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## **Application of information technology for development of memory**

In the article processes occurring in memory are considered. The study of the laws of human memory, the mechanisms of its work is one of the central and most weighty chapters in psychology. Memory is special among other mental cognitive processes. The main processes are memorization, preservation, recognition and reproduction. The article describes the technologies that affect the expansion of memory boundaries. The authors describe the work of the Memory Tester application that is intended for the development of memory and imaginative thinking, increasing the volume and speed of memorizing and structuring information, expanding the field of view. The program implements memory development methods such as «Schulte's Table», «High-speed memory», «Visual memory», «Mnemonic of words», «Mnemonic of numbers», «Pairs of words». The simulator contains a system of profiles, thanks to which several people can work on one computer. Each user of the program can choose one or another exercise program based on their memory features. The simulator will store the data of each user separately from each other. With this simulator, a person can find their weaknesses in memory and develop them or improve their strengths.

*Keywords:* Memory, mental cognitive processes, expansion of memory boundaries, memory development methods, Memory Trainer, simulator, Schulte's table, high-speed memory, visual memory, mnemonic of words, mnemonic of numbers, pairs of words.

The study of human memory laws, mechanisms of its work is one of the main and most powerful chapters in psychology. Memory is special among other mental cognitive processes. Many researchers agree that the memory unites all cognitive processes into a coherent whole. Memory is the basis of human mental activity. It is no secret that the memory value of human life is simply colossal, because without it would be impossible any activity. No memory spans in front of us the way to understanding the basics of formation of behavior, thinking and consciousness, unconscious. Memory is a kind of the cornerstone of playing a leading role in the training and education of the person, the person acquiring the knowledge, experience and skills.

The main processes are memory storage, retention, recognition and recall. Memory is a process whose action is directed to the preservation of memory of any information, a sort of preparatory stage before saving the information itself. Saving is a process aimed at full processing, classification and synthesis of information. Training and reproduction are the processes of restoring already received information. The difference between them is that the re-recognition occurs at a meeting already perceived object or when attempting to re-perception of the object, and reproduction is the recognition object in its absence. Depending on the presence or absence of contrary purpose of memorizing, remembering divided into two types: voluntary and involuntary [1].

One of the most important is the question of the possibility of expanding the memory boundaries. The fast pace of modern life for each person falls whole flood of information to memorize. There are different methods and techniques through which you can quickly and accurately remember the information for the long term.

Main mnemonic techniques to remember information such as

- education meaningful phrases from the initial letters of memorized information;
- rhyme
- finding and the use of bright unusual associations;
- method of Cicero;
- method Aivazovsky;
- special methods of memorizing numbers;
- techniques to memorize foreign words.

Also in this list can include a reception for the extension of the field of view and increase the amount of memory Schulte table [2].

Automation of these methods, the transfer from paper to software representation facilitates the exercise. Preparation of any tools or materials in the form of a sheet of paper with a sequence of words or figures or

images becomes unnecessary. One does not have to manually calculate the time spent on memorization, counting the number of correct answers and more. All manipulations are carried out automatically, allowing the user to concentrate on the essentials.

Memory Trainer is software developed as a result of the study, is intended for the following purposes: development of memory and creative thinking; increase the speed of information storage; increase speed to structure the information; extension of the field of view; increase in the volume of memorized information [3].

With this simulator person can find their weaknesses and develop their memory and improve their strengths. The simulator contains profiles system by which one computer can deal with a few people. The simulator will store the data of each user separately.

The simulator provides such exercises as «Schulte Table», «High-speed memory», «The image (visual) memory», «Mnemonic words», «Mnemonic numbers», «Pairs of words». Each exercise has a short help for the convenience of the user (Fig. 1), where it can get information on how to do the exercise.

