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Development of Knowledge in Chemistry in Students and Questions of Vocational Guidance

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Abstract

This article provides materials on the forms and methods of increasing students' interest in chemistry in secondary schools, developing their knowledge and directing them to various professions related to chemistry.

Keywords: *Teaching Chemistry; Increasing Students' Interest in Chemistry; Developing Chemistry Students; Linking Academic and Extracurricular Activities; Career Guidance; Chemical Industry; Polytechnic Education; Role-Playing Games; Chemistry Evenings; Representatives of Various Professions; Interdisciplinary Communication*

Introduction

In the Action Strategy for the Further Development of the Republic of Uzbekistan, the priority is "the development of innovations in education and science, in particular, the systematic implementation of the policy of training qualified personnel, taking into account the modern needs of the labor market." teaching chemistry, it is important to improve the technology of organizing the educational process, methodological support, the system of operational competencies and mechanisms for cyclic diagnostics based on an integrated approach to sending students to professions related to chemistry.

In particular, the Decree of the President of the Republic of Uzbekistan dated August 12, 2020 No. PP-4805 "On measures to improve the quality of continuous education and scientific efficiency in the field of chemistry and biology" and other regulatory legal acts - to exclude the problems raised in this article for implementation and implementation tasks set out in legal documents.

Main Part

In the new edition of the Law of the Republic of Uzbekistan "On Education" much attention is paid to the development of knowledge and outlook of students in the educational process: Therefore, the introduction of developmental education in the learning process is one of the main tasks of the reform.

Developmental education is education that ensures the complete assimilation of knowledge and positively affects the mental development of students. To perform the developmental function of education, it will be necessary to develop a separate methodology for describing the content of chemical education that comes to the mind of each student [6].

There are many reasons to study chemistry. Chemistry is one of the natural sciences required for engineering and scientific research. Chemistry is necessary to understand everything in the world. Chemistry organizes chemical processes, chemical elements and basic laws of chemistry. Preparing students in chemistry is an important task of modern chemistry education.

The main principles of developmental education are as follows.

1. Organize training at a high level of student power;

2. Learning the material as quickly as possible so that students can understand it;

3. Increasing the contribution of theoretical knowledge.

4. Implementation of the conscious development of education.

The development of the mental abilities of students occurs as a result of their active participation in the educational process and the active conduct of the educational process.

The psychological conditions of developmental education include:

1) The use of teaching methods that ensure the conscious acquisition of knowledge in the formation and development of chemical knowledge.

2) To teach students to think logically by comparing, analyzing and synthesizing the properties of matter in the formation and development of intellectual skills.

3) Form and develop logical thinking through problem solving

4) The ability to distinguish and generalize the basics.

The systematic writing of the content of chemistry can also be a means of developing students in the study of chemistry, since it is based on the gradual development of chemical concepts and knowledge, and the activity of the educational process can be a means of development. Systematics will be defined in the curriculum of the school chemistry course and involves raising the level of development of students from class to class, enriching students' ideas about substances and their changes in the following way.

Atomic-molecular theory and ideas about the chemical element of class VII; VIII class for the periodic change of elements and their compounds and the structure of substances and their separation into ions; In the ninth grade, students develop their knowledge and thinking with the help of ideas about the structure of organic substances, their substances, chemical reactions, and important concepts. For example, in class VIII, if chemical reactions are events that lead to the formation of new substances and are divided into classes according to the number of reactants and reaction products, in class VIII, the initial knowledge of redox, irreversibility, ionic reactions are given.

Thus, all sections of chemistry are interconnected by concepts that are integrated and developed into a system.

Generalization is the highest stage of mental activity. Generalizations can be chemical questions related to materials of different subjects, different teaching methods, but the most important generalization among them is the generalization that is made in the independent work of students.

The content of the school chemistry course follows the principle of multiplying theoretical problems. The section "Basic laws of chemical reactions" is included in the VIII class on the topic of generalization of classes of inorganic substances. The section explaining the structure and properties of the factual material "Periodic law and theories of the structure of substances of chemical elements" is taught at the beginning of grade VIII.

In the school course of chemistry there are special generalizing topics. For example, in the 7th grade, the relationships between the classes of inorganic substances are summarized, in the 9th grade of inorganic chemistry, in the 10th grade, the relationships between the classes of organic chemistry are summarized. The content of the study of organic chemistry, composition, structure and properties of carbon and its compounds is reflected in textbooks and manuals. Generalization topics are important in the development of students in inorganic and organic chemistry.

Chemistry teacher needs to develop students' generalization skills. Examples include classes of chemical reactions, basic classification features, genetic relationships between classes of inorganic substances, genetic relationships between organic substances, generalizations of knowledge on each topic.

In addition, tools that enable developmental learning include active learning, problem-based learning, demonstration learning, differentiated learning, and more. The differential approach lies in the fact that each student is given different tasks depending on his specifics and level of knowledge. The level of complexity of questions on a particular topic increases. First, students try to answer more difficult questions.

The implementation of self-study of students is important for the implementation of developmental learning. However, the implementation of self-study of students by traditional teaching methods has become a difficult problem in the modern era, when students can absorb a large amount of scientific information through television and computers.

