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TEACHING PROGRAMMING ELEMENTS TO CHILDREN

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ABSTRACT

This article examines the role of programming in the information society and what aspects of cognitive processes were focused on when preparing preschool children for programming. Preparing children for programming implies conducting in the form of the basics of programming, that is, algorithmization.In the study of algorithmization, there are two aspects: developmental and programming. The developmental aspect is associated with the need to develop algorithmic thinking of students in the form of the necessary quality of the personality of a modern person. It is more effective if the development of algorithmic thinking begins earlier. Since preschool children do not know how to write and read, the preparation of preschool children for programming involves the first developmental aspect, namely the process that forms and develops algorithmic thinking.

Keywords*: programming, preschool children, algorithmic thinking, visual-imaginative thinking, substructures of visual-imaginative thinking.*

INTRODUCTION

The rapid development of digital technologies led to the information revolution that shaped the information society. This modern society is leading to an increase in the number of people involved in the production of Information Technology and information products and services. Thanks to the informatization of society, new professions appear in the modern world, and some are disappearing.

What knowledge, skills and abilities should be acquired as a specialist in the digital world? What knowledge and skills should our children have in the future so that they can find their place in the digital world? Among the knowledge and skills in acquiring future 60% of professions in the analysis of Atlas new professions research, the most demanding is the creation of programs for IT solutions. Hence, it is a requirement of the time for children to have knowledge and skills in programming so that they can meet the requirements of the digital world in the future and master the professions of the future.

Programming is a high-level mental foality in building programs that are essential for a computer. Programmer activity requires a high level of intelligence.

A high level of intelligence is not an innate ability. Its education throughout life is formed through upbringing.A genetic predisposition to its development is a favorable basis. Psychologist According to R.Nemov, all abilities go through a number of stages in their development, and in order for it to rise to a higher level in development, the stage before it must be sufficiently formed.

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Fig 1 Young programmers

In a high level of mental development, it is necessary to pay attention to the development of cognitive abilities at the previous stage. Therefore, the training of intelligent programmers with high intelligence indicates that it should start from the previous initial stages. Since cognitive abilities begin to form and develop in preschool age, programming and preparation for it can be started at this age.

MATERIALS AND METHODS

The issue that we are trying to solve is both the preparation of preschool children for programming. When we studied the scientific research work carried out in the field of education in the world on this issue, we saw that programming in developed countries began at kindergarten age. Scientific research work is being carried out on the establishment of Education, which provides primary information of algorithmization of the basics of programming for children of kindergarten age. Programming is carried out in connection with the direction of robotics in the issuance of initial receipts. In this regard, games have been created for children of kindergarten age, and they are created in the form of games and computer games on the table, as well as computer games can be played on-line and of-line. The most common from such games are ScratchJN, LOGO(Massachusetts Institute of Technology, USA), PiktoMir(Russian Scientific Research Institute), BeeBot and others.In some of these studies, programming aims to study how cognitive processes are taking place in children. Studies show that the stages of development of children's cognitive processes, it is emphasized that they are the main factor in the study of their knowledge in programming.

In our scientific work, we set the goal of implementation by developing algorithmic thinking of children in the preparation of preschool children for programming.

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develop algorithmic thinking of students in the form of the necessary quality of the personality of a modern person. It is more effective if the development of algorithmic thinking begins earlier. Since preschool children do not know how to write and read, the preparation of preschool children for programming involves the first developmental aspect, namely the process that forms and develops algorithmic thinking.

Algorithmic thinking or thinking is a special way of thinking based on the technology of step - by-step solution of an issue with a finite number of steps. The role of algorithmic thinking is much more significant than "technological" knowledge: it is necessary for every modern educated person and has a general cultural, educational, and universal value.

Algorithmic thinking is a combination of thought processes and techniques that lead to problem solving when performing a step-by-step and sequence instruction that creates an algorithm. This method of thinking requires formality, logic, accuracy, based on the peculiarities of the algorithm. The presence of logical and algorithmic thinking helps to successfully learn programming.

Advanced algorithmic thinking is a prerequisite for the ability to create applications for digital devices. Those who do not have such a mindset, it will be almost useless for them to know one or more languages (programming languages).

To develop children's algorithmic thinking, it is necessary to have an idea of The thinking itself. Thinking is a generalized and mediated form of mental thinking that establishes communication and relationships between objects of knowledge.

In psychology, types of thinking are divided into subject-action, visual-figurative and verbal-logical thinking, according to the content of the problem being solved. Subject-action and visual-figurative thinking develops in close connection with the formation of logical thinking, the foundations of which are laid at preschool age.

