Use of distance technologies in education of pupils with disabilities

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Abstract. The article is devoted to the consideration of the problem of using distance educational technologies in the educational process of a comprehensive school for pupils with disabilities in the context of modern educational practice. Education is the basis and resource for creating ideas about the values of the world and a human among schoolchildren, therefore, the development and use of pedagogical technologies, the formation of value knowledge and attitudes towards the world, and the involvement of schoolchildren in value-semantic activities are necessary in the conditions of modern inclusive education. The methodological approaches to the organization and implementation of the educational process using distance technologies in a general education school for children with disabilities are described. Significant results are shown and deficiencies in the use of distance learning technologies in the educational process of a comprehensive school for children with disabilities are indicated.

1. Introduction
Currently, in modern Russian education, one of the main goals of state policy is to develop the idea of the uniqueness of each person. The Concept for the modernization of Russian education, the Federal State Educational Standard for students with disabilities, says that it is necessary to create an educational environment and educational space that would provide quality education and socialization of all students, regardless of their mental and physical condition and development.

The requirements of modern reality, presented to the theory and practice of education, make the problem of finding the most effective methods and techniques for the education of children with disabilities, ways to improve the organization, content and technologies of their education and upbringing urgent.

In this regard, the problem of using distance educational technologies in the educational process of a general education school for children with disabilities in the context of modern educational practice is relevant.

The theoretical aspect of this problem lies in the analysis of three contradictions between:

- the need to find out the theoretical conditions for improving the quality of education of children with special educational needs, and the lack of theoretically elaborated characteristics and conditions for its formation;
the emergence of regulatory requirements to ensure the rights of children with special educational needs to receive education in general education schools, and the lack of a prepared educational environment on the part of peers, parents and teachers;

research on the relationship of children with normative development and with special educational needs, and the lack of development of a unified pedagogical model for the formation of effective tolerant relationships.

These contradictions made it possible to formulate a practical and theoretical research problem, which consists in the need to obtain reliable scientific information on the use of distance learning technologies in the educational process of a comprehensive school for children with disabilities in the context of modern educational practice.

2. Materials and methods

The methodological basis of the study was:

- works of scientists on the essence, content of distance learning (L K Averchenko [1], P R Egorov [2], I M Ibragimov [3], S V Matsievsky [4], I A Nagaeva [5], G N Fadeev [6], J Arthur & D Carr [7], M Felisa Verdejo, A Stefano [8], etc.);
- scientific works highlighting the possibilities of using methods, means, distance educational technologies in the organization of training and education of schoolchildren of different age groups (S G Abdullaev [9], I I Bobrova [10], P A Kislyakov [11], A S Olnev [12], S V Selmennev [13], W Sanderse [14] and others);
- psychological and pedagogical research on the organization of training and education of schoolchildren of different age groups (T N Zyuzina [15], L N Rainkina [16], L I Raush [17], Sh M Samari [18], Yu E Tikhomirova [19], M K Topunova [20] and others);
- ideas of integration and inclusion in modern education (G I Chizhakova, I V Duda [21], M A Choshanov [22] and others).

For our research, a pedagogical approach is important, within which, as noted by V.G. Domracheev, A. Baghdasaryan, distance education is presented as “... a new stage of distance learning, which provides the use of information technologies based on the use of personal computers, video equipment, audio equipment, space and fibre-optic technology [23]”.

E S Polat emphasizes that “distance learning is an educational process organized according to certain topics, academic disciplines, which provides for an active exchange of information between students and the teacher, as well as between the students themselves, and using to the maximum extent modern means of new information technologies (audio-visual means, personal computers, means of telecommunications) [24]”.

Distance learning allows a student to master educational material at his own pace, based on educational needs and personal capabilities. For schoolchildren with disabilities, such training builds an individual route based on differentiation and individualization.

A distinctive feature of distance learning is the provision of students to use the developed information resources provided by modern information technologies [25, 26]. Information resources: databases and knowledge, computer, including multimedia, training and monitoring systems, video and audio recordings, electronic libraries - together with traditional textbooks and teaching aids create a unique distributed learning environment.

Based on the specifics of the educational organization, the characteristics of students in the educational process, distance learning technology is used, which is a combination of methods and tools for teaching and administering educational procedures, ensures the educational process at a remote distance based on the use of modern information and telecommunication technologies.

In 2014, by the decision of the Government of the Krasnoyarsk Territory, the regional budgetary educational institution "School of Distance Education" was created. The educational process is
organized through the interaction of a student and a teacher through the Skype program. Since September 1, 2014, the School has been implementing the project “Teaching children in hard-to-reach and small schools with long-term teaching vacancies”. During the implementation of the project, the teachers at the School, within the framework of network interaction, organize the learning process using distance technologies for students at schools that have vacancies for teachers in compulsory subjects of the curriculum. So, to date, training has been organized for 28 schools with long-term teaching vacancies, from 19 districts of the Krasnoyarsk Territory, in 11 subjects.

