

Application of information technologies for the development of communication skills

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Abstract. The goals of modern preschool education imply the creation of conditions for promoting the development of the child's personality, including his communication skills. Their lack of development creates barriers in the process of relationships between preschoolers with peers and adults, and can also lead to problems of self-development, social maladjustment and personal isolation. In children with disabilities, persistent violations of all components of the communication process are observed, which manifest themselves in a decrease in the communicative and cognitive need for interaction with peers and adults. They acquire many skills, including communication, much later, compared to a normally developing peer. In this regard, the need for purposeful development of communication skills in preschoolers with disabilities is becoming increasingly clear. The research methods used were "Observation of the manifestations of communicative abilities in preschoolers" (A.M. Shchetinina, M. A. Nikiforova), the sociometric method "Two Houses" (T. D. Marcinkovskaya), "Diagnostics of the child's communicative abilities "Plot pictures" (N. E. Verax), "Plot pictures" (R. R. Kalinina), "Observation of the manifestation of independence" (A.M. Shchetinina). The data was processed using the Statistica 6.0 software package and the Mann–Whitney U-test and Wilcoxon signed-rank test. Based on the data obtained, it can be concluded that the hypotheses that children of older preschool age with disabilities who attend a group of combined orientation have disorders in the development of communication skills, as well as a correctional and developmental program based on the method of fairy-tale therapy, can overcome the existing communication disorders in preschoolers with disabilities. As evidenced by the results obtained using the methods of mathematical statistics.

1 Introduction

Currently, the use of digital technologies in preschool education is becoming more and more relevant, and opens up new opportunities. The need to introduce such practices in the educational process is reflected in Russian legislative acts. Practice shows [1] that the use of information technologies is possible from infancy. These include applications for smartphones, addressed to the age of 0 to 3 years and their use by parents as a universal assistant in the development of the child.

In the modern world of the iGen (internet generation) generation, there are different

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opinions about the impact of the use of digital technologies on the cognitive and emotional development of a child. Similar experience of applying digitalization in education is described in the studies of foreign and domestic specialists.

In our opinion, games are of the greatest interest among preschool children [2]. At the same time, such digital games can not be attributed to traditional ones, and the digital device is only a "device" [3] between the player and the game. The lack of live communication during these games can negatively affect the development of communication skills of preschoolers. In the future, for school-age children, the computer may become a means of obtaining sensory impressions, rather than a source of information [4]. Uncontrolled use of digital resources in the practice of preschoolers can lead to a decrease in the level of cognitive activity, self-development, a decrease in the level of attention, and more.

According to researchers from Turkey [5], games on the platform are an integral part of the physical, speech, emotional and social development of the child and are effectively used in the education of both normally developing children and children with developmental disabilities.

A comparative evaluation of the effectiveness (Manuel Peralbo-Uzquiano, Raquel Fernández-Abella, and others) [6] of the use of the digital learning format in normally developing preschoolers, in order to improve attention, control, and the study of mathematical foundations in preschool education, compared with traditional learning, showed the same results. However, the use of digital resources significantly reduced the time allotted for classes.

Many researchers in the field of education of children with disabilities they also note the positive effect of the use of digital resources in the lives of preschoolers [7].

Researchers from Hong Kong (Wing-Chee So, Chun-Ho Cheng, Wan-Yi Lam, and others) [8] noted significant improvements in the verbal and nonverbal means of communication of children with autism spectrum disorder (hereinafter referred to as ASD), after the use of role-playing and theatrical games with the inclusion of robot therapy.

The practice of using educational software as an auxiliary technology for children with ASD was also evaluated by teachers from Indonesia (Yudy Purnama, Faiz Ahmadhio Herman, and others) [9]. The educational application Squizzy, based on the Scrum methodology, made it possible to facilitate the learning process, both for teachers and parents of children with similar disabilities. In addition, the program has improved the indicators of cognitive development.

Specialists Katharine Still, Ruth Anne Rehfeldt [10] in their work confirm the effectiveness of using applications on a smartphone as alternative augmentative communications (hereinafter AAC) for people with ASD.

Ph. D. s Allison L. Wainer, Brooke R. Ingersoll [11] present a review that presents research on the positive impact of interactive computer programs on the social and communication skills of people with ASD. French scientists (Cécile Mazon, Charles Fage and others) [12] have shown the effective influence of various technological devices (computer, phone, robot, tablet, etc.) in the educational process of children with ASD.

