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Research Article

METHODOLOGY OF USING ELEMENTS OF MENTAL ARITHMETIC IN THE FORMATION OF MATHEMATICAL CONCEPTS IN ELEMENTARY SCHOOL STUDENTS

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Mamirova Zulxumor Narbaevna
Teacher Of The "General Pedagogy And Psychology" Department Of The Navoi State Pedagogical Institute, Uzbekistan

ABSTRACT

The article examines the theoretical aspects of the intellectual development of preschool children through an unconventional method of teaching preschool children mental arithmetic using Japanese horizontal arithmetic abacus , called “mental arithmetic”.

KEYWORDS

Intelligence, mental arithmetic, teaching methods, mental arithmetic, preschool children.

INTRODUCTION

The process of increasing the volume of information and the volume of knowledge in the modern information society is rapid. To ensure the competitiveness of specialists, the economy, and the state in the world market, citizens of the country need to continuously master constantly emerging new knowledge and skills. Initial preparation for this is carried out at school. But the time spent in school is limited and, of course, it is impossible to significantly increase it, since a significant part of the young working population will be cut off from production. The solution to this problem must be sought in the intensification of education. That is why new effective teaching methods are becoming an important component of the educational process today.

Today, the state, society and family determine the main goal of modern school education: not only teaching subject knowledge, but also developing

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the student's potential, creating favorable conditions for the realization of his natural abilities. This is due to the fact that rapidly developing changes in society and the economy today require a person to be able to quickly adapt to new conditions, find optimal solutions to complex issues, show flexibility and creativity, and not get lost in situations of uncertainty. The goal of the school is to prepare a graduate for life in modern society with the necessary set of modern knowledge and competencies that will allow him to feel confident in a rapidly changing environment.

To solve such problems, as well as due to the emergence of the information society, new pedagogical technologies, effective forms of organizing the educational process, and active teaching methods are required. A modern school graduate must not only gain knowledge, but also develop the readiness and ability to constantly improve the knowledge acquired, and "learn to learn" for the rest of his life. This approach defines the role of training, which consists in equipping students with such general principles, techniques, methods, actions that will allow them to solve a wide range of practical problems, distracting from the variety of external factors - to generalize essential features according to their content; to teach how to manage their mental and educational activities, rationally and productively master educational, scientific, technical and other literature and "not get lost" in the information flow, which ensures their full existence in modern society.

As you know, the human brain independently extracts important information from the world around us. And reading is inextricably linked with mental activity. The task of fast reading is to increase the efficiency of the reading process and its productivity. The solution to this problem can be achieved by developing new, effective programs of mental activity, by teaching new methods of encoding information coming from outside.

By acquiring speed reading skills, a person improves not only the area of reading - there is a complex impact on various aspects of a person's mental activity. During the learning process, a restructuring of thinking occurs.

Attention is of great importance in a person's life: without it, other mental processes cannot be complete. Fast reading requires increased attention. Therefore, it is necessary to develop the skills of mental concentration and concentration. Proper attention is of great importance for human mental activity. At the same time, it greatly influences the understanding of the text, the accuracy and depth of assimilation of the content. The effectiveness of reading largely depends on how much the reader is able to control his attention. Attention training is important not only for reading. All types of activities require attention and the ability to manage it. Naturally, after a careful, meaningful reading of the text, it is necessary to remember and retain the most important information from what you read. Therefore, effective memory training is necessary.

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The acquisition of new knowledge undoubtedly builds on existing knowledge in memory. Memorization is an active, creative process, during which an "increase in knowledge that fits into memory" is created by comparing the new and the old. Due to the informatization of society and education, one of the most popular directions is the development of memory based on information technology, based on various types of memory: visual, auditory, figurative, verbal logical, analog, algorithmic and others. These different types of memory must be used as aspects of one process, which complement and activate each other, significantly increasing the efficiency of memorization.

Let us note that the most convenient "testing ground" for the formation of these human qualities is mathematics. Let's look at them.

1. Attention is very important for learning mathematics. An "inattentional" error leads to an incorrect solution to the entire problem, unlike, for example, humanities subjects. There, an error in just one place does not change the essence of the entire text. And spending time returning to the beginning of solving a problem gives feedback - best of all, it forces you to be attentive.
2. Memory for mathematics - recalling the necessary definitions, statements, formulas. Mathematics contributes to the strong development of semantic memory, since in order to solve a specific problem it is necessary to select suitable previous material according to its meaning. There is a strong relationship between memory and logical thinking.
3. Comprehension is associated with the ability to analyze text. In addition, what is understood is better remembered. On the other hand, in mathematics, without analyzing the text, it is impossible to translate the meaning of the problem into the language of formulas. That is, mathematics, like nothing else, contributes to the development of the ability to analyze text.
4. Establishing relationships between concepts is the basis of mathematical perception. This gives rise to the development of the conceptual apparatus.
5. Fast reading is important everywhere, but in mathematics this is the ability to isolate the main thing to translate the meaning into mathematical language. Constant training has a strong impact on the speed of perception of material.

But already from the first grade there is an opportunity to engage in mental arithmetic, which largely develops these qualities. Unfortunately, the second half of the last century is characterized not only by the introduction of computer technology, but also by a decrease in attention to the development of mental arithmetic abilities. This began to affect students. Fewer and fewer of them showed a penchant for mathematics, and all students' ability to think strictly and carry out their reasoning logically decreased. Pedagogical science drew attention to this and proposed returning to the development of the ability to count orally. A new method of

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teaching mental arithmetic has emerged - mental arithmetic.