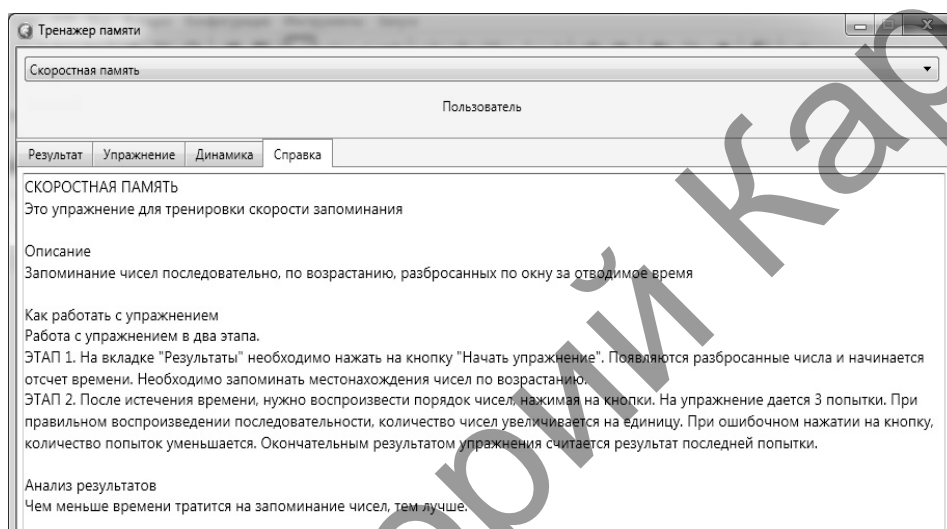


Figure 1. Tab «Help»

Each exercise is designed to train the different types of memory. You can train your memory by selecting one of the exercises or use them in combination. The program provides functionality through which you can see the results of the dynamics of change. On the tab «Results» the user can see the top ten of their results on the exercise depending on the complexity of the exercise. Also on the tab «Results» the user can start the exercise by selecting the appropriate options exercises (Fig. 2). The program automatically switches to the tab «Exercise», exercise and loads to the set parameters by clicking «Start exercise».

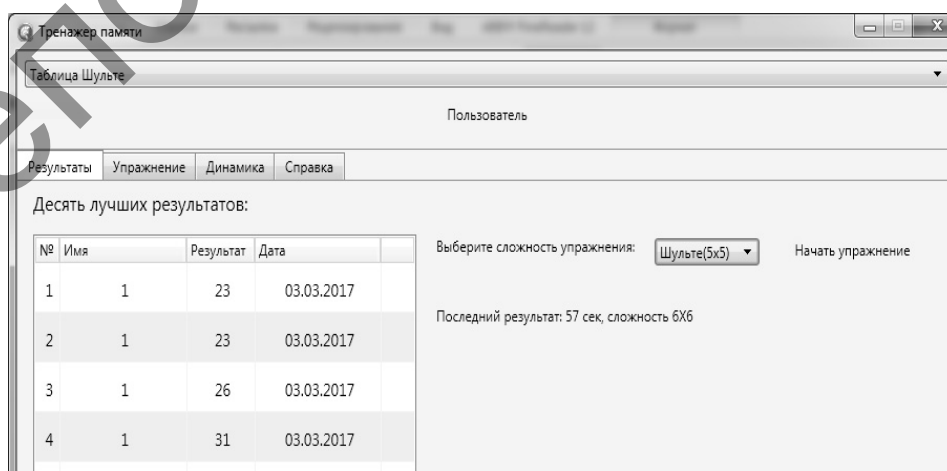


Figure 2. The tab «Results»

Exercise «Schulte Table» is aimed at expanding the field of view, the development of peripheral vision and the development of attention. Program Memory Trainer is an exercise used for the same purposes and for the development of information structuring. To exercise the user must look into fixing the center of the application window, click on the numbers consecutively in ascending order as shown in Figure 3.

