MODERN CHALLENGES IN TEACHING DIGITAL LITERACY TO PRIMARY SCHOOLCHILDREN IN THE CONTEXT OF INCLUSIVE EDUCATION

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Abstract- The article is aimed at identifying the current state of inclusive education in primary school. Based on international experience and internal research, not only the main problems of implementing inclusive education are identified, but ways to solve this problem are proposed. Based on the analysis of existing approaches, some methods for developing inclusive learning have been identified. Using a survey and questionnaire, some views of parents and teachers were identified. The main documents of the Republic of Kazakhstan were also analyzed in order to identify the positive but also negative aspects of this area of educating children with some limitations. Based on an analysis of existing approaches, requirements have been identified for the creation of special educational and methodological materials for the course "Digital Literacy" in a junior school of inclusive education to develop their potential capabilities.

Keywords - Inclusive Education, Children With Special Educational Needs, Primary School Education, Teaching Materials, Digital Literacy.

I. INTRODUCTION

Currently, much attention from the state, parents and teachers is paid to improving the level of education of persons with special educational needs (SEN). We are talking not only about physical, but also mental deviation from the average, generally accepted state of health of children in the direction of reducing their abilities.

It is important to ensure equal access for children with special education needs to quality education in educational institutions, on an equal basis with other students, i.e. in inclusive education, as well as in inclusive distance education. Currently, this is an urgent problem and there is a lot of research in this area both abroad and in Kazakhstan. With the development of digital technologies, the subject "Digital Literacy" was introduced, which brings with it a new challenge in the approaches and methods of inclusive education in the field of information and communication technologies (ICT) and the use of ICT to improve the quality of education, starting from the first grade of primary school.

The subject has become an integral part of the primary school curriculum, providing children with the opportunity to learn important skills for the modern world. Based on the analysis of inclusive education, we can say that there are the following pressing problems that arise when using existing methodological developments in the course "Digital Literacy" for junior school of inclusive education:

- Often Digital Educational Resources Are Not Suitable For Use By Students With Special Educational Needs;
- During Training, The Individual Typological Characteristics Of Children With Special Education Disabilities Are Not Taken Into Account;
- Inclusive Education Is Not Sufficiently Focused On Creating Conditions Under Which Every Child Can Develop Their Skills And Abilities In The Digital Environment; Not All Teachers Use Digital Technologies In Teaching;
- There Is A Lack Of Research On Specific Methods And Strategies For Teaching Digital Literacy In Inclusive Conditions;
- The Capabilities Of Digital Technologies In Existing Digital Educational Resources Are Not Fully Used To Help With The Individual Typological Characteristics Of Children With Special Education Needs.

The purpose of this study is to analyze existing approaches to teaching in order to identify current problems arising from existing methodological developments for the course "Digital Literacy" for a junior school of inclusive education and, on their basis, to determine the requirements for creating special educational and methodological materials for this course, taking into account the potential capabilities of children of the following categories: persons with hearing impairments; persons with mental retardation; persons with musculoskeletal disorders; persons with severe speech impairments.

II. DETAILS EXPERIMENTAL

2.1. Materials and Procedures

In this section, an analysis of the literature on existing approaches to inclusive education allows to understand current trends and best practices in this area, both in foreign and domestic research. Next, we will consider the key aspects of this analysis, paying attention to some of the most significant works and methodologies.

A study by a German scientist [1] noted that "Digital Innovation" helps prepare students of all ages with special needs (disabled people, migrants, people from poor families) to master competencies that will allow them to further integrate into society. Article [2] discusses methods of teaching computer science in the context of inclusive education. Paper [3] discusses the ongoing modernization of the education system in Russia, with special attention to the education of persons with disabilities. And also three main stages of lesson construction are considered: organizational and preparatory, main and final. The author [4] proposes a methodology for differentiated learning. According to an Italian scientist from the University of Bergamo, the discourse of fairy tales enriches children's lives with their imagination and helps them express their emotions, recognize their difficulties and find solutions to problems [5]. Work [6] discusses the concept of universal design of educational materials and teaching methods for all students. The concept of electronic inclusion in school education is also considered. The work [7] considers a dual perspective, affecting both the availability of educational tools and the development of new competencies among teachers. This highlights the importance of ensuring that essential educational tools, including those based on ICT, are barrier-free and accessible to all students.

In Kazakhstan, there are also a number of scientific researchers working on this topic [8, 9, 10, 11, 12, 13, 14, 15]. The study's findings may have important practical implications for educational institutions seeking to make learning more accessible and inclusive for all students. The works emphasize the importance of developing self-esteem skills in students with mental retardation to ensure their successful integration into the educational system. Key methods and strategies used in the national context are analyzed. It is recommended to use a gaming form of technology in the context of innovative and inclusive education for primary school students.

