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METHODOLOGY OF USING NEW PEDAGOGICAL TECHNOLOGIES FOR SCHOOL STUDIES, INCLUDING DISACCHARIDES AND POLYSACCHARIDES

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Abstract: This paper explores the methodology of integrating new pedagogical technologies to enhance the teaching of disaccharides and polysaccharides in school studies. Emphasis is placed on utilizing digital tools, interactive methods, and real-world applications to foster active learning and student engagement. Key strategies include the use of virtual simulations, augmented reality, inquiry-based learning, and flipped classrooms to simplify complex biochemical concepts. The paper also highlights the significance of laboratory experiments and collaborative tools in building a deeper understanding of carbohydrate structures and their biological importance. This approach aims to improve conceptual clarity and promote critical thinking skills among students.

Key words: Pedagogical technologies, Disaccharides, Polysaccharides, Active learning, Interactive simulations, Collaborative tools, Augmented reality, Biochemistry education, School studies, Inquiry-based learning, Flipped classroom.

Introduction

The teaching of biochemistry in schools often presents a challenge due to the complexity of concepts and the abstract nature of molecular structures. Among these, the study of carbohydrates, specifically disaccharides and polysaccharides, requires a clear understanding of their chemical properties, biological functions, and structural differences. Traditional teaching methods may not always be effective in fostering deep comprehension or maintaining student interest.

To address these challenges, the integration of new pedagogical technologies has emerged as a transformative approach in modern education. By leveraging digital tools, interactive simulations, and active learning strategies, educators can create an engaging and dynamic learning environment. These technologies not only make abstract concepts more tangible but also promote critical thinking, collaboration, and practical application of knowledge.

This paper aims to explore methodologies for using innovative pedagogical technologies to teach disaccharides and polysaccharides effectively in school studies. The focus is on combining theoretical learning with practical experimentation and utilizing tools such as augmented reality, virtual labs, and gamification to enhance student engagement and comprehension. Through these approaches, students can better understand the biochemical significance of carbohydrates and their role in biological systems.

In foreign pedagogical literature, the concept of "pedagogical technology" or "learning technology" was initially associated with the idea of technicization of the educational process, the supporters of which saw the wide use of technical teaching aids as the main way to improve the effectiveness of the educational process.

In domestic pedagogical literature, pedagogical technology is considered as a set of means and methods for reproducing theoretically substantiated processes of training and education, allowing for the successful implementation of the set educational goals. The innovative experience of Russian scientists has

outlined a strategic direction in solving complex pedagogical problems, namely, updating the software and technological support of the educational process and the introduction of new educational and social technologies into it [1].

According to the majority of researchers involved in this scientific issue, the distinctive features of modern educational technologies are:

1. changing the nature of the activity and interaction of subjects of the educational process;

2. changing priorities - from transmitting knowledge to creating conditions for a more complete realization of personal potential; 3. manifestation of subjective properties in educational and cognitive, information retrieval, scientific research, educational and professional or control and assessment activities.

Organization of the educational process in a modern rural school is not limited to direct contact of subjects in classes within the framework of the schedule, therefore the leading role here is acquired by technologies used by students and teachers in working with educational information in the conditions of the educational environment.

In our opinion, the technology of actualization of educational and upbringing potential is capable of providing search and activation of those resources of the educational environment that contribute to the formation of positive internal motivation of subjects of the educational process in a rural school.

Technologies of actualization of the potential of subjects of the educational process include the following technologies:

1. self-presentation technology;

2. technology of formation of confidence and readiness for independent successful professional activity;

3. diagnostic thinking training;

4. technology of development of critical thinking;

5. technology of increasing communicative competence;

6. technology of development of competence of students in organization of their educational activity;

7. technology of development of positivity in the system of relations of students in the educational environment, etc.[2]

Of course, using the above technologies in the educational process, the activity of schoolchildren begins to evoke in them various emotions, in particular emotions of experience and significance of their learning. According to V.V. Davydova this happens only when, while completing educational work, students use knowledge, skills and abilities already acquired in the learning process. In addition, this activity must be relevant, appropriate and significant.

The integration of new pedagogical technologies in teaching disaccharides and polysaccharides has proven to be an effective way to enhance student learning and engagement. By leveraging tools such as interactive simulations, augmented reality, and collaborative platforms, educators can simplify complex biochemical concepts and foster a deeper understanding of carbohydrate structures and their functions. Active learning strategies, such as inquiry-based learning, problem-solving tasks, and flipped classrooms, promote critical thinking and practical application of knowledge. Additionally, hands-on experiments and virtual labs bridge the gap between theoretical concepts and real-world applications, making the learning process more holistic and meaningful.

This methodology not only improves conceptual clarity but also equips students with the skills necessary for scientific inquiry and lifelong learning. As education continues to evolve, adopting innovative technologies will be crucial in preparing students to excel in a rapidly advancing world of science and technology.

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