

Interactive Computer Technologies to Support and Develop Reading in Primary School Children *

Alevtina I. Arkhipova ¹[0000-0003-0363-348X], Sergey P. Grushevsky ²[0000-0002-7263-4673],
Viktor A. Ivanov ³[0000-0002-0541-6457], Elena A. Pichkurenko ⁴[0000-0003-2198-3627],
and Svetlana P. Shmalko ⁵[0000-0002-6456-9648]

¹ Kuban state University, Krasnodar, Russia
aiam@bk.ru

² Kuban state University, Krasnodar, Russia
spg@kubsu.ru

³ Kuban state University, Krasnodar, Russia
SuperNova779@yandex.ru

⁴ Kuban state University, Krasnodar, Russia
apelena1961@mail.ru

⁵ Kuban state University, Krasnodar, Russia
shmalko_sis@mail.ru

Abstract. The main provisions of the concept of the State Program for the support and development of reading in the structures of the education system are described. The role of reading in the theory and practice of teaching younger students as the main skill that ensures the success of students' academic achievements is shown. The factors that led to the crisis in the reader's culture caused by the difficulties of information exchange and the loss of interest in reading among the majority of the population due to the dominance of audio and video information are substantiated. It is shown that the use of computer technologies in education can change the situation and create conditions for the support and development of reading techniques, integrating the appropriate techniques of classical didactics with interactive educational resources. Examples of computer technology "Visual dictation" with variable versions of content aimed at developing skills such as RAM, reading fields, semantic guesswork, etc. are demonstrated. The author's position on the need to train teachers to independently modify the proposed programs for the implementation of new learning tasks in the paradigm of digitalization of education is important.

Keywords: Informatization of Education, Development of Reading Techniques, Information Communication, Interactive Computer Technologies, Visual Dictation, Reading Methods, Functional Reading.

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1 Introduction

In the modern world, information processes have become more complicated due to using different sources and receivers of information. Moreover, the style of information communication has changed significantly because of the unjustified invasion of numerous foreign language terms into the space of the Russian language. As a consequence, the "Great and mighty" have been filled with technical and economic slang. Nowadays fragmentary information dominates the information space. It has replaced systematized and scientific information, both printed and electronic. This is, in particular, true for social networks, where written Russian speech is substituted by pictures and photographs. Thereby networks wean young people away from reading texts. Interaction with information in technical computer devices, where multi-way opaque navigation is usually used, is inordinately complicated. Primarily, the older generation feels uncomfortable dealing with them. Electronic interaction between the state and the population for the participation of citizens in solving socially significant problems is insufficiently developed. For example, citizens' appeals to the officials are often blocked by "capcha". Also, there has been a tendency to replace reading books with a computer among pupils and students [7].

To give an illustration, let's look at the example. A group of senior pupils attended the laboratory of our faculty to solve Olympiad tasks. We found that some of them were reading the textbook "by syllables", but they were well oriented in computers and quickly found all the necessary files.

The factors mentioned above hinder the development of Russia as an information society. As a result, the formation of a new technological order, which is positioned as a "period of knowledge", with the domination of reading and books regaining its former role, as one of the main carriers of culture and achievement of civilization, slows down.

2 Main Content

2.1 Problems of Functional Reading in the Context of Digitalization

The main reason for the growing deficit of knowledge in Russian society is losing interest in reading among the population, in particular among pupils, which shows the crisis in reading culture in general. Eventually, the crisis can cause social risks due to reading is the most important way of assimilating vital information. Without it, the integration of the individual into the multinational Russian culture, with its spiritual and material values, is unthinkable. Losing interest in reading is a global trend. In many countries, this process is being counteracted because of the understanding of its role in development.

In this regard, the task is to generate interest in youth and adolescents to reading and create pedagogical conditions for the public prestige of reading as a cultural value. In the National Program for Reading Promotion and Development in Russia [12], the problem of reading is considered as a socio-cultural process in the context of the development of an information society. At the same time, implementing the program should

be accompanied by an increase in the intellectual potential of the nation, which will become an instrument for preserving and developing Russian culture. One of the main roles in solving this problem should be played by the education system. For which in turn the intensification of the reading process is one of the most important professional problems.

The reading issue has increased significantly in connection with the beginning of the process of global digitalization of education [4], which put many of the most important problems of classical pedagogy aside, by giving priority to digital technologies and innovative programming solutions. For this reason, the activities of the National Program for Reading Promotion and Development must be included in the structure of education digitalization. At the same time, we understand digitalization processes as a fundamental change in all components of the educational process – from methodology, its content, methods, teaching tools, scientific and methodological support for the educational process and educational work in general, to the dominant paradigm.