Based on the research work carried out and the analysis of a large number of works in this area, as well as recommendations for organizing work with children with special needs[16], determinedclassification of SENin Fig.1.

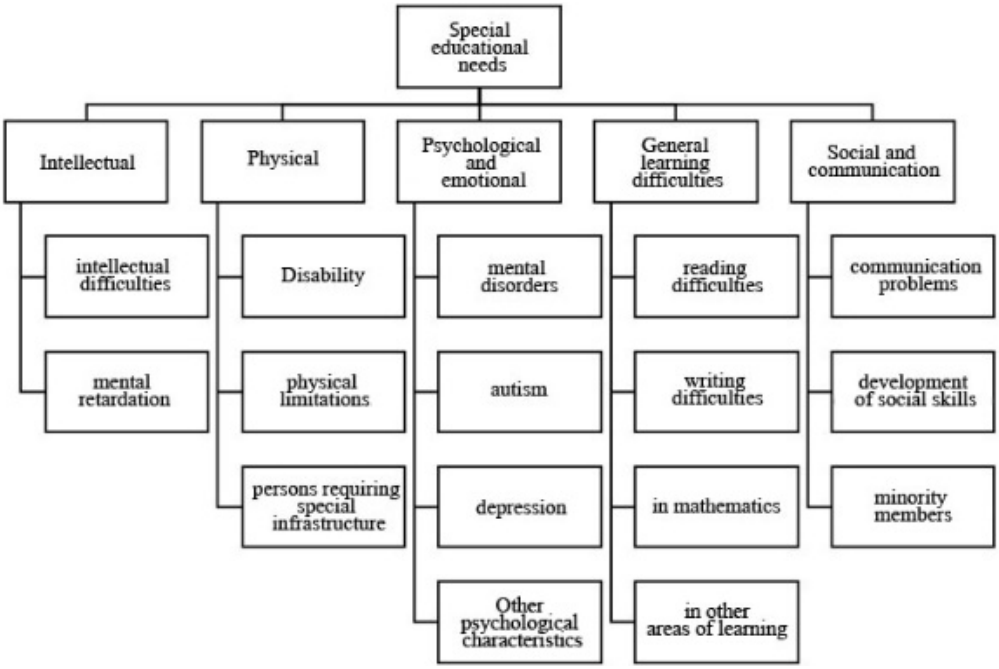

Fig.1. Classification of special educational needs

More in-depth research is required to advance this field more effectively. To solve this problem, further research and development of specialized methods for teaching digital literacy in inclusive classrooms is necessary.

III. RESULTS AND DISCUSSION

3.1. Questionnaire of teachers and parents

To obtain reliable results, a questionnaire, survey, conversation, and video conference with teachers and

parents of children in primary schools of inclusive education in the Republic of Kazakhstan were carried out [17,18], which, based on the questions asked, made it possible to study this issue in more detail. 105 teachers and 80 parents participated in the studyin Fig 2, 3. The results of the study showed that the main problems of teaching inclusive education to junior schoolchildren are:

- Lack Of Ready-Made Digital Educational Resources In The Educational Process For Children With Special Education Needs;
- Lack Of Adaptation Of The Digital Literacy Curriculum To The Characteristics Of Children;
- Dissatisfaction With The Existing Conditions Of Teaching Children With Special Education Needs;
- Lack Of Special Textbooks And Notebooks For Children With Special Needs Education.