Thousands of years ago, the people of China invented an unusual abacus - the abacus. In the 16th century these same abacus reached Japan and also gained popularity there. These same abacus (abacus) help you learn how to quickly count in your head, add, divide and perform other operations with large numbers faster than a calculator can do it.

It has been proven that in humans, the right hemisphere of the brain is responsible for creativity, perception and creation of images, and the left hemisphere is responsible for logic. Therefore, it is necessary to take into account in the learning process that the synchronous work of both hemispheres provides enormous potential for the development of students. Mental arithmetic is the main means of developing the mental abilities of primary school students. And the main task of mental arithmetic is to involve the entire brain in the educational process. This is done by performing operations on accounts with both hands, and then in the mind. Mental arithmetic not only helps you master quick calculation skills, but also helps develop analytical skills. Abacus trains and improves mental processes. Over time, the need for accounts disappears. Students develop imagination and can carry out all calculations in their heads.

The main goals of mental arithmetic are concentration, the ability to focus on the task at hand, the development of photographic memory and creative thinking, logic and imagination, hearing and observation. With a professional approach and successful achievement of goals, the child can perform complex arithmetic tasks in his head. The program not only covers the mathematical area, but also helps the child in other educational areas. She gives him confidence. And what is important here is not spectacular performance in oral arithmetic, but rather the formation of the necessary qualities of the student.

The results of practice prove that mental arithmetic is very useful and effective. If you allocate two to four hours a week to implement this technology, then after just a few months of training you will receive certain results. Students noticeably improve their memory, develop creative thinking, and increase concentration and concentration. These changes were noted by the students' parents. There is also a significant increase in their overall academic performance. Students feel more confident in lessons and are more willing to go to school. True, mental arithmetic classes do not affect the ability to read quickly with full understanding of what is read. This also needs to be done from first grade. It is necessary not only to achieve the speed of reading text by the number of words in the text read per minute, but to train the ability to quickly understand this text. This can be achieved by training in retelling the text read, the ability to answer questions about the content and ask questions about it yourself.

compressive learning methodology is based on these developed qualities , which allows, through

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new forms of perception, discussion, analysis and comprehension of the material, to significantly increase the efficiency, speed and quality of learning. Compressive learning is a technology that teaches the ability to absorb significant amounts of information in a very limited time. It includes the integrated use of such areas as the development of memory, attention, fast reading techniques, the ability to analyze text, establish relationships between concepts, highlight new semantic information and material necessary for study, skillful use of infocommunication systems, technical and information teaching aids.

Of course, all components of compressive learning are interconnected and influence each other. A necessary condition for logical and meaningful memorization is understanding. The understood material is remembered better, quickly and for a long time, as meaningful associations are established with existing knowledge. Meaningful memorization occurs by reducing the amount of information using its "filtering," as a result of which truly new and important facts are highlighted in the material proposed for study. Semantic memorization is more economical, capacious, and productive. Thus, improving memorization is facilitated by translating the content of the memorized material when reading into the language of one's own thoughts. Associations are established with material previously acquired as a result of life experience. Moreover, it is not so much the information that is remembered as the thoughts that are associated with it. The development of intellectual abilities, as already noted, is based on the development of attention, memory, and thinking. The comprehensiveness of the approach to the development of intellectual abilities is precisely ensured by the compressive learning technique. The new compressive teaching methodology promotes the development of cognitive interest in children, teaches them to systematize and generalize the material being studied, discuss and debate. Undoubtedly, the new technique has an advantage over traditional ones,

After all, it contributes to the diversified development of the child, teaches him independence in cognition and decision-making.

Each of these components requires special attention, and the student must be prepared for each of them. At first glance, the additional time spent on developing memory, developing reading speed, the ability to analyze text, and reason logically may seem pointless, but they more than pay off in the next stages of mastering the educational material. This was shown by an experiment conducted in grades 4 and 5.

REFERENCES

1. Добрица В.П., Садыкова А.Ж. К вопросу о необходимости компрессивных методов обучения // Качество школьного образования: состояние, тенденции и перспективы: материалы междунар. науч.-практич. конф. (18-19 мая 2000 г.). Ч. 2 / МОН РК, КАО им. Алтынсарина, ИОО. Алматы, 2000. С. 34-36.

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2. Добрица В.П., Матвеева И.С., Захарова Е.С. Информационные технологии как условие реализации компрессивного обучения // Вестник МГПУ. Серия Информатика и информатизация образования. 2008. № 16. С. 82-86.
3. Добрица В.П., Левкова Е.С., Добрица И.С. Подготовка младших школьников к компрессивному обучению // Современные проблемы качества математического образования: теория, методика, опыт: материалы междунар. науч.-практич. конф., посвящ. 75-летнему юбилею докт. пед. наук, профессора Каиржана Габдулловича Кожабаева (28-29 июня 2013 г.). Казахстан, г. Кокшетау, 2013. С. 5-9.
4. Добрица В. П., Добрица И. С., Левкова Е. С. Компрессивное обучение и подготовка к нему младших школьников // Вестник КазНПУ им. Абая. 2014 № 2. С. 73-78.
5. Добрица В.П,, Добрица И.С. Компрессивное обучение и ментальная арифметика // Современные математическое образование: опыт, проблемы, перспективы: материалы междунар. науч.-практич. конф., посвящ. 80-летнему юбилею докт. пед. наук, профессора Каиржана Габдулловича Кожабаева, Казахстан, Кокшетау, 8 июня 2018. С. 265-270.