

Part-4



**International Scientific and
Practical conference "Actual
Issues of Science"**





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DEVELOPMENT OF AN ELECTRONIC MANUAL FOR GRADES 5-6 ON CREATING APPLICATIONS IN THE SCRATCH PROGRAMMING ENVIRONMENT.

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Abstract: *The article discusses Currently, society needs open people who are able to communicate and interact with the outside world, people who are able to have a holistic view of the world and its informational unity. Therefore, it is very important in the development and education of children to instill in them the ability to navigate in a huge information flow, the ability to allocate and collect only the necessary information, draw conclusions and conclusions, as well as the ability to work with information, use new information technologies.*

Keywords: *algorithms, knowledge, education, functionality, rope, software products, Scratch programming, allocate and collect, development.*

As Apple founder Steve Jobs said, everyone should learn computer programming, because it will teach you to think [34]. When you ask a child: “Who do you want to become when you grow up?” - the answers are completely different, but you will never hear from a child: “I want to become a programmer,” moreover, many do not even know what it is.

Our world is developing very much in the IT industry, technologies are growing, humanity is becoming informational, which indicates the onset of a new phase of human development, where a person thinks and a machine works. Nowadays, almost everything is more or less the result of programming.

All programming languages can be divided into two types: text and visual. Text programming languages are languages entered from the keyboard, output as text files. Graphical or visual programming languages are languages that rely on drag and drop rather than input and command knowledge.

Commands usually look like labels, buttons, pictures with text labels. When teaching young children, it is more expedient to start studying the visual programming environment, and then move on to text.

Traditional programming languages such as Pascal, Java, C++, Delphi and others are difficult for children to learn. Scratch is designed to change that. When studying algorithmization and programming, it is not enough to show and explain the work of various conditions, cycles, variables. It is necessary to teach students to think critically, to understand the essence of algorithms. Students should visually and visually see the results of their actions and Scratch how one of the visually event-oriented programming environments solves these problems. Scratch is a tool for creativity, where the student himself does not notice how he learns programming.

It is advisable to compare Scratch with other projects on the software market. There is no need to consider traditional programming languages, the consequence of this is written above. Let's look at the main features of Scratch programming:

1. Block programming. To program in Scratch, it is necessary to combine graphic blocks together, similar to Lego construction. The blocks are made so that they can be assembled only in syntactically

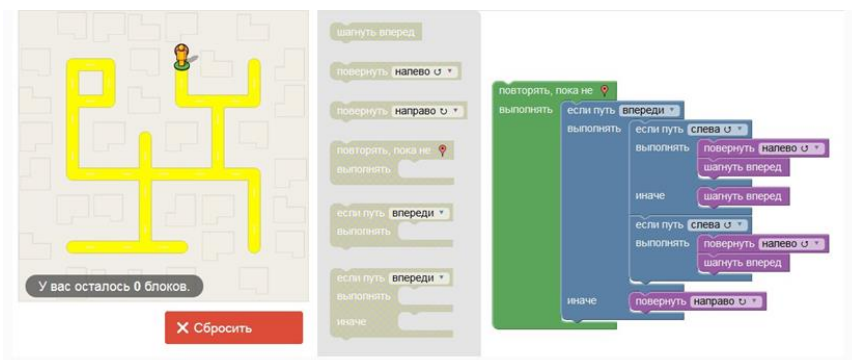
door designs, this eliminates errors. Different data types have different forms, emphasizing incompatibility. You can make changes to the stacks even when the program is running, which allows you to experiment more with new ideas.

2. Data manipulation. With Scratch, you can create programs that control and mix graphics, animations, music and sounds. Scratch expands the visual data management capabilities that are popular in today's culture.

3. Collaboration and exchange. The Scratch project website offers inspiration and an audience: you can view other people's projects, use and modify their pictures and scripts, and add your own project. The biggest achievement is the common environment and culture created around the project itself.