The better and more fully the possibilities of this age period are used, the better the elementary forms of subject-action and visual-figurative thinking of the child are developed, the easier it is to switch to more complex forms of thinking, including logical, conceptual thinking.

As cognitive processes in children develop along with psychic processes, it is necessary to consider the psychological aspects of child preparation. In many psychological and pedagogical literature you can find a lot of information on the development of children's mental abilities.But the ability to know cannot be developed blindly. Because the assignments we give to children can interfere with the development of other psychic processes. Therefore, it is required to know the sequence and main stages of the formation of work-vision and cognitive abilities, relying on a scientific basis.

When solving our issue on the formation of algorithmic thinking, we are guided by the psychologist I. Ya. We are working with reference to the basis of Kaplunovich's scientific research.

When studying various subjects or their images, the child determines certain relationships in them, depending on which of the substructures of figurative thinking is dominant (basic, dominant, more developed, often used). In general, this type of thinking represents five overlapping substructures.

There are the following substructures of figurative thinking: topological, projective, ordered, metric, Composite (algebraic).

According to kaplunovich, in children under three years of age – a topological substructure appears, in which the child, first of all, characterizes such an object as continuous-facing, connected-unrelated , compact–spreading, relevant–non-relevant, and determines the areas of intersection and connection of spatial forms. Children with a developed topological substructure do not like to rush. They try not to skip a single step and perform each action exactly.

Those who dominate the projective substructure, which is four years old, provide the ability to recognize, create, Express, use and move visual objects or their graphic images from any point at different angles. Children with this substructure see the drawings from a different angle, i.e. from a different angle.

Those who have an ordered substructure like to compare and evaluate in children (which appear after five years) in the form of a common quality. The child determines the characteristics, defines and classifies the relationship according to its various characteristics: size, distance, shape, position in space, nature of movement, temporal spatial representations, etc. These children act in a logical, consistent order. Working on the algorithm is their favorite activity. This substructure can be considered the basis of logical and algorithmic thinking.

Children with a compositional (or algebraic) substructure that appears in children after the age of six are constantly striving for various combinations and manipulations, separating additional parts and collecting them into one whole, reducing ("falling") and replacing several conversions. They are very hasty, do not like to explain in detail all the steps of the solution, think quickly and draw conclusions, so they often make mistakes.

CONCLUSION

Each substructure develops with age, step by step and in turn. With the help of various games, it is possible to have a high level of mental potential by developing each substructure

A good development of a topological substructure in the figurative thinking of a child contributes to the formation of other substructures and contributes to the further development of mental abilities. It is this substructure that responds to the ability to analyze, substantiate one's own conclusions, think and draw conclusions. This substructure forms the ability of children to act step by step, consistently, without interruption.

Well-developed figurative thinking leads to the development of logical thinking, which is necessary for the development of algorithmic thinking. It can also be assumed that special attention to the development of a topological and ordered substructure develops in children the ability to think differently with formality, logic, accuracy and the ability to bring any abstract idea into a sequence.

REFERENCES

1. https://spravochnick.ru/psihologiya/psihicheskie_svoystva_lichnosti/razvitie_sposobnosteу.

2. Amanda Strawhacker, Marina Umaschi Bers. What they learn when they learn coding: investigating cognitive domains and computer programming knowledge in young children.

Educational Technology Research and Development (2019) 67:541–575, 568P.
3. Raximovna A. Z., Yunusovna J. N., Yunusalievna J. U. Task Cauchy and Carleman Function //Texas Journal of Multidisciplinary Studies. – 2021. – T. 1. – №. 1. – C. 228-231.
4. Raximovna A. Z., Yunusovna J. N. Some Estimates For The Carleman Function //The American Journal of Applied sciences. – 2021. – T. 3. – №. 06. – C. 77-81.
5. Yunusovna J. N., Juraeva A. Z. R., Yunusalievna U. Growing polyharmonic functions and the Cauchy problem //Journal of Critical Reviews. – 2020. – T. 7. – №. 7. – C. 371-378.
6. Khilola Yokubjanovna Najmiddinova. (2021). INFLUENCE OF FAMILY ON THE DEVELOPMENT OF MATHEMATICAL LITERACY OF CHILDREN. Archive of Conferences, 13(1), 120-128. Retrieved from https://www.conferencepublication.com/index.php/aoc/article/view/575
7. Najmiddinova K. Y. DIGITAL ECONOMY MATHEMATICAL EDUCATION //Scientific Bulletin of Namangan State University. – 2021. – T. 2. – №. 2. – C. 440-445.