THE USE OF DIDACTIC-SOFTWARE CROSSWORDS IN MATHEMATICS LESSONS

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ABSTRACT

This article argues that the rapid development of science and technology because of the intellectual thinking of humanity is one of the key factors in the development of society. There are discussions about the importance of using e-learning resources and multimedia interactive didactic-software tools in developing students' logical thinking, improving the quality and effectiveness of teaching. The use of didactic- software crossword puzzles plays an important role in shaping students' independent thinking, enriching their vocabulary, expanding their worldview and improving their grammar. The use of didactic-software crosswords encourages the reader to work independently with textbooks and additional literature. Ultimately, it will improve the quality and effectiveness of education, as well as develop students' interest in mathematics and computer science. It also facilitates the teacher's hard work in determining the level of knowledge of students.

Keywords: Technology, development, multimedia, didactic-software, quality, effectiveness.

INTRODUCTION

In the process of globalization, the intensive development of science and technology pays great attention to the widespread use of modern information technologies in all areas of social development.

At the current stage of educational reforms and large-scale transformation processes that our country is undergoing, applying modern pedagogical methods and technologies of education into practice is playing more and more significant role.[4]

Therefore, it is advisable to use modern information technology in education, pedagogical and didactic software, new pedagogical and innovative technologies.
The National Encyclopedia of Uzbekistan describes the term "innovation" as follows.
1) Investment in the economy to ensure the replacement of generations of equipment and technologies;
2) Innovations in areas such as technology, technology, management and labor organization, based on scientific and technological achievements and best practices, as well as their application in various fields and fields of activity "[1. p.199].

Improving the quality and effectiveness of training using innovative technologies in the educational process, developing students' interest in science and developing independent work skills can be achieved by introducing innovations and changes in the activities of teachers and students.
President of Uzbekistan Shavkat Mirziyoyev in his address to the parliament on January 24 proposed declaring 2020 the "Year of the development of science, education and the digital economy.

"Shavkat Mirziyoyev emphasized the importance of scientific and technological development: "Today, information technologies are being introduced in all regions of the world. We are still behind. "We need to accelerate our efforts to further develop science in our country in order to provide young people with deep knowledge, high spirituality and culture, as well as create a competitive economy."

METHODOLOGY
In fact, digital technology not only improves the quality of products and services, but also reduces costs, is an effective tool for the development of people's well-being, prosperity and strengthening the country's position in the international community.

Thus, it is desirable to develop students' mathematical thinking, broaden their horizons, develop logical and independent thinking, and use multimedia interactive crossword puzzles from elementary school.

Crossword is one of the most popular word games in many countries of the world for developing a person's ability to think, expanding his horizons, strengthening his memory and developing grammatical literacy.[3]

Of course, to create crosswords, you can use the following programs:
- Microsoft Paint;
- Microsoft Word;
- Microsoft Power Point;
- Microsoft Excel;
- VBA program;
- Didactic-software tools created using compilation languages;