Use of information and communication technologies (hereinafter referred to as ICT) (Athanasios Drigas, Kokkalia Miltiadis D. Lytras) [13] in preschool children with reduced memory capacity, showed effectiveness in the process of studying the mathematical foundations and literature. The effectiveness of the use of ICT in pre-school children was also confirmed by scientists from Greece and China (Xia Liu, Eugenia I, and others) [14], who analyzed the results of the use of these technologies in preschool institutions. The analytical assessment was carried out in three areas: the availability of ICT in an educational institution, the impact on preschool children and the impact on teachers.

American studies (Jareen Meinzen-Derr, Rose M. Sheldon, and others) [15] in the

development of speech skills in children with hearing impairment through the use of basic verbal strategies of AAC with the use of an iPad, have shown significant improvements, expressed in increasing vocabulary, improving the lexical side of speech, and more.

A number of experts from Spain (Ana Manzano León, Cesar Bernal Bravo, and others) [16] also confirm the positive impact of using Android and iOS apps on improving reading and writing skills in children with dyslexia. However, they note the need to use them as an additional, rather than the main, educational resource.

Of particular interest is the study of the impact of sensory devices on children with visual impairment. In the traditional sense, such devices have a negative impact on the safety of vision. However, the results of a pilot study by Czech specialists (Kamila Ržičková Tereza Hordějčuková) [17] show the development of visual and other skills in children with visual impairments when using the iPad touch screen and the Czech application EDA Play.

It is important to note that information technologies are used not only in the educational process of normally developing children and those with developmental disabilities. Computer games have a special diagnostic value, providing an objective, motivating and safe way to assess a child's development [18].

The use of digital technologies on the 2D (two-dimensional graphics) platform, adapted for children with motor disorders of different degrees of severity, made it possible to study the level of development of such preschoolers when entering school. Such digital technologies have been evaluated by both experts and educators in Brazil (Marcia Aparecida Silva Bissaco, Annie France Frere) [19]. In addition, the subjects did not have any difficulties and fatigue when passing computer tests. All this makes it possible not only to adequately assess a child with motor disorders, but also to develop an effective training program.

In children with developmental disabilities that differ in executive dis-function, various applications allow parents and teachers to monitor the performance of daily classes [20].

Russian specialists V. R. Kuchma, M. I. Stepanova, and M. A. Polenova [21], among various information technologies, distinguish the use of audio and visual materials as means of increasing the perception of learning information.

In addition to the research and observations of practitioners in the field of education, the positive impact of digital technologies is also confirmed by the Russian medical community. In particular, the staff of the "Scientific Center for Children's Health" noted the fruitful impact of the rational use of tablets on the mental activity, psychoemotional state and performance of preschoolers [22].

In our opinion, information technologies in preschool education, with the rational use and assistance of a teacher and parents, can perform the following functions:

1. Cognitive-the desire to learn new things;
2. Training – the implementation of training programs contributes to the development of the individual;
3. Developing-working on a computer can contribute to the development of fine motor skills, independence, perseverance, creativity, and others;
4. Communicative - working in groups and using network technologies teaches you to communicate and work in a team, promotes the development of communicative and cultural functions;
5. Educational – performing tasks of a teacher, disciplining children;
6. Prestigious-the possession of computer technologies can influence the improvement of the status of a preschooler in the team;
7. Prognostic-preparing a child for life in the information age.

Thus, at present, information technologies should be considered as a means of improving the efficiency and quality of pre-school education. At the same time, their use

should not replace the teacher and (or) the parent, but only complement them (him). It is not advisable to include digital technologies in every training or development session.

One of the most effective methods of correcting communication skills, with the possible introduction of information technologies, we consider the method of fairy-tale therapy [23].

The development of interaction between children through fairy tales has a positive effect on the development of communication skills. Preschool children are liberated, show a greater interest in completing tasks, and become more open in the perception of reality. After the course of the lesson (at least three months) in children, motor activity, fears and anxiety decrease, the speech state improves, and the emotional state normalizes. In addition, teachers note that children who, due to their violation, can not immediately join the game, using the techniques of fairy-tale therapy, still experience a favorable influence on the subconscious level.

Experts in age psychology are of the opinion that the method of fairy-tale therapy can be used for children of any age. However, it should be noted that preschool children have a highly developed identification mechanism, that is, the process of emotionally uniting themselves with another person, a character. Therefore, children are more receptive to the "fairy-tale laws" and with the help of a fairy tale, they better learn the norms and rules of behavior. Playing fairy tales (play, theater, production, cartoon therapy, etc.) expands the adaptive capabilities of the child's personality, reveals his inner potential and has a positive effect on the ability to act in critical situations. This method is also effective in forming a tolerant attitude towards children with disabilities.