The modern process of global digitalization of the education system has expanded intensively both in the theory and in the field of hardware and technological support [1, 5]. But the development of methodological aspects continues to lag behind that new social phenomenon. In this connection, the modern development of interactive information technologies is aimed to create interest in reading, especially in functional reading. Functional reading contributes to the development of students' intellectual abilities, the purpose of which is searching for information, understanding and interpreting a text as well as using the information for solving a specific problem. A person who can read this way can identify the topic and the main idea of the written text, take the necessary information from it, draw a conclusion, distinguish the author's point of view and understand the expressions which have figurative meaning [10].

Therefore, reading is more than just linking written signs with the corresponding sounds. This is a complex cognitive process in which higher mental functions are involved. The reading process also includes a semantic one.

At the same time, reading comprehension is associated with the translation of written speech into oral one. Reading acts as a means of language acquisition, communication, exchange of information, requiring a creative approach and critical analysis. For this reason, in the process of digitalization of education, it is necessary to create special technologies that correspond to the specified features of the reading process, as well as the age factors of pupils. These technologies should be integrated into electronic educational resources [14].

The formation of fluent and conscious reading skills will inevitably lead to the successful assimilation of knowledge and competencies. That will be possible through systematic and purposeful development of conscious, expressive reading from class to class [13].

2.2 Computer support for functional reading

The first reading process research was initiated by French scientist Louis Javal in 1879 [6]. However scientific research in the field of rationalization of reading in Russia began only in the 1920s. Since then, studies on reading problems became widespread. In particular, some international organizations had been established to study the issues of

rational reading. Special congresses focusing on methods of rationalizing reading are held systematically since 1966. It has been proven that methods of teaching fast reading are based on the development of the ability to understand the written text and the rational organization of the reading process, i.e. the problem of functional reading has been actualized.

There are three methods in the practice of teaching to read - analytical, synthetic, and analytical-synthetic. The first method begins with the assimilation of words and sentences; the second one involves the formation of words and sentences from letters and syllables. The third method, analytic-synthetic, is based on taking advantage of the first two methods (see Fig. 1).

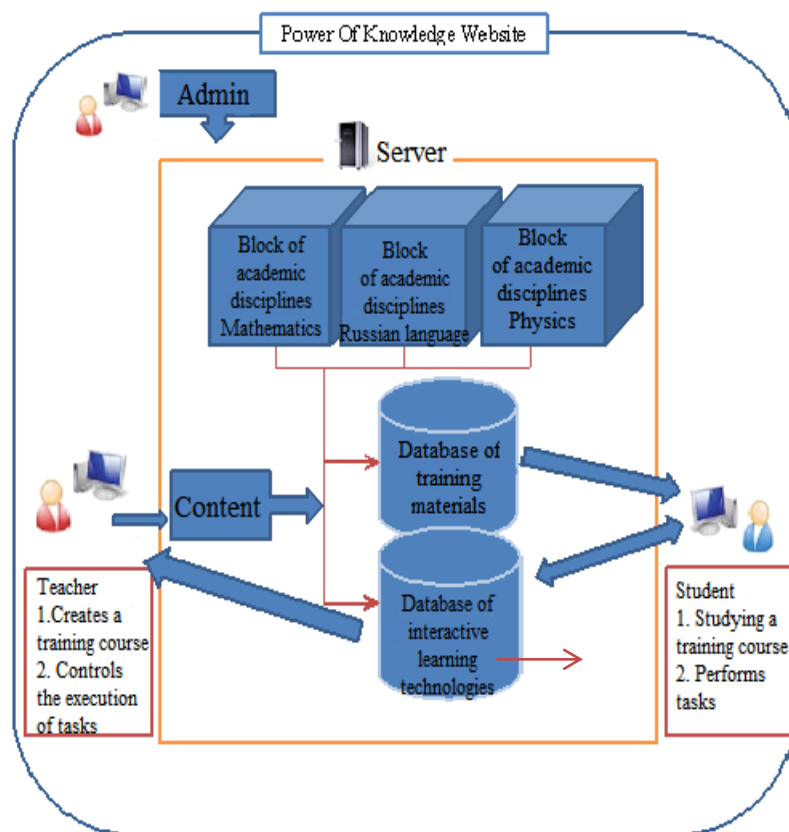


Fig. 1. Site layout The power of knowledge.

The works of many researchers on primary education are devoted to improving the reading technique in primary school children (S.A. Anichkin, V.G. Goretsky, O.V. Dzhazheley, V.N. Zaitsev, I.T. Fedorenko, M.I. Omorokova, L.F. Klimanova, TS

Piche-ool, Z.I. Romanovskaya, N.N. Svetlovskaya), as well as the works on the formation of interactive technologies and environment.

