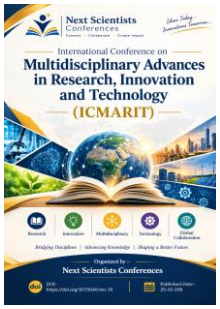
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Didactic Opportunities Of The Dual Education System In Teaching Organic Chemistry

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ABSTRACT

This thesis highlights the didactic possibilities of using the dual education system in teaching organic chemistry, the pedagogical conditions for integrating theoretical knowledge with practical activity, and the development of students' professional competencies. Additionally, the significance of the teaching model based on the cooperation of educational institutions and production organizations in increasing the efficiency of organic chemistry mastery is substantiated.

KEYWORDS: Organic chemistry, dual education, professional competence, practical training, integration of theory and practice, chemical education, laboratory activities.

INTRODUCTION

One of the important tasks facing chemical education today is to develop in students the skills of applying theoretical knowledge in practical situations, analyzing chemical processes, and independently solving problems related to professional activity. Organic chemistry is one of the most important sciences that studies hydrocarbons, oxygen- and nitrogen-containing organic compounds, their structure, properties, production, and application. The theoretical complexity of the subject's content and its inseparable connection with experimental activity necessitate the use of effective pedagogical approaches in its teaching.

From this perspective, the dual education system is one of the promising approaches that serves to ensure the continuity between theoretical knowledge and practical activity in the process of teaching organic chemistry.

Body

Dual education is based on combining theoretical training organized in an educational institution with a production or relevant practical activity environment. The use of this system in teaching organic chemistry allows students not only to theoretically master chemical laws but also to realize their practical significance.

The didactic possibilities of teaching organic chemistry based on dual education can be demonstrated in the following areas:

First, the possibility of integrating theoretical knowledge with practice will expand. For example, in the process of studying the physicochemical properties of organic compounds, students reinforce their theoretical knowledge by performing relevant laboratory experiments, qualitative reactions, and tasks to determine the properties of substances.

Secondly, conditions are created for the formation of professional and practical competencies. Activities such as identifying organic substances, planning chemical

experiments, recording observation results, analyzing obtained data, and drawing conclusions develop students' scientific and practical training.

Thirdly, educational opportunities based on problem-based and professional situations will expand. Students can be given tasks to identify organic substances, compare reaction conditions, analyze factors affecting product yields, and explain the essence of chemical processes in production. Such tasks develop the ability to apply knowledge in practical situations.

Fourth, cooperation between educational institutions and production organizations will be strengthened. Classes organized in cooperation with chemical laboratories, relevant industrial enterprises, and scientific-practical centers can enrich students' understanding of modern chemical technologies, laboratory equipment, and production processes.

Fifth, independent learning and reflective activity are developed. Students actively participate in the educational process by analyzing experimental results, preparing laboratory reports, explaining the causes of identified errors, and evaluating their own performance.

To ensure the effectiveness of dual education, its content must be aligned with the organic chemistry curriculum, a consistent link must be established between theoretical sessions and practical activities, and cooperation with production specialists must be established. Particular attention must also be paid to labor protection, laboratory safety, and compliance with environmental requirements when working with chemicals.

In the methodological improvement of this approach, it is advisable to use problem-based tasks, practical projects, laboratory sessions, modeling of production situations, and competency-based assessment criteria. At the same time, along with students' knowledge, the skills of conducting experiments, the ability to analyze results, compliance with safety regulations, and the level of professional problem-solving must be evaluated.

Conclusion

The use of a dual education system in teaching organic chemistry creates pedagogical opportunities for ensuring the harmony of theoretical knowledge and practical activity, developing students' laboratory skills, and forming their professional competencies. The realization of these opportunities is linked to adapting the content of dual education to the characteristics of the subject, establishing cooperation between educational institutions and production organizations, and developing a system of practical assignments and improving evaluation criteria. Therefore, the scientific and methodological substantiation of the dual approach in organic chemistry education and the verification of its effectiveness through pedagogical experimental work is an urgent scientific and methodological task.

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