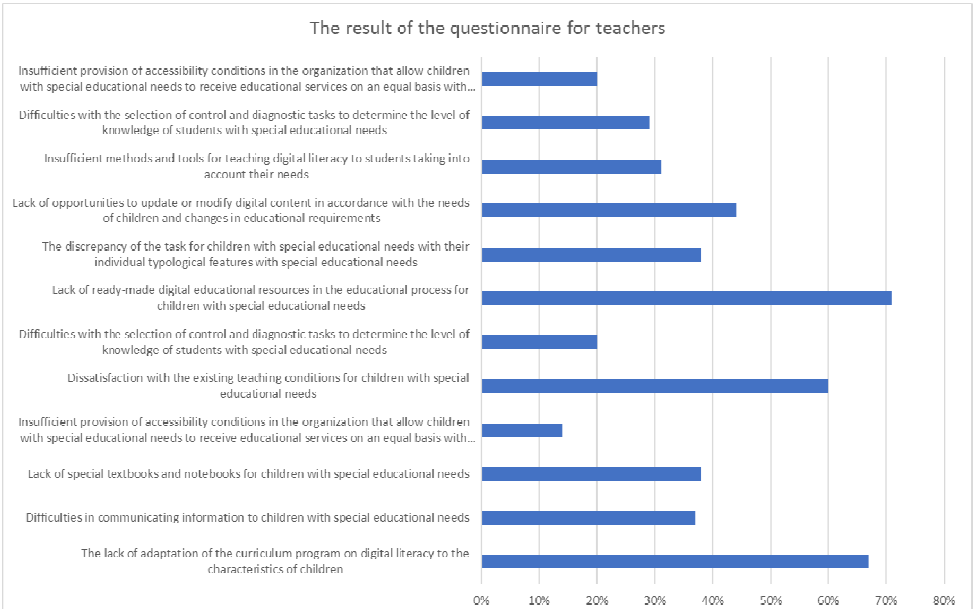

Fig.2. Results of the survey of teachers, (%)

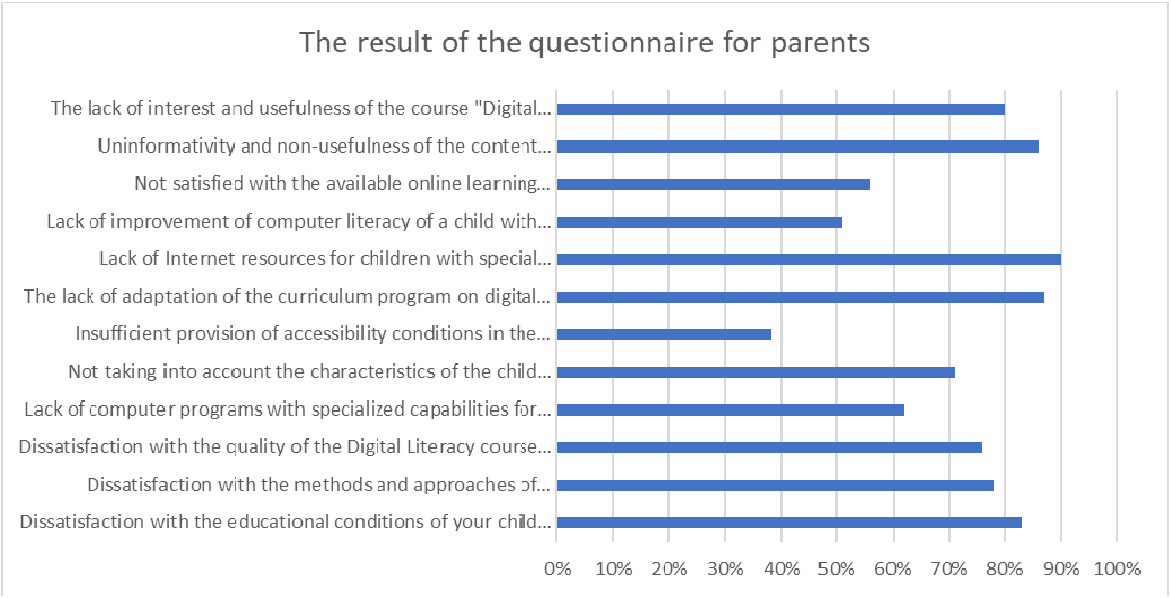

Fig.3. Results of parents' questionnaire, (%)

During a survey and conversation with teachers, parents, and students, it was determined that the following cognitive and didactic risks may arise when using special educational materials, namely: when perceiving educational material through digital technologies, the main risks are the lack of an individual approach; increased emotional stress on the child; difficulties in students perceiving a child with a disability as their equal; lack of professionally

and psychologically trained teachers and specialists as a risk factor.

3.2. Requirements for creating special educational and methodological materials for the course "Digital Literacy"

Based on the research work carried out and the analysis of a large number of works in this area, as well as recommendations for organizing work with children with special needs [16], requirements have been identified for the creation of special educational and methodological materials for the course "Digital Literacy" in a junior school of inclusive education for the development of the potential capabilities of children of the following categories (persons with hearing impairments, persons with mental retardation, persons with musculoskeletal disorders, persons with severe speech impairments):

- Adaptation to the target audience: taking into account the age and level of knowledge, needs and specific requirements of students with special education needs;
- The goals and objectives of the "Digital Literacy" course must be achieved through the use of educational and methodological materials, taking into account the potential capabilities of children with special education needs, in accordance with the educational standard;
- Structure and logical organization: division into sections and lessons, including a table of contents and navigation for the convenience of children with special education needs;
- Visual design: materials, illustrations, diagrams and other visual aids must be readable for all categories of children with special needs, and design principles for such children must be followed;
- Interactivity and practice: include interactive elements, tasks for independent practice and problems to be solved;
- Variety of content: variety of content formats (text, video, audio, interactive modules, cases and examples, etc.), attract speakers, sign language interpreters, psychologists for media content;
- Support and additional resources: dictionaries, reference books, recommendations for further study and support;
- Assessment and feedback from students to teacher and vice versa.