A similar programming environment with an interesting name Blockly, written in the JavaScript programming language, supports the only platform for work - the browser. Blocks includes a graphical editor that allows you to compose programs, as in Scratch from blocks, visually both programming

environments are similar to each other. The functionality and possibilities of expanding and connecting additional blocks are wider in Scratch.



Drawing. 1. Blockly Interface

Kodu was originally named Boku, which was developed by Microsoft back in 2009. Kodu is a game where you can create a game. The advantage of this visual event-oriented programming environment is that it works in 3D models in a 3D world. Kodu runs on Windows XP/Vista platform/7/8/10 and Xbox 360. Just like in Scratch, students will learn not only programming, but also cooperation, logic and creativity.



Drawing. 2. Kodu Interface

Summing up, it is worth noting that each of the listed programming environments has a place to be, but not everything is possible to implement within the educational process and Russian schools. For example, Kodu requires more technical requirements from the computer, the mandatory presence of a good GPU in the system unit. In schools, as a rule, a budget class of computers

is purchased, thereby making the task of installing on personal computers impossible or partially impossible for a laboratory assistant or teacher.

Working on the Internet is more relevant than ever, but having only a web version, as discussed above in the Blockly programming environment, is very limiting, since not all schools are equipped with the Internet.

A visual comparison of the software is shown in Table 1., where it is clear that Scratch is the most relevant.

Table 1.

Software Comparisons for Learning Programming

	Free	Low Techn	Onlin e/Offline	Expan sion	Com mon	Cultur e
Sc	+	+	+	+	+	+
Bl	+	+	-	-	-	-
Ko	+	-	-	-	-	+

Thus, analyzing programming environments, it is not difficult to notice that all of them (programming environments) in computer science and ICT lessons contribute to the development of students' working memory, attention, logic, mathematical knowledge, thinking, and the development of independence. And using effective programming tools in teaching, such as Scratch, which increase the interest and motivation of students, they comprehend the whole technology of problem solving - from problem formulation to presentation of the result.

Scratch has a nice and intuitive user interface. In it, students can fully reveal their creative talents, as in Scratch you can easily create games, presentations, animated postcards, cartoons, training programs, simulators, interactive tests: invent and implement various objects, determine how they look in different conditions, move around the screen, establish a connection between objects; invent stories, draw and animate your fictional characters on the monitor, while mastering graphic and sound information processing technologies, animation technologies, multimedia technologies. Scratch is a whole multimedia system. Basically, all commands in the language are aimed at interacting with graphics and sound, working with animation and effects. A huge number of options for interacting with visual data develop multimedia

skills, facilitate understanding of the principles of algorithm execution and software debugging. Scratch is an environment, scientifically called visually object-oriented, in which blocks with commands are assembled into one, like LEGO (LEGO is a completely new technology in education) [19]. Orientation when working with Scratch on the results of education based on a system-activity approach, which is the basis of the concept of the development of universal learning activities, which are the main concept of the new generation of FGOS and ensure the ability of students to self-development through conscious and active development of new experience. Scratch has two versions offline and online. Interface of the desktop version and online service <https://scratch.mit.edu> / absolutely the same, thus the teacher, depending on the equipment of the class, can choose.

Conclusions: The sphere of human activity in technological terms is currently changing very rapidly, new technologies are quickly replacing existing ones, which the specialist has to master again. The task of a modern school is to ensure the entry of students into the information society, to teach everyone to use information and communication technologies. The formation of user skills for the introduction of a computer into educational activities should be supported by independent creative work that is personally significant for the student. At the same time, it is necessary to create a comfortable educational environment in which the most complete self-realization of the child is possible.

In this regard, it is advisable to introduce the study of a new Scratch technological environment for teaching programming and information technology to schoolchildren from the 5th grade. The environment has a friendly user interface. In it, students can fully reveal their creative talents, since in Scratch you can easily create cartoons, games, animated postcards, presentations, training programs, simulators, interactive tests: invent and implement various objects, determine how they look in different conditions, move around the screen, establish ways of interaction between objects; to compose stories, draw and animate their invented characters on the screen, while mastering graphic and sound information processing technologies, animation technologies, multimedia technologies.

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