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IMPROVING TEACHING METHODOLOGY BASED ON DIVERSIFICATION OF EDUCATIONAL TECHNOLOGIES BASED ON THE 4C MODEL

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ABSTRACT

This article analyzes the issues of improving teaching methodology through diversification of educational technologies based on the 4C model. It covers the theoretical and practical aspects of integrating modern digital technologies into the educational process, applying innovative pedagogical approaches, and forming students' skills of the 21st century. The article reveals the importance of digital tools and diversified approaches in increasing educational efficiency.

Keywords: 4C model, creativity, critical thinking, communication, collaboration, educational technologies, diversification, digital education, innovative approach, pedagogical methodology, information technologies, interactive education.

INTRODUCTION

In order to train globally competitive personnel, modern information technologies, in particular, diversified educational technologies based on the 4C model, are widely used in the educational process. This approach serves to ensure educational efficiency and implement digital transformation. In particular, leading higher education institutions such as Harvard University (USA), Oxford University (UK), University of Toronto (Canada), National University of Singapore, University of Helsinki (Finland), Technical University of Munich (Germany), University of Amsterdam (Netherlands) are striving to increase the effectiveness of teaching by integrating this model into the educational process. Their research in this area is accelerating digital transformation in education and science.

The task of developing software and methodological support related to the use of the most advanced technologies for the effective organization of the educational process on a global scale, including the diversification of educational technologies based on the 4C model, is an important pedagogical problem. Solving this problem requires not only organizational efforts from teachers to use information technologies in pedagogical activities, but also strategies for introducing new methods into the educational process, research and methodological work on their implementation by higher educational institutions. In this regard, there is a need to improve teaching methods based on the diversification of educational technologies based on the 4C model.

Analysis of scientific work on the successful implementation of the 4C model in the educational process shows that research on the use of this model in improving teaching methods, blended learning strategies, and the use of digital technologies in education was conducted by A.A. Abdukodirov, M.M. Aripov, U.Sh. Begimkulov, Sh.B. Bekchonova on the application of information and communication technologies in the process of training future specialists in higher educational institutions of our republic, while scientists such as D. Tukhtamishev, N.A. Mirzaahmedova, O. Yuldoshev, D.M. Ormonova, and A. Tursunov conducted scientific research on the application and effectiveness of the 4C model in education.

Among foreign scientists, C.Goh and M.Johnson conducted research on the successful implementation of the 4C model in collaborative learning, while D.Shin and J.Kim conducted research on the implementation of the 4C model in the process of teaching STEM subjects and enhancing student activity. R.Schmid and T.Franke studied the impact of the 4C model on the development of creativity and collaboration. M.Lemos and J.O'Neill analyzed the application of the 4C model in the diversification of educational technologies.

Studies conducted in Uzbekistan comprehensively analyze the implementation of the 4C model in the higher education system and the use of digital technologies in the teaching process. The study conducted by Tukhtamyshev is devoted to the study of methods aimed at developing students' creative thinking skills and teamwork during the implementation of the 4C model in higher educational institutions of Uzbekistan [1]. This study examines the elements of creativity and collaboration, specifically how they can be used to effectively develop students' skills through interactive learning tools [2].

When we look at the elements of the 4C Model, we can see that each has its own unique characteristics. These include:

Creativity: This element develops students' creative thinking skills and encourages them to find new solutions to problems. Creativity enhances students' ability to apply knowledge in different ways in the learning process, which further enriches teaching methods [3]. Robinson in his study considers creativity as an integral part of education and emphasizes the need to create an environment for students to develop a creative approach [4]. Mishra and Koehler talk about combining educational technologies with creativity, thereby increasing the opportunities for students to develop various skills. Creativity helps to maximize students' creative potential [5].

Critical thinking: Critical thinking increases students' ability to think independently and analyze problems in different situations. The 4C model places great importance on developing critical thinking, as it strengthens students' ability to analyze ideas deeply and logically [6]. Critical thinking in education encourages students to think independently and analyze problems deeply in different situations. Ennis calls critical thinking an integral part of education and emphasizes that with its help, students will be able to analyze problems logically and clearly [7]. Thus, critical thinking plays an important role not only in solving specific problems, but also in understanding the world more deeply and making logical decisions. Critical thinking develops students' independent, deep and logical analytical skills. These studies aim to strengthen students' critical approaches, but in our opinion, the use of digital technologies in the process of critical thinking has not been sufficiently studied. The ability to approach questions in a new way and make critical decisions based on information in virtual environments has not been considered. The issue of using critical thinking to solve problems in real time also requires in-depth analysis.

