

THE MAIN FEATURES OF DEVELOPING LOGICAL THINKING OF STUDENTS IN CONDITIONS OF EDUCATION DIGITALIZATION

The article is devoted to research of the actual problem of developing the logical thinking of students in conditions of the education digitalization.

The aim of the research is analysis of the problem of developing the logical thinking of students in a modern education and search of the ways of development of logical thinking using digital technologies.

The main tasks of the research are following:

- to analyze the role and the place of the logical thinking in a digital society;
- to analyze the foreign and Ukrainian digital educational resources which could be used for the development of logical thinking of all ages children;
- to separate the digital educational resources that could be used in the educational process, in particular for the study of mathematics and computer science;
- to analyze the possibilities of creating logical tasks using digital technologies.

The place and the role of the logical thinking in the context of education digitalization are investigated and it is established that the logical thinking is very important in the system of the competence approach to study in New Ukrainian School. The logical thinking is one of the basic skills needed for the formation of key competences of a person living in the 21st century, in particular for mathematical and information-digital competencies.

The relevance of the problem of developing the logical thinking of students in a digital society is caused by a few reasons as follow: ability of students to access, separate and analyze information from media and social networks; the need to transform the old and create the new ways of organizing learning activities; ability to generate new ideas; the need to modernization of the interaction between the teacher and students as the basis of the educational process; the need to develop a

pedagogical system for the formation of mathematical and information-digital competence of student.

It is established that the logical thinking is very important also for developing the critical and the creative thinking which are ones of the basic skills of a person in a digital society.

Taking into account the openness of the modern information environment, the possibilities of using open educational resources for developing the logical thinking of students are proposed. The overview of open e-learning resources for developing logical thinking of children and adults is presented. The main characteristics of such educational platform as MentalUP Educational Games (<https://www.mentalup.com>), B-Trainika (<https://b-trainika.com/>), 4Brain (<https://4brain.ru/logika/>), LogicLike (<https://logiclike.com/>) are given. It is noted that a part of many different popular digital resources are devoted to the logical thinking. For example, there are the tasks for developing the non-standard thinking (<https://newtonew.com/>), logical puzzles (<http://zagadki.org.ua/>), interesting puzzles (<http://formula.co.ua/>, section "Interesting"), Lifehacks from an expert in logical thinking training (https://www.creativeschool.com.ua/logical_thinking/). The use of game-based educational platform for developing the logical thinking is proposed, for example, such as Code.Org (<https://code.org/>), TouchDevelop (www.touchdevelop.com), Mind Stick (<https://mindsticks.com/game>), Get the Math (<https://www.thirteen.org/get-the-math/>). The resources listed above can be used for developing non-standard training or extracurricular work.

The solving the mathematical tasks is considered as one of the main skills needed for developing the logical thinking of students. So, there are given the overview of open educational resources which are developed corresponding to the Ukrainian and International education standards. The main of them are analyzed, for example, Prodigy (<https://www.prodigygame.com/blog/>), Math is Fun (<https://www.mathsisfun.com/>), IXL (<https://www.ixl.com/>), and Learning.ua (<https://learning.ua/>). Such digital educational resources are appropriate to use in the educational process.

Attention is also drawn to resources that not only contain interactive logical tasks, but also could be used to develop new ones. For example, this is the world-famous LearningApps resource (<https://learningapps.org/>), which contains many templates for designing learning tasks, including logic.

The example of the logic task using both of LearninApps and Rebus (<http://rebus1.com/ua/>) is represented. It is noted that these services have powerful functionality for developing a variety of logical tasks, which will be a great tool for a creative educator. But the development of electronic educational resources for the logical thinking is a separate problem that is not considered in the article in more details.

There are given outlines prospects for further research in this area, which consist in a detailed analysis of the features of the process of developing digital educational resources and investigating ways of creating digital educational resources by modern creative educators for the development of logical and creative thinking of students.