



Creating and Evaluating the Effectiveness of a Mobile Application for Children with Speech Retardation

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Abstract: Being the basis of social interaction, speech activity acts as a stimulus for development, therefore, the activation of speech activity in children with complex disorders in various life situations to explain their needs, desires and self-expression is particularly significant. The low level of speech activity limits the possibilities of self-realization of children, does not provide free communication. The formation of such skills should be built from the level at which the child is at the moment, taking into account the available means of communication.

Keywords: speech development, mobile application, communication skills, speech and intellectual norm.

When speech activity is not formed, alternative communication systems come to the rescue, which can become a necessary basis first for meeting primary needs, and later for expressing feelings, emotions and desires. Alternative communication is all methods of communication that complement or replace ordinary speech to individuals, if the latter are not able to explain themselves satisfactorily with it

Each mobile device is designed with a different interface, methods of accessing information (for example, scrolling, tapping, double tapping). It is important to choose a mobile device, work skills and the ability to access it. The presence of a mobile device is not the only condition for effective communication, the cognitive functions of the user are also important. Some people may use a mobile device as an auxiliary technology, while others may prefer the help of other people or other alternative communication systems.

The development and application of computer programs and mobile applications for the development, correction of behavior, adaptation of children with disabilities and facilitation of their communication with others is a relatively new direction in science and practice. Such programs include "Autism: Communication", "Look At Me" (Look At Me), "Speak In Silence", "Sesame", "Proloquo2Go", "Autism Therapy with MITA", "LetMeTalk", "Autism iHelp -Sorting", etc. The analysis of these applications showed that some mobile applications can be used only as a kind of messenger based on one of the alternative systems (Pecs, Macaton, Bliss), while others are able to replace the system of physical cards and other incentive-communicative material on a permanent basis.

The choice of the DARKNESS and the mobile device for its placement. When choosing, not only the level of formation of speech activity was taken into account, but also the mode of movement, the functionality of the hands, the state of vision (screen brightness, clarity and the actual graphic material

in the form of pictograms, drawings or photographs), the state of hearing (the possibility of voicing the acquired icon), the state of intelligence (understanding instructions, cognitive activity). The most optimal application was recognized by us, experts and parents as Let Me Talk, which combines high performance in technical and financial aspects, the possibility of making operational adjustments to images in the general memory of the application.

Work in the dyad "parent -child with complex disorders" using MPAC. In our work, we relied on the key principles and elements of the stages of the PECS communication system. At the same time, in addition to the specialist, the parent (assistant) took an active part. The Let Me Talk app was installed on a tablet and an individual page was prepared for each child with the same images that were used for PECS.

Thus, for children with complex disorders and communication difficulties, it is extremely important to begin the process of mastering communication skills through language, gestures, PECS, MPAC or another system of auxiliary or alternative communication, since mastering speech involves more a favorable prognosis in later life. It is important to note that the "Let MeTalk" mobile application can be an integral part of a program to help a child with complex disorders in the actualization of speech activity. Taking into account the built-up algorithm of work, we have identified an increase in the number of self-initiated communicative acts, the general involvement of preschoolers in communication, which contributed to the development of speech activity of the studied group of preschoolers with complex disorders. A detailed analysis of the approbation of the use of MPAC for the development of speech activity showed not only positive aspects of the application, but also a number of limitations:

1. Children can leave the page with images to view other applications or sections, thus reducing the number of requests generated without prompting, because they had to be physically redirected to the desired page.
2. Parents' unwillingness to apply the system in daily routines and consolidate acquired skills at home.

There are various methods for determining the coefficient of general speech development. They are presented in the format of tests, observation protocols, didactic games and others. All of them involve the use of special forms and manual calculation of the final coefficient. This approach is appropriate for a small number of test takers, but even if all the requirements for the methodology are met, there is a high chance of making a mistake both when calculating the coefficient and when filling in data about the test taker. Further processing of the diagnostic results provides even greater difficulties, since before analyzing the data, it is necessary to transfer them to a digital format, and then use special software tools to process them.

The program of correction and support for the development of speech capabilities for children aged 5-6 years in the C++ Builder system, developed by a team of authors of Southwestern State University, is a game form of testing tasks designed for speech therapists or ordinary users, allowing them to correct, work out and correct speech defects in children. The program displays sections on the screen that contribute to the development of horizons; by performing testing tasks, it provides automation of four problematic sounds: [r], [r'], [l], [l']; provides preparation for the automation of sounds in a playful way, with the help of articulatory gymnastics or "Language Games". The program implements the method of interactive learning, correction and development of speech abilities in children aged 5-6 years, facilitates the perception of information, promotes the assimilation of the material of tasks in a playful way.

