

The Strategy Of Training High Level Educational And Practical Skilled Young Information Technology Generation

Khodjayeva Mavluda Sabirovna¹ and Turopova Nilufar Ilkhomovna²

¹Associate Professor of the International Islamic Academy of Uzbekistan, Ph.D.

²Master degree student of the International Islamic Academy of Uzbekistan



Abstract – "Creating the digital industry of the future" requires the launch of the country's digital transformation by increasing the level of development of human capital, the rapid digital transformation of education. At the same time, it will be possible to actively use a research-based approach in the educational process, thereby developing students' skills in research and shaping their creative abilities and creative thinking based on IT competencies. This paper examines the strategy of training high-level IT professionals and its positive aspects of the education system of the younger generation based on kids' programming course experiences and observations.

Keywords – IT, education, programming, development, scratch, code.org.

I. INTRODUCTION

The rapid development in the field of modern technology plays a key role in ensuring that the classrooms in the educational process are well equipped and meet today's requirements. Today's classrooms are very different from a decade ago, and classrooms are being equipped with computers, tablets, smartboards, and other types of educational technology. As in other parts of the world, Uzbekistan has seven generations of digital screens - televisions, computers, tablets, phablets, smartphones, and smartwatches. As a result of having such a dense digital environment and constantly interacting with it, today's students' thinking and information processing processes are radically different from previous thinking and information processes. The digital generation cannot and should not be taught in the style our parents learned. Blackboards and white chalk cannot be used to educate this generation. Changing a blackboard to a whiteboard and chalk to a marker will not change anything, it will not be a way to motivate modern students to learn and develop skills to succeed in the job market.

II. THE RISE OF THE PROBLEM AND IN THE WAY OF IT'S SOLUTION

Programming and IT have become one of the trend areas of the world in today's age of modern science and technology, and these growth rates continue to evolve in the form of geometric progressions. We are on the path of development, which means that our main goal is to educate the new generation with the aspects and skills that meet the requirements of the future. This is because the youth in our country can be more intelligent and practical than any other of their counterparts, but not less. The high places taken in the annual science olympiads are clear proof of our opinion. Despite that, we are still a step away from programming developed countries. Therefore, we started investigating the reasons and possible solutions for this low figure that is seen in our country in the field of IT and Technology.

First of all, when we look at the autobiographies of people who have established a great empire in the IT industry today, we find out why we still don't have enough experts in this field. The result was amazing. For example, Tesla co-founder Elon Musk, who is now an IT superhero, was only 12 years old when he launched his first video game, and Larry Page, one of the founders of the world-famous Google, began learning programming with his mother at the age of 7. In many developed IT countries, programming has become a school subject or has already begun its work as a programming circle in addition to the core subjects.

In developed countries, programming and IT are included in the school curriculum, and in these countries, extracurricular computer science and programming classes for school children have already been launched by non-profit organizations and have achieved great results in this area. For example, U.S. projects such as Code.org, Scratch, Coder Dojo, additional programming circles for grades 5-6 conducted by Massachusetts University students, or Google to support Android developers and nurture young programmers, including visual block programming-based technologies such as App Inventor.

In collaboration with the prestigious PDP Academy, which trains programmers and IT specialists in Uzbekistan, we started a programming course using foreign experience, lesson plans, methodologies, various interactive games, and projects that include basic programming concepts for children aged 9-13. The project "Programming for kids" is developed. The project was based on additional post-class tutorials organized by Andrea Arpachi Dusseau, a professor at the University of Madison in the United States, and coursework by Code.org, a U.S. non-profit organization. According to statistics, the project was launched in 2019 with 8-10 children. Today, the project has more than 20 graduates and now provides programming for Kids to more than 40 children. is studying the field of programming through the project.

