in the work of the teacher.

Information and communication technology in education (ICT) is a complex of educational materials, technical and instrumental computer-based means in the educational process, forms and methods of their application for the improvement of the activity of educators and specialists in educational institutions (administration) and for the development, diagnostics and correction of children. The informatization of preschool education opens up new opportunities for teachers to introduce new methodical developments aimed at the intensification and implementation of innovative ideas of the educational process in teaching practice. The efficiency of computerization in preschool educational institutions depends both on the quality of the applied pedagogical software tools and on the ability to use them rationally and skillfully in the educational process. The informatization of education is a great opportunity for the manifestation of the creativity of teachers, motivating them to look for new, non-traditional forms and methods of interaction with children, which increases the interest of children in learning, activates their cognitive activity and develops them in a comprehensive manner. The possession of new information technologies will help the teacher to feel comfortable under the new socio-economic conditions. There are many advantages of using ICT in the work of the modern teacher:

1. Selection of illustrative material for joint organized activities with children and for the design of stands, groups, offices (scanning, the Internet, printing, presentation).

2. Selection of additional cognitive material.

3. Exchange of experience, acquaintance with periodicals and developments of other teachers.

4. Registration of group documentation and reports. The computer will make it possible not to write them every time – it will be enough to type the scheme once and then only correct it.

5. Creation of presentations in the PowerPoint program to increase the effectiveness of co-organized activities with children and the pedagogical competence of parents in the process of holding parent meetings.

When creating a single database of methodological and demonstration materials, the teacher has more free time. As a result of the work on the introduction of information technologies, the following advantages of ICT in relation to traditional learning tools can be noted:

- ICT provides an opportunity to expand the use of e-learning tools, as they transmit information faster;
- Movement, sound and animation attract the attention of children for a long time and increase their interest in the subject studied. The high dynamics of training facilitates the effective assimilation of material as well as the development of children's memory, imagination and creativity;
- ICT provides visual aids, which contribute to the perception and better memorization of material, which is very important, taking into account the visual-figurative thinking of preschool children. This

includes three types of memory: visual, auditory, and motor;
- Slideshow and video clips show those examples from the surrounding world, whose observation causes difficulties: for example, the growth of a flower, the rotation of planets around the Sun, or the movement of waves;
- ICT helps to simulate life situations that cannot (or are difficult to) be shown and seen in everyday life (for example, reproduction of the sounds of nature, work of transport, etc.);
- The use of information technology encourages children to carry out exploratory activities, including searching on the Internet on their own or together with their parents;
- ICT provides additional opportunities for working with children who have limited opportunities. The use of computer technologies makes it possible to make activities attractive and truly modern as well as to solve cognitive and creative tasks, based on visual aids.

ICT can be used at any stage of joint organized activities:

- At the beginning of the lesson to indicate the topic by using questions on the subject studied and creating a problematic situation;
- As a follow-up to the teacher's explanation (presentations, diagrams, drawings, video fragments, etc.);
- As an informational and educational guide;
- To control the assimilation of material by children.

Currently, the use of ICT in educational activities with preschool children has become a prerequisite for the education and social adaptation of children, especially of those with disabilities. Innovative technologies help to support the motivation of children, to interest them in obtaining and solidifying new knowledge as well as to find their niche in the surrounding society. By realizing these technologies in the educational process, the following tasks can be solved:

- Improvement of the quality of the educational and corrective-developing work with preschool children with disabilities;
- Development of children's intellectual, emotional potential and positive personal qualities, compensation of their primary disorders and correction of secondary deviations.
- Formation of the motivation and maintenance of children's interest during direct educational activities.
- Acquisition of practical computer skills by children.

The overcoming of systemic speech underdevelopment, as a rule, has a long and complex dynamics. Therefore, the use of specialized computer technologies in the correctional and educational process, with regard to the patterns and features of the development of children with general speech underdevelopment, makes it possible to improve the efficiency of correctional training, accelerate the process of preparing preschool children for literacy studying, and prevent the occurrence of secondary written word disorders. The game for preschool children is the leading activity in which their personality is manifested, formed and developed. The computer here also has wide opportunities, since properly selected developing computer games and tasks primarily serve as game, rather than educational, activities for the child. The use of non-traditional methods and techniques, such as multimedia presentations, in the corrective work prevents fatigue and supports cognitive activities in children with various speech pathologies, as well as increases the efficiency of speech therapy work in general. Their use in speech therapy is interesting, informative and exciting for children. The screen attracts their attention, which sometimes cannot be achieved in the frontal work with children.

There have been created a range of electronic educational resources such as computer-based speech therapy programs, computer educational games, multimedia presentations, audio material in the following areas of work:

- Formation of pronunciation.
- Development of phonemic perception, mastering of reading and writing elements.
- Formation of the lexical and grammatical means of the language.
- Development of coherent speech.

- Development of articulatory motor skills, speech breathing, health-saving technologies.