However, there is still not enough attention paid to the design of information technologies for the development of functional reading techniques of primary school children. Therefore, there is a vital need to create means of computer support for this form of intellectual activity. A team of teachers, graduate students, and students of the Kuban State University carried out a study of the problem of functional reading and created a complex of special electronic resources.

The main goal of the study was to create a system of educational materials for the development of skills of quick conscious reading in primary school children using programs on the HTML platform. To achieve this goal we used the analysis of scientific and methodological literature, as well as the means of computer didactics. [2]. In the process, the following tasks were solved: studied the existing methods of developing functional reading skills, selected computer technologies suitable for creating means of developing reading techniques in primary school children; developed educational content and included it in the software component of educational technologies; created a system of computer support for the formation of functional reading skills from local and network versions of technologies and checked their effectiveness. A visual example of using technologies in practice is the site "Power of Knowledge" «<https://yaznau.ru/>», the structure of its construction can be seen in diagram 1.

In the course of the research, the following methods were used: the study of psychological, pedagogical, scientific, and methodological literature on the problem of research, cognitive modeling of intelligent systems, pedagogical experiment, statistical processing of the results of the experiment. The initial stage of the functional reading process consists of understanding the text as the main result of mental activity during reading. It is known that "understanding" is the concept of hermeneutics, in the center of which is the theory of understanding. Therefore, the methodological basis for all reading problems is the hermeneutic approach, as the methodology of modern humanitarian knowledge. One of the central ideas of hermeneutics is that the process of understanding a text moves in a hermeneutic circle, i.e. the transition "general - particular and vice versa" is carried out. Besides, hermeneutics also acts as a philosophical method for text analysis.

At the present, the ideas of hermeneutics have penetrated the field of pedagogical knowledge (pedagogical hermeneutics), enriching the practice of teaching functional reading. For example, we can consider the technology "interactive crossword" (see Fig. 2), the "Visual dictation", etc. The electronic resources created at KubSU have not only a didactic component for teaching students but also a methodological one for training teachers. Due to that teachers can create new technologies. [3, 9] These resources include algorithms for modifying educational content. For example, there are tasks for a teacher to create the "Visual Dictation" technology below.

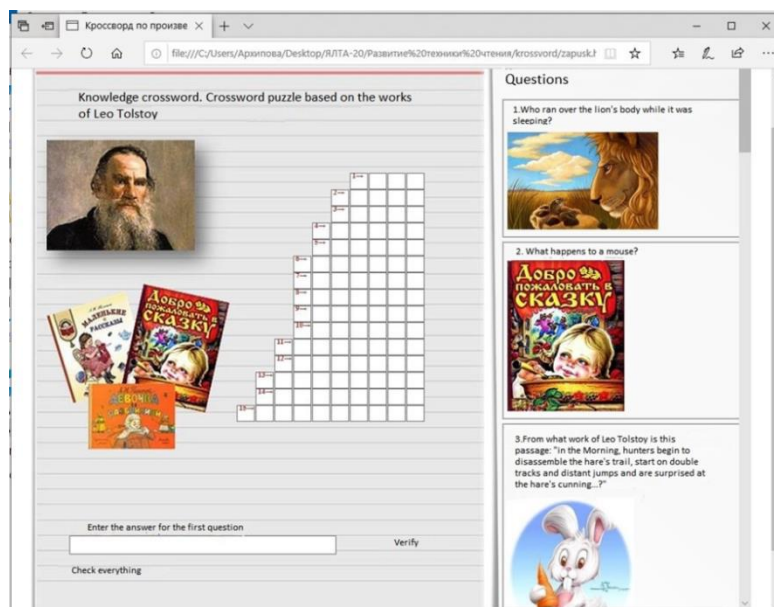


Fig. 2. Interactive crossword puzzle working field.

Task on the interactive technology for the teacher the "Visual Dictation"

1. You need to create an interactive web page the "Visual Dictation" to master and self-test knowledge on the educational topic by using the proposed text and algorithm from the program "Matrix of technologies of innovative computer didactics".

2. The ready new version of the technology must be tested with the involvement of colleagues.

3. You need to prepare the article Interactive Technology "Visual Dictation" as a tool for semantic reading of texts, where you describe the method of creating the technology, its methodological features, using it in the educational process, etc.

The text of the assignment for the "Visual dictation".

Click on the word "Text". It will disappear in 5 seconds. In the white box, write down the absent word...: in the forms of information presentation; in ways of presenting information; in the last line of text.

Dictation (Folder "diktant" → launching file "index.html"). The technology is called a dictation since for its implementation it is necessary to remember the text, which quickly disappears.