In my teaching, I use didactic crossword puzzles that I created in the Visual Basic and Vb.net programming languages to improve the quality and effectiveness of learning, as well as help students develop logical and independent thinking. (Figure 1)
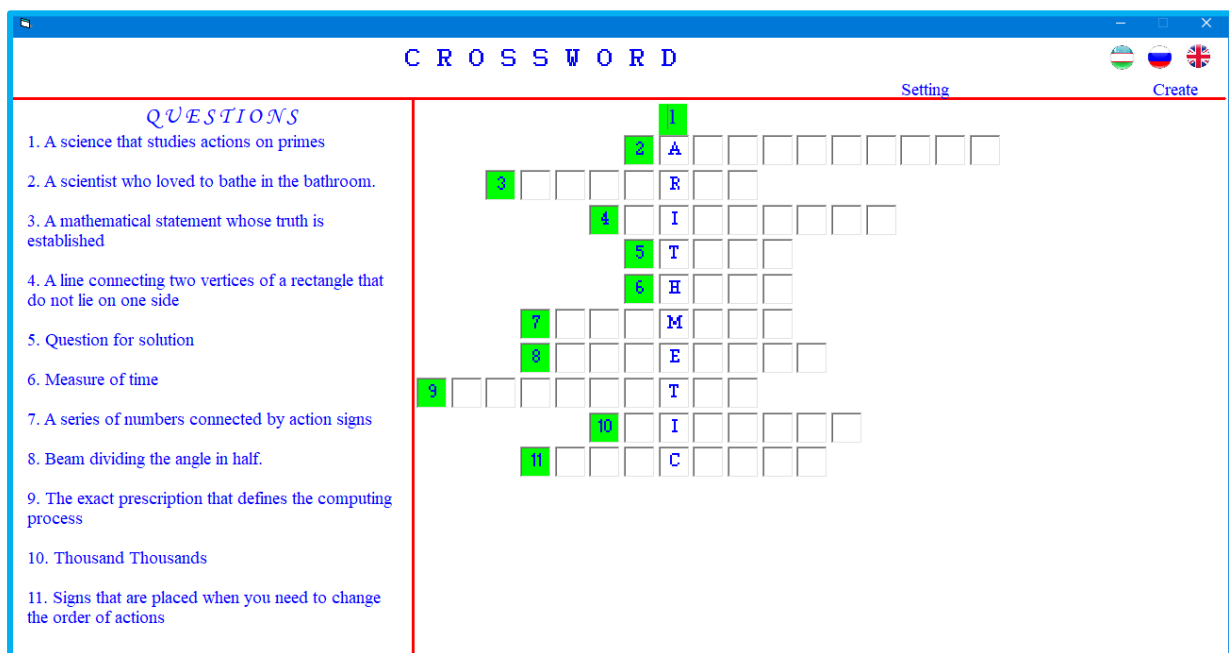

Figure 1. Interface of crossword

This didactic-software tool allows you to create and use an unlimited number of crosswords for a number of questions, difficulty levels, for each topic, section or the whole course, taking into account the individual characteristics of the student. The program can be used in two ways:

1) Computer version;

2) Paper version;

To do this, left-click on the "Setting" button in the program interface. As a result, the "Setting" window will open, which allows you to specify the following.(Figure 2)
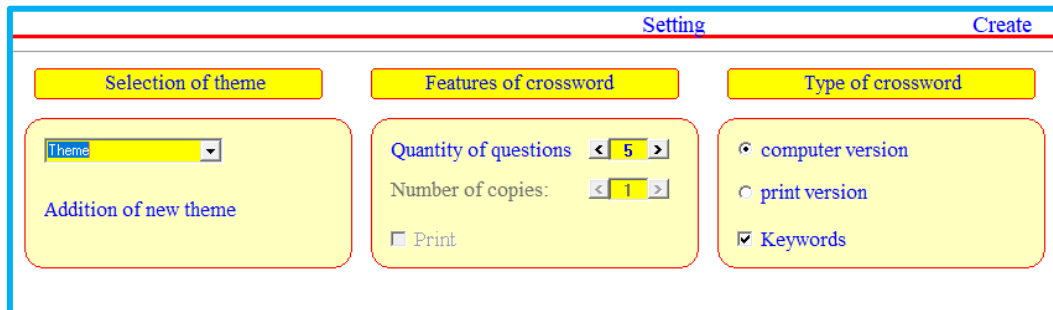

Figure 2. Setting of crossword

- Crossword puzzle theme;

- The number of questions in the crossword puzzle;

- Computer version of the crossword puzzle;

- The presence or absence of a keyword;