At the present stage, psychological science has accumulated a lot of experience in using the method of fairy-tale therapy, but there is very little data on improving the effectiveness of this method through the use of information technologies. The above has determined the direction of the study. The purpose of this study was to theoretically substantiate and experimentally test the possibility of forming communication skills in children of older preschool age with disabilities by means of fairy-tale therapy. In accordance with the purpose, the following research hypotheses were formulated:

1. Children of senior preschool age with disabilities who attend a group of combined orientation have disorders in the development of communication skills.
2. If the developed correctional and developmental program is used on the basis of the method of fairy-tale therapy, it will help to overcome the existing communication disorders in preschoolers with disabilities.

2 Materials and methods

The assessment of communication skills of preschool children with disabilities was carried out in two preparatory groups of combined orientation on the basis of one of the schools in Moscow. The experiment covered 24 subjects: 13 people from the experimental group and 11 from the control group.

Preschool children have established diagnoses: speech disorders (general speech underdevelopment, motor and sensory alalia, dyslalia); mental retardation; ASD, Asperger's syndrome; disorders of the musculoskeletal system. Concomitant diagnoses: stuttering, strabismus, nervous tics, dysarthria, violation of praxis and other disorders.

In general, the following is noted for both groups: 80% of the total number of children have speech disorders, 38% - mental retardation, 38% - problems of the emotional and volitional sphere, 16% - motor disorders, and 12% - visual disorders. About 20% of the total number of children do not have an official diagnosis, but according to the results of the diagnosis of a teacher-psychologist, the level of psychophysical development of these children is below the norm.

At the time of the survey, the age of the subjects varied from 6 to 7 years. These groups

were formed at the beginning of the 2020-2021 academic year, which in turn also negatively affects the state of their communication skills.

To begin with, we selected the following psychodiagnostic methods: "Observation of the manifestations of communicative abilities in preschoolers" (A.M. Shchetinina, M. A. Nikiforova), sociometric method "Two Houses" (T. D. Marcinkovskaya), "Diagnosis of the child's communicative abilities "Plot pictures" (N. E. Verax), "Plot pictures" (R. R. Kalinina), "Observation of the manifestation of independence" (A.M. Shchetinina). The Mann-Whitney U-test was used to evaluate the differences between the two independent samples. The Wilcoxon signed-rank test was used to assess the differences between the two dependent samples.

3 Results

It was found that for most of the studied parameters (the child's ability to interact with adults and peers, using verbal and nonverbal means of communication; Understanding the state and actions of other people; Choosing appropriate ways of behavior in a particular situation), an extremely low level of communication skills is observed in both groups. Only the methodology aimed at assessing children's understanding of the tasks and requirements that adults impose on them was found to have a high level of development in both groups. This can be explained by the fact that frequent communication with seniors (educators, correctional specialists, medical professionals), which is promptly corrected by parents and (or) educators, has allowed us to form a relatively good theoretical understanding of the instructions coming from adults, but preschoolers with disabilities do not always apply them in practice. Statistical processing of the results obtained by the Mann-Whitney U-test showed insignificant differences, which indicates the same level of communication skills of preschool children with disabilities in both groups.

Based on the results of the preliminary assessment of communication skills, a correctional and developmental program "Hello, fairy tale" was created. In our educational work, we were guided by the fact that most of the classes conducted in kindergarten are aimed at developing cognitive activity, but children do not know each other, and preschool children do not have sufficiently developed communication skills. At the "Fairy Tale Week" held by the preschool institution, it was revealed that the vast majority of children do not know well-known fairy tales. Of the 13 children in one group, only one child was familiar with the fairy tale "Puss in Boots", two - "Little Red Riding Hood". At the same time, none of them could accurately tell the story, or answer "yes/no" to leading questions about the fairy tale. All this was the reason for the development of a special program. Fairy tales were selected for the classes: "Teremok" (develops the ability to listen to others and work in a team), "Baby Raccoon" (friendship and positive emotions), "Volshebnoeslovo" (polite words), "Big Uh" (protection of the weak, help) and others.