The aim is to memorize the spelling of words (see Fig.3), write sentences and words into the answer window. The program reports the result, for which you need to click on the active button. The technology has five options linked by the "Next" link. Modification of the program includes replacing pictures in the "images" folder, as well as Russian words.

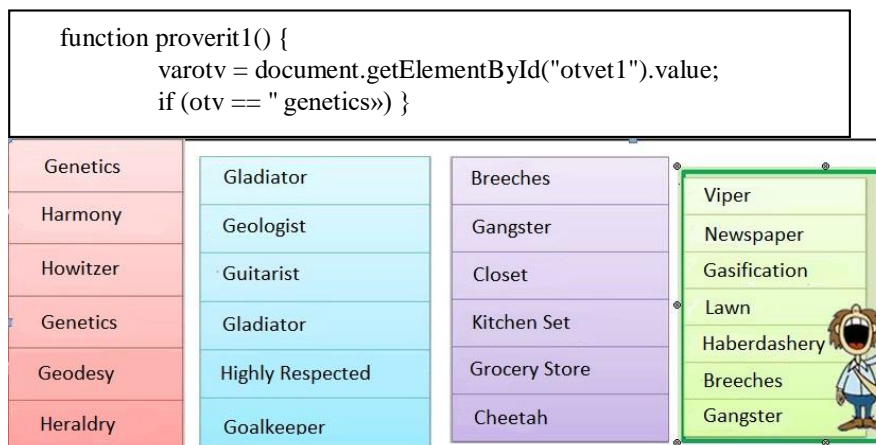


Fig. 3. Disappearing texts.

Algorithm for modifying content:

- 1) replace the picture in the "images" folder by arranging the disappearing text in the form of an image;
- 2) open the program (EditwithNotepad);
- 3) insert a new name and new text into the "index.html" file;
- 4) in line 28 of the program, change the text display time;
- 5) change the text in line 70 of the program;
- 6) replace words-answers in the program;
- 7) change the link in line 62 of the program;
- 8) repeat the dictation 3 times using the "Next" links.

The famous bibliophile and psychologist N.I. Rubakin, the author of many works about a book, said that "reading is the creation of your thoughts through the thoughts of other people," and the essence of the matter is "what you made up when you were reading books." Therefore, it is so important from an early age to instill in a childhood love of reading, an interest in books, and show not only its role in life but also equip the child with the ability to read. At the present, the solution to this problem is greatly facilitated with the use of computer technologies, including different versions of the "Visual Dictation [8].

3 Experiment

We carried out an empirical study. Its purpose was to create a complex of electronic technologies for the successful development of reading techniques among primary school children and test their effectiveness. The main method was a formative experiment, which took place in MBOU Secondary school №10 in Krasnodar (third-grade pupils). The objectives of the experiment were:

- to develop a set of exercises with computer support to ensure the process of mastering reading skills;
- to choose a base for empirical research, control, and experimental classes;
- to identify the level of development of reading skills among pupils;
- to carry out a follow-up study and evaluate the development of reading skills;
- to confirm the effectiveness of information educational technologies.

As the experiment showed (Fig.4), interactive computer technologies have a positive effect on the educational achievements of primary school children, not only in the field of the Russian language and literature but also in other subjects, which is reflected in the final charts of the performance of third-grade pupils. The positive impact of the use of interactive computer technologies on the severity of motivation to acquire knowledge increased: in the Russian language by 6.2%; reading by 26.6%; in mathematics by 26.6%; the surrounding world by 24.7%, in history by 30%. The results have shown an increase in the level of cognitive interest in learning by an average of 20.5%, and the level of emotional tension and anxiety decreased by an average of 14%.



Fig. 4. Monitoring the performance of students in grades 3 by results I quarters (left) and IV quarters (right).

4 Conclusions

As a result of the study, we revealed the essence and structure of developing a reading technique using technologies of computer support for reading. We also generalized the experience of teachers, studied materials for empirical verification of the selected skills, and created new means of e-learning in reading techniques.

Today, every schoolchild owns the skills of online communication using social networks and various gadgets and devices. To use these skills is the task of a modern teacher [15].

The specificity of educational computer technologies created by teachers and graduate students of the Kuban State University is fundamentally different from the electronic educational resources presented on the Internet sites. Designing our educational software products, we set out the goal of training teachers to create new educational

materials with computer support independently. We also use open-source programs and provide algorithms for modifying educational content in our products [3, 11].

At the same time, other creators of software products for schools offer their works in a finished and unchangeable form that does not allow any modification of either the form of information presentation or its content. However, this approach excludes creative beginnings in the teaching profession.

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