1) When creating a crossword puzzle in the computer version, he even checks and evaluates the letters in the words of the crossword puzzle on the computer. If you count the number of incorrect attempts during the crossword puzzle, one point is removed for every five incorrect attempts. (Figure 2)
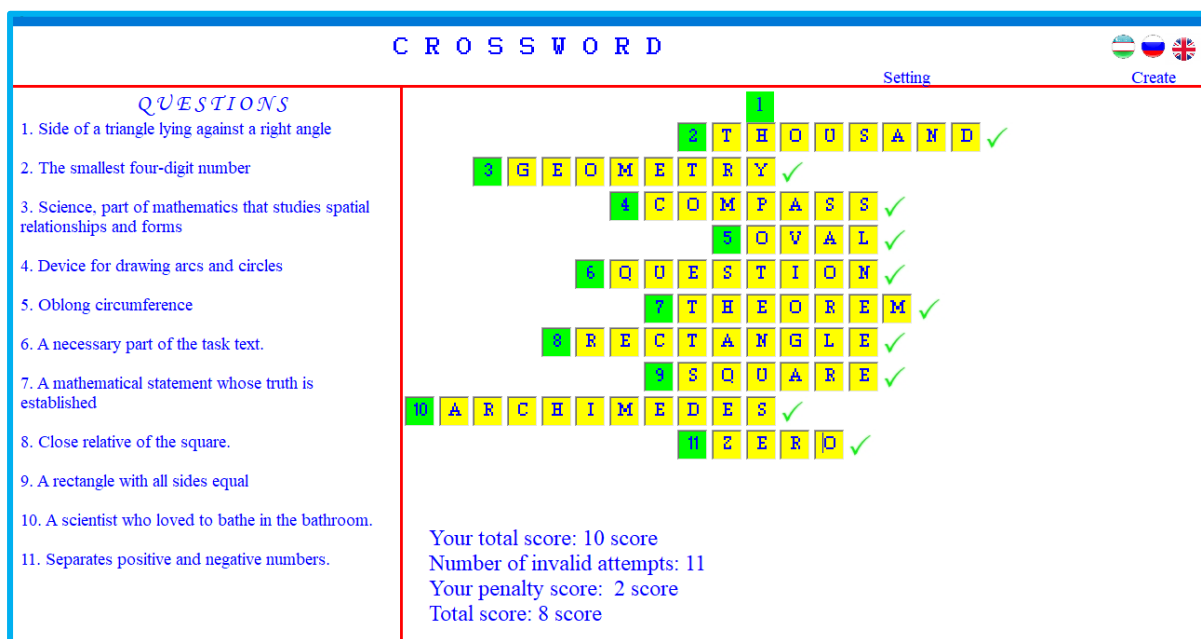

Figure 2: Evaluation of a crossword puzzle with a computer version

2) If you selected the paper version of the crossword puzzle, determine the crossword theme and the number of questions in the crossword puzzle and click the "Create" button in the program interface, then print the indicated number of crosswords. For example: open the "Settings" window of the program and perform its parameters as follows. (Figure 4)

Figure 4. Window of setting

As a result, two different types of crosswords are printed on paper, such as the following crosswords (Figure 5 and Figure 6).

Figure 5. Crossword 1

Figure 6. Crossword 2

It also allows you to check the crosswords printed on paper, comparing them with the answers. Of course, such an opportunity of the didactic program facilitates the hard work of the teacher and saves time.

The use of numerical crossword puzzles in math lessons encourages students to form independent work and develop mathematical thinking.
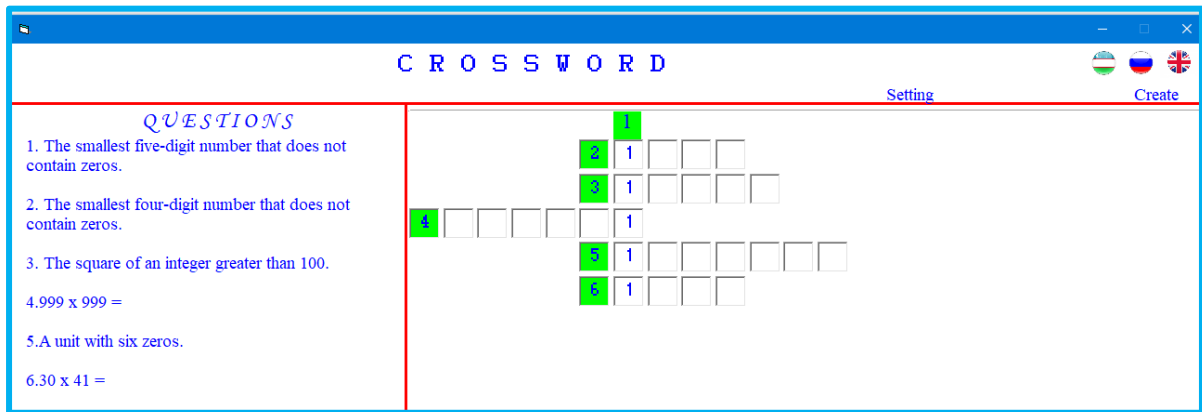
Figure 7. The numeric crossword