For a number of reasons, each class was held in two stages on different days. This was due to the presence of various disorders in children, rapid fatigue, the "novelty" of fairy tales for children, the time frame, the main goal of the program (development of communication skills), the use of information technologies, and other reasons.

The first stage was aimed at getting acquainted with the fairy tale, by watching a cartoon, or a filmstrip. Some of the cartoons were viewed using a computer, with the children sitting on chairs next to each other. With the other part of the cartoons/filmstrips/presentations, they were introduced with the help of a multimedia projector, by projecting on the ceiling (children were lying on the carpet). This device allows you to view videos, slides and listen to music, supports USB, SD cards. Since the use of the projector is only possible in the dark, the number of fairy tales viewed on the computer and the projector depended on the time of the lesson. Viewing on the projector

was organized in November-December 2020. Cartoons and filmstrips were used ready-made, no changes were made to them. The slides were created on a computer using the Microsoft Power Point program. Images for slides were scanned from the books of the "Multi-Tale" series published by Yabloko, with minimal text inclusion.

The first stage allowed to familiarize all children with each specific fairy tale, to understand the plot, to ask questions to the teacher-psychologist. Since this kindergarten had not previously used digital technologies, children were interested in such an innovation. And the opportunity to discuss what they saw with a teacher-psychologist, allowed them to win over children to fairy tales, taught them to listen to each other, not to be afraid to communicate with adults and ask them questions.

During the classes, a set of exercises for the eyes was conducted in verse, with musical accompaniment, for example: "Butterfly", "Bridge", "Wind" and others. The joint performance of these exercises not only relieved tension in the eyes, but also contributed to the unification of children, the development of their communicative abilities.

The second stage was aimed directly at achieving the main goal of the program – the development of communication skills. At this stage, the teacher-psychologist read the adapted version of the fairy tale, highlighting the main points that are the purpose of the lesson. For example, in the lesson "Tsvetik-Semitsvetik", the main essence of the fairy tale is aimed at the desire to help others, to reduce the child's fear of telling the truth to parents.

During the reading of the fairy tale, it was planned to hold various games, perform tasks for the development of communication skills. For better assimilation of the lesson material, during the game, musical accompaniment was included with the help of a phone, projector or CD player. In some classes, we used online coloring pages based on numbers on the planchet. For example, when reading the fairy tale "Little Red Riding Hood", the children all together painted a Little Red Riding Hood with a basket. Such joint work also had a positive impact on the development of communication skills, developed fine motor skills and introduced children to educational games (repeating numbers).

During the period of self-isolation associated with the coronavirus pandemic, almost all preschool institutions in the Russian Federation stopped working, and specialists (teachers-psychologists, speech pathologists, speech therapists) faced the need to carry out corrective measures using information technologies, in particular distance learning. Most of the teachers in Moscow were not ready for this. Urgent online training of specialists has reduced a number of problems in conducting remote classes. However, observations of the conduct of some group classes of specialists with children showed extremely low efficiency. Most of the children did not perceive the information on the screen, they interrupted each other, after a short time, interest in the lesson disappeared. One of the problems was the lack of understanding by parents of the need for their participation in distance learning of the child. It is important to understand that the remote education of a preschool child with disabilities requires greater involvement of the parent. The parent here can act as a tutor, guide the child, try to focus his attention on the teacher, try to teach him to listen and hear other children.

Taking into account that children in the group of combined orientation have various persistent disorders (including cerebral palsy, ASD), it can be concluded that some of these children will go to correctional schools. As an example, the State Educational Institution of the city of Moscow "School of "Technology of Education"" can be cited. This educational organization provides partially distance learning for children, regardless of quarantine measures.

All this led to an understanding of the need to include remote classes using Skype or Zoom in the program. In the framework of the program, these classes were conducted at the request of parents.

In addition, parents were invited to listen to evening skazok on Instagram, told by those who are members of the foundation "Commonwealth", including the author of the article, as part of the Christmas and New Year's marathon of fairy tales.

As a result of repeated diagnostics, we found that in the experimental group (Table.1) there is a noticeable increase in all the criteria of communication skills, namely: the level of empathy has increased, the level of conflict between children has decreased, verbal communication skills have improved, knowledge about the norms and values accepted in society has increased, and the level of independence has increased. In the control group, the least significant changes in the positive direction were observed, only for some components of communication skills.