The following are examples of programs implemented under the Programming for Kids project:

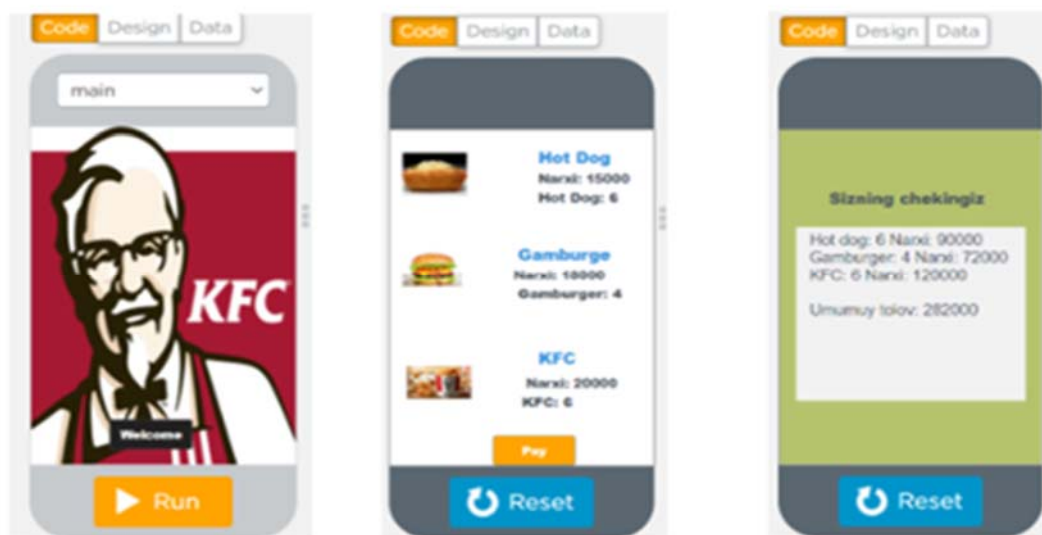


Figure 1: KFC mobile application based on the App Lab project of Code.org technology

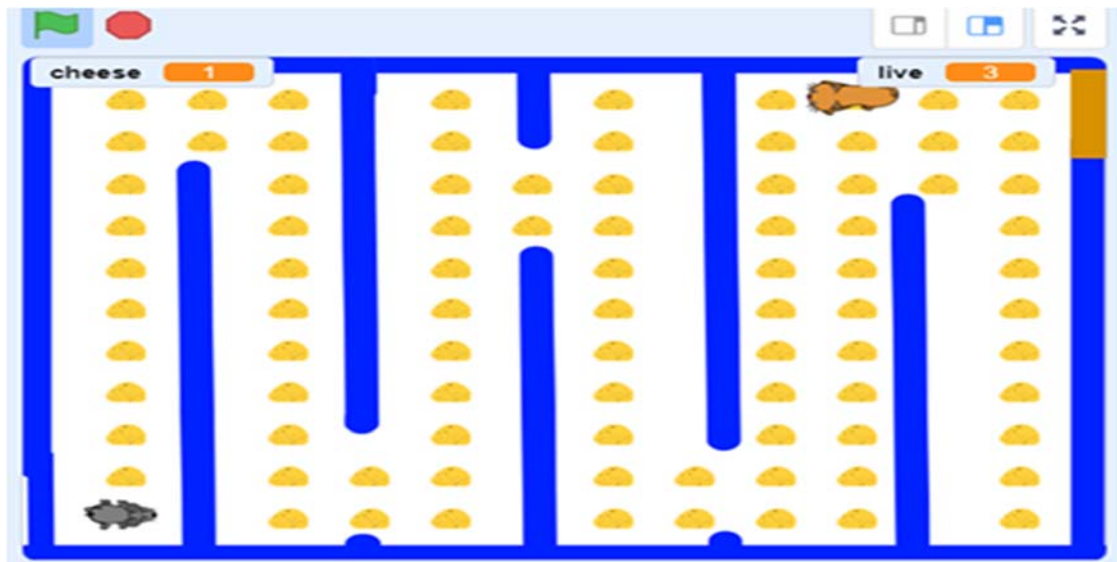


Figure 2: A maze game created using the Scratch programming language

Now, as a logical continuation of the project, taking into account the potential of children, the course "Python Project Development" has been launched. Soon, as the result of gaining successful results from children, we are going to open Frontend Development, Graphic Design, Robotics Lab courses. In the future, this project is seen itself as an IT school.