Since 01.09.2015, the School of Distance Education is one of the pilot schools for testing the implementation of Federal State Educational Standards for students with disabilities with musculoskeletal disorders. From 01.10.2015, a learning process was organized for children undergoing long-term treatment, using distance technologies, in the Krasnoyarsk Regional Clinical Centre for Maternal and Child Health, from 11.01.2016, in accordance with the Procedure, the School organized a learning process using distance technologies for children undergoing rehabilitation at the Beryozka Children's Rheumatology Sanatorium (Kansk).

For the high-quality implementation of distance technologies in the educational process, we use the following teaching aids:

As part of the experiment, the teachers of the School developed lessons and courses on curriculum subjects in the virtual learning environment Moodle, which is a free web application that makes it possible to create separate online courses and educational websites. Moodle is a free learning management system focused primarily on organizing interaction between teacher and students, suitable for organizing distance learning courses and supporting face-to-face learning. Within educational institutions, Moodle makes it possible to create and manage various training courses.

The specifics and advantages of the Moodle system used in teaching children with disabilities are as follows:

1. Using Moodle, a teacher can create training courses, filling them with content in the form of audio and video files, texts, diagrams, tables, graphs, photographs (pictures), presentations, questionnaires, tests, links to on-line dictionaries, e-books, textbooks, websites on the topic of the lesson or section, etc., which, in turn, makes it possible to implement the principle of visualization of teaching. In this case, the advantage of including video materials in the content of the lessons is that it gives the teacher ample opportunities to show the child what he could not observe in life due to motor limitations (for example, “Excursion through the autumn forest”, “Travel to the capital of our Motherland”, etc.).

2. In this learning environment, you can import and export text files, which, in turn, gives the teacher additional opportunities to expand the educational material on the topic of the lesson, and the student - the ability to provide the results of completed assignments (home, test work), which can be issued in text form (since many students, due to the leading disease, do not have access to such a form of work as writing).

3. This system has an accessible and understandable interface for both the teacher (when creating a training course and accompanying it) and for students (when they master the material on the topic of the lesson, perform the proposed tasks, tests, control, verification work, experiments, etc.).

4. Regardless of the fact that the educational interaction between the teacher and the student is carried out using the Skype program, in this educational environment there is the possibility of communication between the teacher and the student during extracurricular hours through separate tools of this system, such as chat, forum, Wiki, exchange of personal messages, mailings by e-mail; with the help of these tools, there is also an opportunity for students of the same class to communicate with each other both outside of school hours and in the process of group work (research, project).

5. The Moodle environment for a particular subject may contain all theoretical, practical and diagnostic material, including textual information, multilevel tasks, questions, various options for control and test work. All this saves time during the lesson, since many students, without the help of their parents, cannot open the textbook on the desired page due to the low level of fine motor development. But with the help of specialized equipment, children can easily control the course being studied.
6. The developed training courses can be used not only by the developer himself, but also by other teachers teaching this or that subject. This enables specialists to expand the range of using didactic and visual materials in the classroom.

7. Since the leading form of knowledge control in children with musculoskeletal disorders is testing (due to an insufficient level of development of subject-manipulative activity), Moodle has an extensive toolkit for creating tests, as well as conducting educational and control testing. The system under consideration supports several types of questions in test items (multiple choice, matching, true / false, short answers that the child is able to type, but not write, essays, etc.).

8. Based on the results of the students completing assignments or tests, the teacher can give marks and give comments, which each student can get acquainted with at a convenient time for him.

9. At the beginning of any lesson, as well as after school hours, each student has the opportunity to recall and repeat the material covered by going to the appropriate lesson in the learning environment.

Thus, Moodle is a platform for creating educational material and supporting interactive interaction between the subjects of the educational process. This system provides the teacher with a wide range of tools for presenting educational and methodological materials of the course, conducting theoretical and practical classes, organizing the educational activities of schoolchildren, both individual and group.

In addition to the Moodle learning environment at SDE, teachers use video lessons in the process of teaching children. This is mainly due to the specifics of the educational institution's curriculum. The study of the topics of some subjects (for example, the surrounding world, literary reading, fine arts) is carried out in two modes: on-line (in class) and independently. In accordance with this, for a deeper understanding and assimilation of the educational material allocated for independent study, students are invited to watch a particular video lesson that reveals a certain topic, as well as complete assignments and answer questions that are included in the content of the recorded lesson.