Table 1. Indicators of The Wilcoxon signed-rank test in the experimental group

Methodology / Manifestations	Tempirical
"Observation of the manifestations of communication abilities in preschool children"	
Communicative qualities of the individual	
Empathy	8*
Benevolence	11*
Spontaneity	0*
Openness in communication	0*
Confrontation	0*
Initiative	5.5*
Communication actions and skills	
Organizational matters	0*
Perceptual	7*
Operational	3.5*
"Two Houses"	6*
"Plot pictures" by N. E. Verax	
Method 1	0*
Method 2	0*
Method 3	0*
Method 4	0*
"Observation of the manifestations of independence"	0*
"Plot pictures"	0*

Note: * - T critical ($p \leq 0.01$)

The practice of using didactic fairy tales in correctional work with children with general speech underdevelopment was effective. The conducted classes contributed to the correction of speech disorders (the vocabulary expanded and became more active, the grammatical structure of speech was normalized), the development of speech expressiveness, and the formation of their moral values. In addition, it was influenced by the work of a full-time speech therapist.

The system of correctional and psychological work with a child of senior preschool age with cerebral palsy with the use of fairy-tale therapy techniques significantly improved the results of social and personal development. The child had improved the skills of transmitting emotions with the help of verbal and non-verbal means of communication,

increased the activity of cooperation with peers and adults, as well as improved speech indicators (enriched vocabulary, increased indicators of the state of grammatical structure of speech).

The use of the method of fairy-tale therapy in relation to children of primary school age with mental retardation allowed us to observe changes in the following: children have learned to better understand their own emotions and the emotions of others, they have improved indicators of self-control and self-regulation, the number of acceptable behavioral patterns in society has increased.

In children with ASD, after the implementation of the program using this method, the level of aggressiveness and anxiety significantly decreased, they became more calm and receptive to communication. However, there was no significant difference in the results of the survey in these children. One of the reasons that the indicators remained at a low level, we believe, is the influence of the main diagnosis on the personality - ASD. As you know, the key sign of this diagnosis is the lack of formation of communication skills and the lack of need to communicate with others. And their correction requires specialized methods, such as Applied behavior analysis, alternative communication, and others. In addition, the low level of communication skills could be affected by frequent skipping of correctional and developmental classes due to the child's illness.

4 Discussion

Despite the specificity and peculiarity of each type of defect, all children with disabilities have the same problems of a social and communicative nature, manifested in a lack of initiative in communication, a low level of empathy, a high level of conflict between children, a lack of proficiency in verbal and non-verbal means of communication, a low level of group cohesion, ignorance of the norms and values accepted in society and a low level of independence.

The conducted experiment showed the importance of fairy-tale therapy and the possibility of using information technologies for the development of communication skills, since the level of their development in preschool children of the experimental group increased after passing the correctional and developmental program.

The development of communication skills is one of the main conditions for the full formation of the personality of preschool children, their mental development and adequate interaction with adults and peers. Timely formation of communication skills is the basis for successful social and personal development.

5 Conclusions

At the ascertaining stage of the study, it was revealed that in both groups of preschool children with disabilities, an extremely low level of communication skills is observed in all the studied parameters.

Based on the results of an empirical study, a correctional and developmental program based on the method of fairy-tale therapy for the development of communication skills, the formation of adequate interpersonal interaction of preschoolers with disabilities was compiled and implemented. When implementing the program, the individual psychological characteristics of children with disabilities and the basic psychological and pedagogical principles of working with such students were taken into account. When implementing the correctional and developmental program, information technologies were used (children viewed domestic fairy tales and cartoons using a computer and a multimedia projector, while performing some exercises in the classroom, a tablet was used, several fairy tales

could be listened to on the social network Instagram), participants listened to didactic fairy tales, and also performed tasks for the development of communication skills.

Analyzing and interpreting the results of the control and evaluation stage of the experiment, we found an increase in the level of development of communication skills in preschool children with disabilities in most parameters in the experimental group, with minor changes in the control group. The conducted experiment showed the importance of using the method of fairy-tale therapy for the development of communicative skills, since they increased in preschool children of the experimental group after passing the correctional and developmental program ($p<0.01$). At the same time, the indicators in the control group remained unchanged.

This conclusion indicates that the development program developed by us is effective and can be used in working with preschool children with disabilities in preschool institutions in the context of inclusive education. The research materials can be used in the academic disciplines of future psychologists and defectologists studying in the following areas of training: "Special (defectological) education", "Psychology", as well as the specialty "Clinical Psychology".

Thus, the tasks set at the beginning of the work were solved, the research goal was achieved, and the hypotheses were proved.

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