We also recommend in Table 1 the requirements for digital content of materials for children with special needs.

Psychological characteristics	Educational and methodological material
Children with mental retardation (MR)	
Children with mental retardation are characterized by: - insufficient general knowledge and limited ideas; - immaturity of thinking and a predominance of gaming interests; - a low level of performance and rapid fatigue during intellectual stress; - a slow involvement in work; - inadequacy of ways out of conflict situations.	For children with mental retardation the following is necessary to be developed: - digital content (DC), which can be viewed at any time; - add game elements; - add short films; -use the functions of slowing down the work of the DC; - add the ability to regulate the playback speed of an audio file; - use materials in distance learning and self-study.
Children with speech impairments	
Children with severe speech impairments are characterized by: - poor supply of information about the surrounding world; - in children the concrete-figurative type of thinking predominates, the ability for speech abstractions is poorly expressed; - delayed formation of concepts about the shape and size of objects; - slow formation of counting operations; - inability to retell what has been read.	For children with severe speech impairments the following is necessary: - to stimulate the imagination and to help them express their emotions, use the discourse of fairy tales when explaining the material; - use elements of augmented reality; - add a calculator assistant; - add interactive tasks: tests, quizzes, so that children do not have difficulty retelling the material they have studied; - use sound signals to switch attention; - use the application to correctly pronounce the text; - increased microphone sensitivity.

Children with hearing impairments	
There are two categories of children with hearing impairment: complete hearing impairment; partial hearing impairment. Children of the second category are characterized by: - pronunciation deficiencies ("blurred" speech, mixing of voiced and unvoiced sounds, replacement of many sounds with [t]); - limited vocabulary; - inaccurate understanding and incorrect use of words; - deficiencies in the grammatical structure of speech; - limited understanding of spoken language; - limited understanding of the text being read.	For children with hearing impairments the following is necessary to use: - assistance of a sign language interpreter to cover material in sign language; - a separate application or monitor for simultaneous translation; - audio-to-text translator; - asking questions more frequently to repeat a task; - it is useful to control the student more often in different forms: "Repeat what I said; continue", etc.; - use video materials with gestures.
Children with musculoskeletal disorders	
Features of the mental development of children with cerebral palsy are associated with damage to the motor sphere: - severe movement disorders; problems with computer control and information input; - mild and moderate movement disorders; - speech disorders; - Hearing loss is often observed. This leads to difficulties in learning to write and read; - spatial orientation is impaired. This is manifested in the slow formation of concepts that determine the position of objects and parts of one's own body in space; - inability to recognize and reproduce geometric shapes, to put parts together into a whole; - while writing, errors are detected in the graphic representation of letters and numbers (asymmetry, specularity); -children cannot follow the lines in the notebook, distinguish between its right and left sides, they can start writing or drawing anywhere in the notebook or album, or read from the middle of the page.	For children with musculoskeletal disorders, the following is necessary to be provides: - reducing the speed of cursor movement (if fine motor skills are impaired); - increasing the size of the cursor (if fine motor skills are impaired); - sticky keys (in case of severe impairment of fine motor skills); - disabling auto-repeat (in case of severe impairment of fine motor skills); - display of a virtual keyboard (in case of severe impairment of fine motor skills); - reducing the double-click speed (in case of severe impairment of fine motor skills); - increasing the viewing area (if tracking is disrupted).

Table1: Requirements for special educational materials using digital technologies

IV. CONCLUSIONS

This article analyzes existing approaches to teaching in order to identify current problems that arise when using existing methodological developments in the course "Digital Literacy" for junior school of inclusive education. Psychological and pedagogical literature was used, the results of a questionnaire, survey, conversation, video conference with teachers, school students and parents of children with special needs were obtained, cognitive and didactic risks were taken into account. The results of the study showed that the main problems in teaching junior schoolchildren in inclusive education are: the lack of ready-made digital educational resources in the educational process for children with special education needs; lack of adaptation of the digital literacy curriculum to the characteristics of children; dissatisfaction with the existing conditions of teaching children with special needs; lack of special textbooks and notebooks for children with special needs. Based on the analysis, requirements were identified for the creation of special educational and methodological materials for the course "Digital Literacy" in a junior school of inclusive education for the development of children's potential.

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