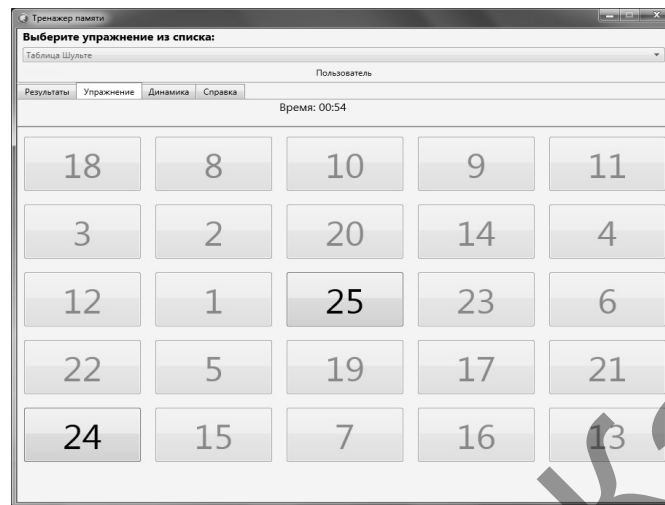


Figure 3. Exercise «Table Schulte»

Pursuing this exercise, it is important to understand that the user trains his visual skills. Initially, the user when performing the exercises may be some difficulties, but with each of the following table the user will find a number of faster and faster.

Exercise «High-speed memory» is intended to increase the field of view, the increase in memory speed and structuring information. This exercise will allow the user to quickly memorize information and correct its structure.

At the beginning of the exercise to the user in the window will be randomly placed numbers, as shown in Figure 4. The user must remember the arrangement of numbers in ascending order in a certain time. If you have never performed this exercise, the program will automatically start an exercise with the amount of numbers equal to three and the allotted time is seven seconds. If the user has already performed this exercise, the program will start the exercise with the amount equal to the maximum numbers of user achievement. After the expiration time the program automatically hides the number and the user has to repeat the order numbers by pressing the round button, as shown in Figure 5.



Figure 4. The process of memorizing numbers

In this exercise it is given 3 attempts. If you are playing about the user makes a mistake, the number of attempts is reduced and the program automatically reduces the amount of numbers to memorize and the user must re-memorize a new sequence of numbers in the allotted time.

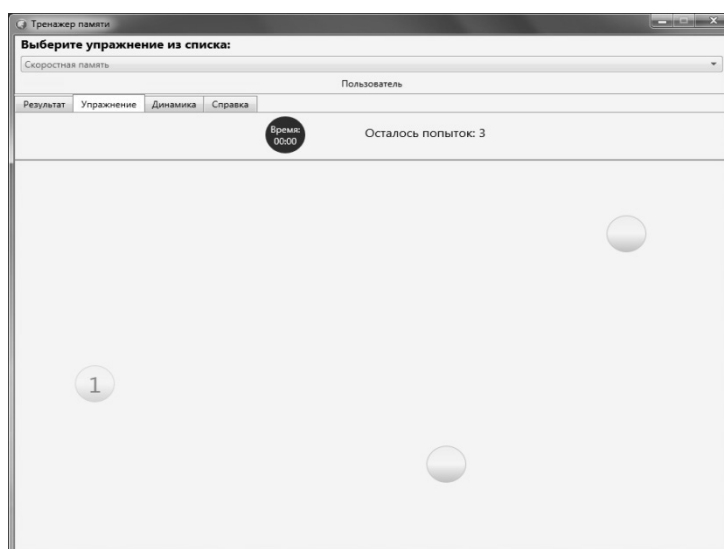


Figure 5. Playing a sequence of numbers

Exercise «The image (visual) memory» is designed to develop skills in image memory and creative thinking, structure the information. To start the exercise the user must select the type of images and the number of pictures to remember. The user can memorize the sequence of playing cards or dominoes. Playing cards and dominoes were chosen because they have many details that must be remembered as accurately as possible.

The user must remember a sequence of pictures from left to right, top to bottom (line by line). After memorizing the sequence you must click on the «Check» button. The timer stops and the image mix. Next, the user must reproduce the sequence pictures by dragging with the mouse in a special rectangular box in the lower right corner of the window. If selected images match to the original sequence, then they will disappear.