III. ANALYSES AND RESULTS

During the "Programming for Kids" project, the mental and practical changes that occur in children attending additional extracurricular programming classes were tracked, resulting in a list of the positive aspects of taking an early step into IT for children. In the following list, we will share the results of this project and try to briefly label each of them with specific statistics and analyses:

1. Programming has a positive effect on mental ability

Students in computer science or programming classes are far ahead of their peers in terms of thinking and logical connection of information. In general, parents and teachers of children participating in extracurricular programming circles reported that the child's mastery of other subjects increased by 30%. Every parent who is concerned about their children's learning process and future success should create opportunities for their child to learn computer science and programming.

2. High demand for IT and Programming industry

Informatics is one of the fastest-growing and highest-paid industries in the world. The informatics industry is growing twice as fast as the fastest growing areas around us, and as a result, in the next few years after 2020, the industry alone will create more than 1.4 million new jobs with nearly \$ 500 billion in employment. the industry is expected to expand further. Yes, one of these jobs may belong to your child.

3. Ability to solve problems and think critically

The field of informatics is constantly developing the ability to solve problems in children. They will need to do a lot of research and be critical of the process to find a solution to a particular problem through programming.

4. Development of logical and analytical thinking

The most basic concept when it comes to programming or computer science, in general, is of course logic. If our children are confusing processes in their learning and work activities and have difficulty achieving the expected results, then programming lessons are just the thing. Because it is through programming that they can easily understand that the expected result or success is a well-chosen sequence of actions. In addition, a child who understands the order in which the program code he writes works will

understand how the technology he uses in his daily life will work. This, in turn, is a great logical connection for them to connect as creators of larger technologies.

5. Encouraging creativity in children

Many people consider computer science to be a very boring and difficult field. Computer science is more powerful than many other arts, such as painting, music, poetry, and fiction. In the field of computer science, it is possible to combine all of the above arts. The most interesting thing is that children can create a creative product based on a sequence of commands based on 0 and 1.

6. Understand that mistakes are not a tragic process

While we usually demand perfection from our children, we also press them very hard for trivial mistakes. As a result, children find the concept of error very difficult. This has a significant impact on their developmental stage, such as self-confidence and innovation. A child learning programming can correctly analyze errors in program code, realizing that errors are important in the developmental stage and that errors can sometimes lead to good results.

7. Develop attention and self-confidence

A child learning programming cannot focus on more than one task at a time. Because he knows very well that one small element can ruin an entire head job. That's why he is very careful about his job. Children, who used to love technology, are now starting to focus on the creative part of technology through computer science and programming courses. Now your child will not only play games on the phone but also start thinking about how it is made and how to improve it. In general, this aspect encourages him to develop self-confidence and not be afraid to take risks. Because now he knows exactly what the games his peers are playing without raising their heads. His goals are now clear.

IV. CONCLUSION

In short, the world is changing day by day, and technology, especially digital technology, is evolving so rapidly that we are living in a time when the boundaries between today and the virtual world are disappearing. Of course, as the development of IT technologies develops rapidly, regardless of space and time, we have a better understanding of the importance of programming and IT and its benefits for children. The simplest, most fun, and most interactive way to take kids step-by-step into the IT industry are through projects based on visual programming languages such as Scratch, Code.org, and App Inventor. At the same time, children focus on the creation of various games and stories, as well as the correct analysis of the sequence of processes, visual acquisition of fundamental knowledge and skills in the field of programming.

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