Thus, electronic resources, in comparison with traditional methods, make the process of speech correction more efficient and dynamic, since tasks are presented in a game, interactive form. All this increases the motivational readiness of children for studying, which positively affects the results of speech therapy work. Electronic resources are based on the following principles:

- Game;
- Interactivity;
- Polysensory influence, i.e. auditory perception of information is combined with support for visual control, which allows for the use of safe analyzers and enables the creation of effective compensatory mechanisms;
- A differentiated approach to teaching that contains a number of tasks different in volume and complexity and can be customized;
- Objectivity that allows the initial data of the state of the corrected function to be fixed.

The organization of the education of people with disabilities on the basis of new information technologies (NITs) is connected with the implementation of the following basic principles of computer-based training:

1. Activation of students' independent cognitive activity, increase of its efficiency and quality.

The basis for implementing this principle is the use of innovative teaching methods. They make it possible to create an open system of training, in which the learner is given the opportunity to choose a suitable program and teaching technology.

This feature is explained by the need to increase the adaptability of the learning system to the individual psychophysical characteristics of the child with disabilities. With such an organization of the learning process, training becomes flexible, not connected with a rigid curriculum and compulsory classroom activities. The introduction of NITs in the education of individuals with disabilities is related to the solution of tasks of the material and technical plan, the main purpose of which is to ensure maximum access of the child with disabilities to educational information systems. In this case, the main technical training tool is a computer (computer system), which is equipped with regard to the user's individual capabilities (motor, sensory, perceptual) and educational needs.

2. Interactivity of the computer-based training system using NITs.

The use of computer-based learning tools allows the learner to receive information regardless of spatial and temporal limitations, to be in constant consultation with various sources of information as well as to carry out various forms of self-control. This greatly contributes to the creation of conditions for the social rehabilitation of people with disabilities.

3. Multimedia computer-based training systems.

The organization of training for people with disabilities with the use of NITs is based on the ability to provide multimedia computer-based learning tools that enable the activation of learners' compensatory mechanisms based on the persistent types of perception, taking into account the principle of a polysensory approach to overcoming developmental disabilities.

Of great help to the teacher in preparing and conducting lessons is the Microsoft Office package, which includes the well-known Word text editor, the Access database system and PowerPoint presentations. The Word text editor helps the teacher to prepare handouts and didactic material. Electronic presentations enable the teacher to make visual aids for the lesson with minimal preparation and little time. Lessons made on the basis of Microsoft PowerPoint are spectacular and effective in working on information.

Currently, a number of questions are being raised about distance education; it is questioned and widely debated. However, this form of work is not used widely among schoolteachers.

The UNESCO predicts that in the 21st century, secondary school students will spend only 30-

40% of time at school, 40% of time will be provided for distance education, and the rest of time – for self-education: hence the growing interest in distance learning within the framework of university and school education, as well as in the system of professional development. Distance education is understood as the organization of training, in which the student gets access to teaching materials and advice of the teacher at any time and regardless of place or residence (Vlasova and Pevzner, 1998).

Of particular importance is to focus on the possibilities of distance education for children with disabilities. The introduction of computer technologies will make it easier for specialists to work on correcting children's disorders, help them quickly and painlessly "join" their surroundings as well as allow children with disabilities to obtain available information in a more modern way. The use of computer technologies enables children to develop their skills in a new kind of activities – working on the computer themselves. The ability to provide an individual approach to teaching, the selection of the adequate pace and way of knowledge acquisition for each child, and therefore the provision of individual systemic assistance – that is the sense of applying computer technologies in correctional pedagogy.

Computer work, including with distance educational resources, stimulates the intellectual activity of children, develops spatial thinking, memory, logic, attention, teaches to work independently, make decisions and cope with the task in hand, as well as helps to develop better fine motor skills (Bolshakova, 2009).

Teachers working with students remotely should perform the same general tasks as their colleagues do in the traditional learning environment with the category of children with disabilities, but their spatial distance from students means that a number of learning problems take on specific forms. For example, the student often feels insecure because of the lack of the teacher's presence and a clear assessment of his or her success or failure due to the lack of feedback from the teacher and, most often, other students. This uncertainty of children increases because they do not fully understand the structure and logic of some courses (Salgarayeva and Sabit, 2016).

The proper organization of training makes it possible to prevent the overload and fatigue of students, and helps them to realize the importance of maintaining health. Modern educational technologies contribute to the formation of students' cognitive activities, which plays a crucial role in the methodological support and the effectiveness of education as a whole (Belopolskaya, 1999; Shevchenko and Triger, 2004, 2005).

The problem of teaching children with disabilities becomes urgent due to a significant increase in the number of this group in society on the one hand, and the emerging opportunities for their adaptation, on the other hand. As a social group, children with disabilities need, mainly, real conditions for obtaining quality education, starting from school, and receiving vocational education with subsequent employment and adaptation in society. In a social state, the right to a decent life and free development is guaranteed to everyone, regardless of their ability to work or to participate in socially important work.

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