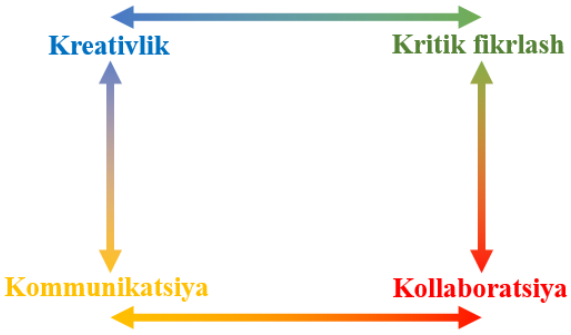
Communication develops students' skills to communicate with each other, to express information clearly and intelligibly by organizing effective dialogue in the educational process. H. Kim in his study, paying special attention to the communication element of the 4C model,

emphasizes that the use of interactive teaching methods and technologies can increase students' ability to exchange ideas and collaborate [8]. Effective dialogue ensures the active participation of students in the lesson and deepens their learning process [69].

Collaboration encourages students to work together in the learning process, which in turn helps to find new solutions to problems. Lemos and O'Neill's study found that students' knowledge sharing through teamwork has a positive impact on their learning outcomes [9]. A. Johnson also highlighted the role of collaboration in strengthening cooperation between students and developing social and cognitive skills [10]. Slavin demonstrated the effectiveness of mutual assistance and exchange of experiences between students through team learning methods [11].

Supporting the research of the above-mentioned researchers, we believe that the role of teachers in teamwork and their strategies for organizing cooperative learning should be studied in more depth. In addition, the positive impact of digital collaboration platforms, such as online team project programs, on student learning has not yet been fully explored. In this regard, our study seeks to shed light on the methods aimed at increasing the effectiveness of teamwork using digital tools.

According to our analysis, this approach helps students effectively apply their knowledge in various areas and engages them in a deeper learning process. In particular, the implementation of the 4C model in information technology is very effective in developing more practical skills, strengthening creative approaches, and improving teamwork skills. The components of the 4C model are complementary and reinforcing elements that work in an interconnected way in the educational process. Their complementary aspects can be explained as follows:



The main components of the 4C model and the relationship between them

1. Creativity and Critical Thinking: While creativity is about finding new and innovative solutions, critical thinking is developed by analyzing these solutions, identifying their strengths and weaknesses. For example, when a student creates a new idea, critical thinking helps to reconsider this idea and assess its validity. Both components rely on each other - creative ideas are put into practice through critical analysis.

2. Communication and Collaboration: Effective communication is essential for the success of cooperative work. Students need to be able to clearly express their ideas and communicate effectively with others when working together (collaboration). This is especially important

when working on team projects or solving problems in groups. Without communication, teamwork can be poor, so these two components complement each other.

3. Creativity and Communication: Creative ideas are enriched by the exchange of ideas. By sharing their ideas with others, students hear new perspectives and refine their creative approaches. Effective communication, in turn, facilitates the exchange of creative ideas.

4. Critical Thinking and Collaboration: Critical thinking is essential in teamwork to evaluate and apply the ideas of others. Critical thinking involves analyzing the ideas of each member of the team and assessing their appropriateness in solving team problems.

The educational process is a constantly changing and developing field, and the need to use new methods and technologies to adapt to the needs of students is becoming increasingly important. With the introduction of innovative approaches to the educational process in the modern world, the diversification of educational technologies has emerged as an area that requires special attention. Today, relying only on traditional teaching methods is not enough, because the modern student feels the need to expand his knowledge with digital technologies and interactive learning tools.

The theoretical foundations and role of the 4C model in education are aimed at enriching the educational process with modern pedagogical approaches and providing students with such important skills as creativity, critical thinking, communication and collaboration. However, for its effective implementation, it is necessary to consider how this model can be applied to educational technologies on the basis of diversification and the possibilities of organizing the educational process more effectively through this. Diversification of educational technologies is the process of enriching the educational process with various technologies and adapting teaching methods to modern demands and needs.

CONCLUSION

The 4C model serves to form students' competencies based on modern requirements by developing creativity, critical thinking, communication and collaboration skills in the educational process. The theoretical foundations of this model prove its applicability at all levels of education and create a scientific basis for the introduction of innovative approaches. The science of information technology, with its practical orientation, creates broad opportunities for the development of the components of the 4C model - creativity, critical thinking, communication and collaboration.

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