In mathematics lessons, it is advisable to do numeric crossword puzzles using the computer version of the program.
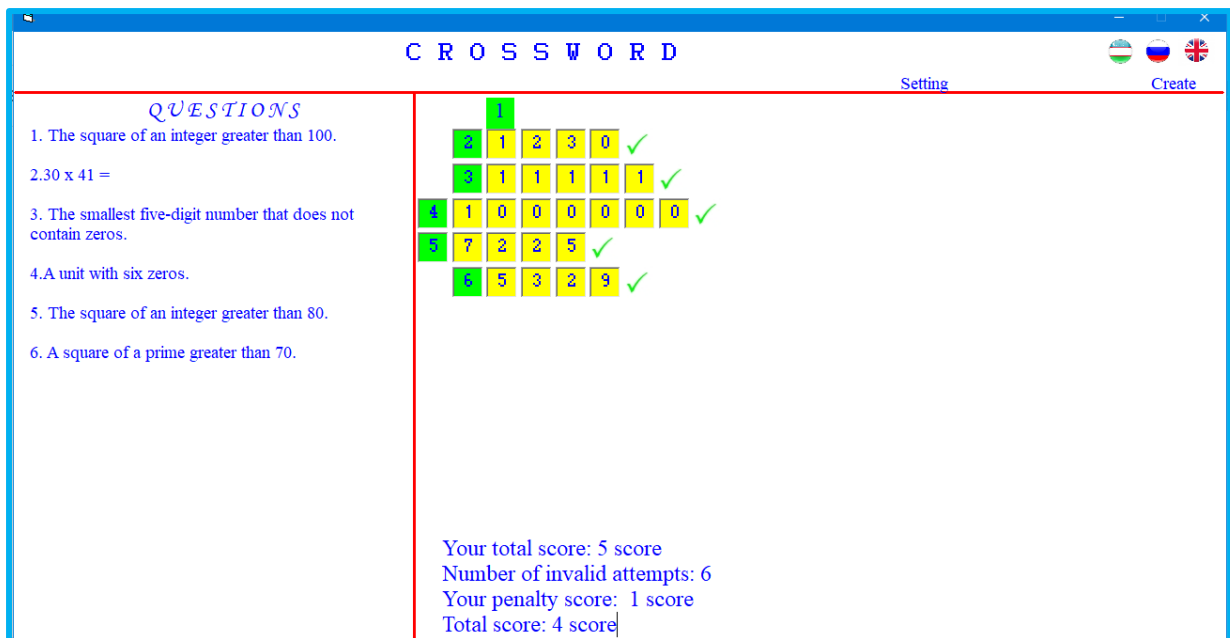

Figure 7. The numeric crossword

RESULTS

According to the current system of knowledge assessment, when solving crosswords it is rational to use such a scale [2] (Table 1):

Rating	The number of correct answers	Recommendations
2	up to 50%	Your result is weak and mediocre. This indicates a limited range of interests. Spend more time not only studying the school textbook, but also reading non-fiction. Train your memory.
3	50-69 %	The circle of your knowledge in the field of mathematics is small. Your reading of a textbook and popular science literature is superficial. You need to pay more attention to the study of mathematics as a subject.
4	70-94 %	Your result is good. This indicates an interest in mathematics. You know how to concentrate on individual issues. You should not reduce the requirements for your studies and train your mind.

5	95-100 %	Your circle of knowledge in the field of mathematics is excellent, speaking not only of a good memory, but also of great curiosity. Advice one: "Keep it up!"

Table 1

Practice has shown that presenting students with an educational crossword puzzle, it is necessary to observe a number of conditions:
1) The availability of the crossword puzzle is checked in advance;
2) There are objective incentives (motives) that encourage students to work for the best end result;
3) The atmosphere of a natural game situation was created in the lesson;
4) Only positive emotions of students are provided when working with crosswords;
5) An element of competition between students was introduced into the course of the decision;
6) Discussion of answers to the questions of the crossword puzzle, their clarification, and in case of disagreement of opinions, discussion is provided.

So that the children do not lose interest in solving crossword puzzles, it is necessary to diversify their content and presentation form.

CONCLUSIONS

Crossword is the most common word game in the world. There are a huge number of crosswords that are classified by the features of the playing field, by the features of the filling, by the features of the questions, by the content. Moreover, there are crossword puzzles containing simultaneously signs of several groups. Algorithms designed primarily for creating crosswords in Microsoft Paint, Microsoft Word, Microsoft PowerPoint, Microsoft Excel, HotPotato and didactic programs created in programming languages can be used to make teachers and students more familiar with crossword puzzles.
Thus, the main goal of our article is to create crosswords in different programs and use them effectively in lessons.

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