Within the framework of the research "Comparative analysis of the practices of implementing a multilingual model of multicultural education (on the example of the Republics of Uzbekistan, North Ossetia –Alania, Sakha (Yakutia), etc.)", performed diagnostic materials were developed for the organization of a comparative analysis of the practices of the introduction of multilingual education in the regions of the Russian Federation: checklists for the study of educational and methodological support of multilingual education in preschool education organizations, questionnaires for pre-school employees implementing language programs, diagnostic tools for the examination of the level of speech development of preschool children, tests on foreign and native languages, a battery of test tasks for assessing psychological parameters (cognitive functions) of preschoolers using computer processing of the material. The authors of this article were tasked with developing a mobile application to automate the process of determining the coefficient of general speech development (CoRR) of preschool children.

During the development of the mobile application, classes were written, divided into three main groups:

1. Classes for working with database tables – include a description of tables and a DAO for working with them, allow you to receive, edit and create records in the database.
2. Screen classes – are used to configure controls and install event handlers.
3. Business logic classes - contain an implementation of the main logic of the application that is not related to the UI.

The implementation of the activity approach provides:

- giving the results of education a socially and personally significant Character;
- Solid assimilation by students of knowledge and experience of various activities and behavior, the possibility of their independent advancement in the studied educational fields;
- A significant increase in motivation and interest in learning, acquiring new experience of activity and behavior;
- providing conditions for general cultural and personal development based on the formation of universal educational activities that they ensure not only the successful assimilation of a system of scientific, skills and abilities (academic results) that allow them to continue their education at the next level of education, but also the vital competence that forms the basis of social success.

Most speech therapists and speech centers in Uzbekistan are engaged only in launching the speech of children with motor alalia, not being able to bring these children to the full speech and intellectual norm. Many of them are sincerely convinced that a full norm is impossible. But I can correct motor alalia to the full speech and intellectual norm by using the following techniques and techniques:

1. Using Kovshikov's linguistic concept, which, at the moment, is the best proven technique for correcting motor alalia. I belong to the 1% of speech therapists who own this technique. The following principles and techniques of the language concept are used in our classes:
 - the correct launch of speech through the formation of phrases with verbs, which allows children with motor alalia to master the necessary number of words, to the same extent as any healthy child.
 - work with semantic fields, which speeds up the memorization process in motor alalics by 10-20 times,

- the actualization of words and grammatical models is used, which increases the motivation of the motor alalia to speech,
- the ontogenetic principle is used in my work. The work is carried out according to lexical and sound-syllabic concentrations, which leads to the fact that with each month of classes your child will differ less and less from his peers,
- in my speech therapy classes, all subsystems of the language are corrected: lexical, grammatical, phonological, phonemic, syllabic. This leads to the absence of dyslexia, dysgraphia, dyslalia, FFN when leaving motor alalia.

It could not be a motor alalia, but some other speech or non-speech (psychological) disorder, but in any case it did not go away by itself. This is what specialists are for - you need to be examined, consulted to understand exactly what is happening to the child. In the case of motor alalia, the child and I are engaged for 2-3 years, and if it is a CPR, then we usually do everything in a couple of months.

Everyone has their own concept of "did not speak" – someone believes that until a child pronounces "armored personnel carrier", he does not speak. That is, when the speech norm is 2-3 years old, parents tell everyone around that the child does not speak yet.

Another reason for the appearance of such stories, comments on the Internet are not very good people. A few years ago, scientists of Uzbekistan found out that some of the infectious patients specifically infect others with their disease. In our case, these people are well aware that they have problems with the child, and deliberately deceive people on the Internet that everything will pass by itself so that the shortcomings of their children are not noticeable against the background of others. That is, in order not to work themselves, it is easier for them to drown others.

To successfully support the development of speech in a child, you need to adhere to certain recommendations to achieve the result.

1. Find a good source.

It is necessary to prioritize the search for high-quality games and applications, rather than entertainment content. Finding apps that support cognitive and language development may take some time. While researching foreign materials, I found a website [<https://www.apkdownload.in/smartappsforkids/>], managed by a staff of speech therapists and teachers. On this site it is possible to find reviews of games and applications by age and subject, including a section dedicated to children with special needs.

2. Play with the child in turn.

It is important to know that learning a language requires human interaction. The ability to conduct a dialogue is a necessary component of communication, exchanging information in turn, asking and answering questions in conversation.

When studying with a child on a tablet or mobile phone, it is necessary to conduct a dialogue and play in turn, thus supporting the development of communication skills. It is also possible to awaken a competitive moment in a child, but it is necessary to let him win, and praise him for achieving the best result. In addition, you can take turns performing simple causal actions (for example, tickling a Talking Tom) to help young children develop this skill. Playing with siblings or peers will also help the child's speech development, but parental support is certainly recommended.

3. Play and try on different roles.

Nothing compares to an active role-playing game, helping children develop their imagination. To date, hundreds of applications have been developed that allow children and parents to invent, imagine and play role-playing games. For example, the applications Toca Boca, MyplayHome and its partner applications MyPlayStore and MyPlaySchool - children can learn hairdressing, cooking, construction, playing doctor and teacher.