Exercise «Mnemonic words» intended for the development of short-term memory skills to structure the information and memory speed. Daily practicing remembering sequences of words, the user will gradually improve the time it takes to memorize and learn how to properly and quickly store and organize information.

Users need to remember a sequence of words from top to bottom and left to right. After storing the user needs to click on the «Check» button. The timer stops and the words mixed up. The user has to repeat a sequence of words from memory by clicking on the word. If the user plays a sequence, the words will not be available which have already been selected. For each error added 15 penalty seconds to the time that was spent on memorizing sequences.

Memory Trainer is a program with which you can determine the level of its memories, its strengths and weaknesses and to train them. Each user of the program can choose one or another exercise program based on their storage features. You can train your weaknesses and improve your strengths, or doing both together.

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## Жадыны дамытуға арналған ақпараттық технологияларды қолдану

Мақалада жады үрдістері сипатталды. Адам жады заңдарын зерттеу, оның жұмыс тетіктері психологияның негізгі және ең қуатты тараулардың бірі болып табылады. Жад басқа психикалық танымдық процестердің арасында ерекше болып табылады. Авторлар жад шекараларын кеңейту үшін жаңа технологиялар ұсынды. Ақпараттық-кеңейтім, құрылымдау көлемін және жылдамдығын артты-

ру мақсатында жады және шығармашылық ойлау қабілетін дамыту үшін арналған Memory Tester лауазымдық қосымшасын сипаттады. Мұндай «Шульте кестесі» ретінде есті дамыту бағдарламасы жүзеге асыру әдістері, «Жоғары жылдамдықты жады», «Суретті (көрнекі) жады», «Сөздер мнемоникасы», «Сандар мнемоникасы», «Сөз жұптары» бағдарламаның әрбір пайдаланушы біреуін немесе олардың жад ерекшеліктері негізінде басқа жаттығу бағдарламасын таңдай аласыз, сондай-ақ бір-бірінен бөлек әр пайдаланушының деректерін сақтайды. Осы тренажерлар арқылы адамдардың әлсіз тұстарын табуға және олардың жады дамыту немесе олардың күшті жақтарын жақсартуға болады.

*Кілт сөздер:* жад, психикалық танымдық үрдістер, жад шекараларын кеңейту, жад артатын әдістер, жад жаттықтырушысы, симулятор, Шульте кестесі, жоғары жылдамдықты жады, визуалды жады, сөздер мнемоникасы, сандар мнемоникасы, сөздер жұптары.

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## Применение информационных технологий для развития памяти

В статье рассмотрены процессы, происходящие в памяти. Отмечено, что изучение законов человеческой памяти, механизмов ее работы является одной из центральных и наиболее весомых глав в психологии. Память является особенной среди других психических познавательных процессов. Главными процессами являются запоминание, сохранение, узнавание и воспроизведение. В статье приведены технологии, влияющие на расширение границ памяти. Описана работа приложения Memory Tester, которое предназначено для развития памяти и образного мышления, увеличения объема и скорости запоминания и структуризации информации, расширения поля зрения. В программе реализованы методы развития памяти, такие как «Таблица Шульте», «Скоростная память», «Образная (зрительная) память», «Мнемоника слов», «Мнемоника чисел», «Пары слов». Тренажер содержит систему профилей, благодаря которой на одном компьютере могут заниматься несколько людей. Каждый пользователь программы может выбрать те или иные упражнения программы исходя из своих особенностей памяти. Тренажер будет хранить данные каждого пользователя отдельно друг от друга. Выделено, что с помощью данного тренажера человек может найти свои слабые стороны памяти и развить их или совершенствовать свои сильные стороны.

*Ключевые слова:* память, умственные когнитивные процессы, расширение границ памяти, методы развития памяти, тренажер памяти, симулятор, таблица Шульте, скоростная память, образная (зрительная) память, мнемоника слов, мнемоника цифр, пары слов.

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