Such mastering of the program material is the more effective than acquaintance with it only with the help of a textbook, since:

1) in addition to visual perception of information (viewing the proposed illustrations, photographs, demonstrated experiments, etc.), the child has the opportunity to hear relevant comments and explanations from the teacher-lecturer (leading the lesson). This, in turn, employs a larger number of modalities of information perception in the student;

2) if the child does not understand the explanation of any material, he has the opportunity to listen to the explanations again, finding the right moment in the lesson recording;

3) such mastering of educational material increases educational motivation (since this is a non-standard form of acquiring knowledge for children) and improves the skills of independent work;

4) forms computer literacy and information culture;

5) helps prepare students to use a wide range of information technologies and other information structures in the process of gaining knowledge.

Since students often have limitations on the motor activity of their hands, the question arises about the use of additional resources that allow them to record text, create drawings online. For this, in particular, the online service Twiddla is used. It is intended / used for student and teacher to work together.

Twiddla allows you to jointly and simultaneously place text on the working surface (size, style of letters, align text, highlight it in bold, italics), illustrations, mathematical formulas; embed documents, widgets and html-code.

There is the possibility of joint web browsing online. Allows you to communicate using chat and sound.

In fine arts lessons, in order to develop the creative experience of students, master the figurative language of decorative arts, the Sumopaint program is used. The program allows students to create both sketches and ready-made drawings, and colour ready-made contours, allows you to work with ready-made templates, geometric shapes as a basis for creating a drawing.
The program is very convenient and accessible for school students, it can become a motivating factor for the manifestation of creativity. For students with impaired motor skills, it simulates traditional art materials for drawing, allowing them to more fully display their ideas and ideas in drawings.

In connection with the introduction of new information technologies in the education process, new types of excursions have emerged - virtual excursions.

A virtual tour has an advantage: without leaving home, you can visit and get acquainted with cultural sites (museums, theatres, etc.) located in different parts of the world.

The virtual tour is characterized by interactivity, that is, the student's ability to act independently in the created space of the visited object. By controlling the cursor, the student can zoom in on various objects, rotate around an axis, tilt or lift his eyes, and the picture on the screen changes in accordance with his actions.

The use of virtual excursions allows for fascinating, informative, memorable lessons. The works of art of many art museums, for example, the Tretyakov Gallery, are shot in very high resolution, which allows you to see the paintings in the smallest detail: you can see the faintest and most imperceptible brush strokes of the artist, you can really see even the smallest cracks in the canvas.

The ArtRage program has all the necessary qualities for drawing on a computer. The program is used in fine arts lessons and in continuing education courses (Computer Brush). The program qualitatively simulates drawing with a brush, pencil and other tools of a real artist. The developers have tried to make the drawing process convenient, simple and of high quality. The program has special settings that allow you to paint with paints that dry on a virtual canvas. This will allow you to mix paints to get the colours you want, and also to smudge making beautiful landscapes. The process of mixing and smearing itself is as close to real as possible.

Features of the program:

- it has only artistic instruments;
- it supports tablets, angle, pressure;
- you can put a sample and draw on it with paints;
- the scale, transparency of layers and operations on them can be set;
- it has metallized paint (included under the colour palette);
- as a palette, it has a large selection of built-in;
- is liked by children, and easily mastered by them;
- it has intuitive and lightweight interface.

The use of ArtRage by children in the visual arts and in continuing education courses allows them to create a picture that looks like it was created in an art studio, and not on a computer. The simple design of the program and uncomplicated technical use allows the child to show everything that he sees and how he understands it using the ArtRage program. For students, this program is convenient because they can select ready-made fragments, various elements and drawings, and use them in their work. They also learn to use and recognize hidden possibilities and create works of semi-computer art. The fact that students cannot depict on their own due to physiological characteristics, in this case, the ArtRage program helps them a lot with this.

The GarageBand program is used in music lessons and in extracurricular activities with the aim of forming a system of knowledge, skills, skills of students with disabilities in the field of music and musical composition, as well as realizing the creative abilities of students, improvisation.

The program allows students to independently make audio recordings and audio editing. In music lessons, the program creates musical and poetic compositions.

The Garage Band Music Laboratory program is a real world of musical experiments. The program allows the child to feel like a real sound engineer. Students learn to create music, process ready-made melodies, compose, make voice acting for films, slideshows, create musical and poetic compositions (independently record their own voice and create musical accompaniment). Processed musical compositions are actively used at extracurricular activities.
The program is very convenient and accessible for students with disabilities of the musculoskeletal system, its use helps to reveal the creative potential and broaden the horizons of students in the field of musical composition. Due to physiological characteristics, students cannot play various musical instruments, and the GarageBand software allows them to feel like real musicians.

3. Conclusion

Thus, we can say that using these remote technologies, it is possible to effectively carry out the educational process with students with disabilities. For people with disabilities (especially for children with musculoskeletal disorders), education using distance technologies is an effective way to gain full knowledge and, in the future, have the opportunity to professionally self-actualize.

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