Recent scientific and methodological research and experience in the implementation of independent education based on innovations and information technologies show that this problem can be solved. For example, on the basis of innovative technologies "Brainstorming", "Announcement Board", "Cluster", "Design" allows students to carry out independent learning.

In the modern era of the rapid development of science and technology, the requirements for the level of knowledge, skills and abilities necessary to master a highly qualified specialty are constantly increasing.

According to psychologists, in order to identify and develop the inclinations and interests of schoolchildren as early as possible, it is possible to orient them to various professions in school and extracurricular activities.

A good way to expand students' knowledge of chemistry and develop their skills and competencies is to start by developing their interest in chemistry. This is done in the following way:

- To increase their interest in science, explain to students the substances with which they are familiar and the chemical processes with which they are associated, when describing each of the topics identified in the program;

- Use visual experience to explain a new topic and reveal its essence;

- Linking the new theme with transitional production;

- Connect the scientific activity of Uzbek chemists with the transition to a new topic;

- Use didactic games to move on and reinforce a new topic.

Solving chemical problems, conducting chemical experiments, solving experimental problems, linking classroom and extracurricular activities, organizing excursions to chemical production enterprises and chemical facilities, allowing students to apply theoretical knowledge in practice to further deepen and develop knowledge of chemistry is over.

The development of students' interest in science is aimed at directing them to various professions related to chemistry.

According to the representatives of pedagogical science, vocational guidance is defined as the work of school teachers, families, pedagogical staff of vocational education institutions, the public in order to make the right choice of future professions in accordance with their knowledge, activities should be understood [3].

Chemistry teachers have a lot of experience in this field. The potential of chemistry in this area is very high, and its study should form chemistry in students not only as a field of natural sciences, but also as a field of practical human activity, according to the school curriculum.

To prepare students for independent choice in the field of chemistry, various forms of career guidance are used. Conducting industrial excursions to chemical and agricultural facilities; preparation and holding of professional evenings, conferences, debates with speeches by leading workers, technicians, engineers; organization of chemical circles; chemical evenings dedicated to the scientific work of chemists, etc. [5].

The following methods can be used in chemistry classes devoted to the study of pure chemistry, silicate, metallurgy, petrochemistry and other industrial chemical industries, including in preparation for industrial excursions or graduation classes [4].

- Establishment of interdisciplinary links of a polytechnic nature;

- Solving problems related to the content of production;

- Reveal the value of the received chemical knowledge in the chemical profession;

- Expand the application of the studied substances, materials, chemical processes, methods of chemical control in various branches of modern production;

- Determine the application of chemical laws and theories in technology;

- To develop in students the ability to apply chemical knowledge in the future and independently acquire new knowledge about the application of chemistry by various specialists.

Role-playing games are an active way of learning with a professional focus. The system of chemical concepts, the studied phenomena and processes are combined with professional activities [7]. Through approbation of the role of specific specialists: technologists, engineers, etc., students learn about the content and significance of the work of chemical specialists.

As a result, intellectual abilities are formed and interest in chemistry increases.

M.K. Kleyankina, E.F. Balashova, O.S. Zaitsev conducts business games, for example, the role-playing game "Ammonia Production" with the director of research institutes, engineers, historians, technologists, heads of environmental departments, heads of security and ecology departments. Such games serve to orient students to chemical professions [6].

Organizing and hosting chemistry nights is important in helping students advance their careers. For example, on the topic "Chemistry and biochemistry of bread" you can see the speeches of various experts at the chemical evening. Tonight will be devoted to the history of bread, its chemical composition, the biochemical deification of nutrients for the body from a biochemical point of view, the dialectical relationship of the trinity "grain-bread-man".

The purpose of the event is to educate the population about the value of bread, the technology of its transformation into bread, the importance of bread in human life, the chemistry and biochemistry of bread, the hard work of grain growers and the salvation of bread [8].

Particular attention will be paid to the equipment of the hall. "Respect the bread!" (stent), "Grain and its chemical composition", "Nutritional value of grain, flour and bread", "Daily norm of bread for a person", "Bread proteins and amino acids" (tables), "Grain growing in Uzbekistan", "Cereals" (schemes), “Bread is a priceless treasure”, “Bread is a symbol of the greatness of labor”, “The struggle for peace and bread never stops”, “Peace on earth and bread on the table”, “Ignore bread” Hanging and displaying materials such as “Do not eat don't go, "Squatting for Grain - Struggle for Life" (packages and appeals), an exhibition of various bread samples, a photo exhibition of agricultural implements, collected grain samples will add piquancy and freshness to the conference.

Several professionals will speak at the chemical night: grain growers, agronomists, historians, chemists, biochemists, doctors, economists and bakers.

In Conclusion

we can say that when teaching students in accordance with modern requirements, students are able to independently solve chemical problems, conduct chemical experiments, and actively participate in generalization classes. Demonstrative experience, effective use of student experimentation and practical work, and the integration of classroom and extracurricular activities in developing their interest in chemistry allow them to be directed to various chemistry-related professions.

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