4. Watch together.

Watching educational shows, music videos and cartoons can help parents take their mind off work, relax and spend time with their child. Even if a child is watching a video designed to teach concepts and vocabulary, it is necessary to show more attention than passive observation. It is necessary to comment in an entertaining way, ask questions, encourage the child's ideas in order to significantly help him develop and master the necessary skills.

5. Use the tablet to interest the child in communication.

Professional speech therapists, when conducting correctional classes, focus on awakening the child's interest in speech activity. It is necessary to start with applications that have repetitive causal elements. For example, Dr. Panda Mailman and Candy Factory. When playing with a child, it is necessary to hold or pause the game process to clarify or request the child to explain what is depicted in the picture, what color and how to proceed. You can continue playing only after the child speaks a phrase or a whole word. Sometimes, you can also ask clarifying questions during the game.

Mobile Speech Development apps created for children up to school age: "Monkey Junior-Learn to read (in English)", "ABC Games for Kids - EduKitty (in English)", "100 Slova dlya malishey (in Russian)", "pervie slova dlya Malisha (in Russian)", and many other such mobile apps can be used.

6. Read interactive stories.

Often, children refuse to read books considering them boring. The best alternative is e-books. Animated pictures accompanying the text and bright design will hold the attention of children and diversify the reading process.

7. Create your own stories.

An interesting narrative requires a large vocabulary, grammatical skills, organization of thinking and active imagination. Children begin to share their impressions at the age of three, in order to support the development of storytelling skills, there are several applications available. Some of them turn storytelling into a multi-player game, such as Story Wheel. Others, such as Toontastic, can be used more freely to create characters, scenes, and narratives. These apps are great for older kids who can share their stories with parents, teachers, friends, siblings.

8. Support for school education.

For school-age children, a tablet or phone often becomes a source of entertainment, in the form of arcade games or videos. However, it can be used more effectively to revitalize school subjects with little adult support. Study videos related to science homework and geographical topics on Google Earth. You can also learn languages using the Duolingo app. For children who need additional practice in subjects such as reading and mathematics, special applications and source sites have been developed, such as Smart Apps for Kids, Free Tech 4 Teachers and Know What's Inside. In the case of children with developmental disabilities, it is necessary to consult with psychologists and teachers.

9. Skype / Facetime / Google Hangouts.

Language skills are intertwined with social interaction - we communicate because we are social beings. Without a doubt, live communication is an ideal way to support the development of a child's speech. During the global pandemic, you can use the tablet to communicate via Skype with your grandmother, grandfather, family friend or relatives. Video communication can promote the development of relationships between children and distant relatives, and communication skills are important for both younger and older children.

10. Support of the correctional process.

If a child visits a speech therapist and works on articulation, the apps offer a motivating way to get the necessary daily practice of the necessary sounds. It is always necessary to consult with a speech therapist, as a professional will be able to recommend which target sound and level to practice (sound, word, phrase, etc.). There are several applications available that specifically target the production of certain sounds and speech correction in general, but they are included in the segment of paid applications. For example, Articulation Station, ArtikPix, Speech with Milo.

Using the above points, you can maximize the possibilities of teaching a child's speech when he uses a phone or tablet. It is also important to remember that it is necessary limit screen time and balance it with real game play and interaction.

The practice of supporting young children with speech disorders by means of mobile gaming applications is the optimal solution at home and allows for the support and development of existing speech skills mastered by the child in the conditions of speech therapy.

The specialists of the Kidarkit company have completed the work on the creation of the mobile application "My Communicator", designed for the rehabilitation and habilitation of people with mental disorders. The novelty was developed with the support of the Ministry of Industry and Trade of Russia.

The mobile app is a free, safe and simple game for speech formation and non-verbal communication. It helps to master communication skills in an exciting way and gradually come to an independent life. "My Communicator" was developed together with professional teachers who have devoted themselves to working with special people, including children.





The manual is a course on the study of the mechanism of communication without the use of words. In it, you can choose the appropriate training format from four modules:

- "Buttons" – when you press one of the two buttons, a visual effect is activated. The user remembers which of the buttons triggers one of the two effects, and then can show the skill of choice by clicking on the button of interest to him.
- "Option selection" – the user is presented with several cards to choose from, and he must choose the object of interest to him. The task must be supported by the physical provision of the selected object. This stage helps in the formation of a causal relationship, and also contributes to the development of the skill of choice and communication without the use of words.
- "Making sentences" is a communication board with which the user can make a sentence and express his thoughts and desires without using words.
- "Dictionary expansion" will help in the development of speech and the study of environmental objects.

The application is suitable for classes with people with speech disorders and diagnoses associated with a mental disorder (autism, mental retardation, cerebral palsy, mental and speech development delay, Down syndrome).

New mobile applications makes it possible to increase the availability of speech therapy for children in Uzbekistan with speech development delay, articulatory dyspraxia, dysarthria, alalia, lack of speech in autism spectrum disorders, intellectual disability and other categories of children is confirmed by feedback pediatric neurologists from speech therapists, speech pathologists and parents. It is tracked through reviews in app stores and on social networks.

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