



THE IMPORTANCE OF USING VIRTUAL PROGRAMS IN TEACHING CHEMISTRY

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<https://doi.org/10.5281/zenodo.8191392>

ARTICLE INFO

Qabul qilindi: 20-July 2023 yil

Ma'qullandi: 25-July 2023 yil

Nashr qilindi: 28-July 2023 yil

KEY WORDS

law, process, method, computer, multimedia projector, interactive whiteboard

ABSTRACT

The article discusses the pedagogical approaches to the use of auxiliary software in chemistry lessons. In addition, the use of utility software is based on an algorithmic sequence.

INTRODUCTION

Today, in our society we live in a rapidly evolving global system of information and communication technology data entry processes. In turn, informatization of society sets itself the task of informatization of education, and to achieve this, highly qualified personnel and, above all, teachers of the education system are needed for all spheres of public life.

As chemistry is one of the experimental exact sciences, knowledge and skills are further strengthened in laboratory classes. Laboratory training often requires the use of toxic and harmful, flammable and explosive reagents, complex equipment. Before starting to work directly in the laboratory, it is necessary to review it in a virtual state with the help of a computer - it saves reagents, ensures safety, increases the efficiency of the learning process. For this reason, many chemical virtual laboratories have now been developed.

Thus, one of the global goals of education informatization is to train future teachers who are highly qualified and have the necessary information culture, ready and able to apply new information technologies (NI) in the process of teaching and learning management. participation in informing the educational institution and society in general [1,2,3,4,5].

Training. The law of conservation of mass. Course Objectives:

- To teach students the law of conservation of mass of matter logically (at the level of atomic-molecular theory) as a fundamental law of natural science - one of the visions of the law of conservation of energy;
- to explain and understand the importance of the law in the development of chemistry and nature science and its application to natural phenomena and processes [6,7].

Type of lesson: explanation - a method of illustration (multimedia presentation), problem-

based presentation of educational material. Training coverage:

- computer;
 - multimedia projector;
 - interactive board;
 - Demonstrated experience (in the video). Course:
1. Activation of existing knowledge and skills:
 - What is the substance?
 - How do substances differ from each other?
 - What signs quantify the substance?
 - What features make up the qualitative description of the substance?
 - What groups of substances can be divided according to their properties?
 - What determines the specificity of the chemical properties of the substance? [8]
 2. Creating a problem situation.

Do you think the mass of a substance changes during the interaction of substances? (As a rule, students are offered different answer options)

[9]

3. Solve the learning problem.

"Does the mass of a substance change during the interaction?"

4. The solution to the learning problem.

In order to test the hypotheses presented, an instructional experiment illustrating the law of conservation of mass is given. He argues to students that the mass of a substance does not change as a result of an interaction (in the video) [10].

5. Apply the identified solution and confirm its validity.

RESULTS AND DISCUSSION

The correctness of the answer to the problematic question is revealed on the basis of a historical approach. In this case, students will be shown the history of the discovery of the law, its role in the development of chemistry.

Another learning problem is "Why doesn't the mass of the substance change during the reaction?" The answer to the question is also found. This is explained within the framework of atomic-molecular theory, using the properties of known atoms to students [11,12].

As a result of showing the animated videos shown in the lesson, students are expected to conclude that:

explains that atoms do not disappear during chemical reactions, but that they change their grouping. Given that the reaction products are formed from the initial reaction products, the atoms do not change in quantity, hence the total mass of the substance is preserved. 6. Consolidation of knowledge and skills obtained from the studied material, drawing final conclusions.

Given the characteristics of chemical computer programs, we propose to divide them into classes as follows.

1. Animated, voice, free programs: Crocodile chemistry 605, Chemistry (grades 8-11) Virtual laboratory;
2. Animated, free, silent programs: Davriyadval, ChemsK12, ChemDraw Ultra 11.0, Gauss View;
3. Animated, limited, silent programs: Chemical calculator, CHEMIX 12,

ChembalanceWiziard32, Humua42.

When using the listed programs from 3 main classes to teach chemistry, it is expedient to distribute them as follows, taking into account the level of knowledge and abilities of students; 1st grade programs for secondary schools, 1st and 3rd grade programs for academic lyceums and vocational colleges, all 1st, 2nd and 3rd grade programs in higher education institutions are widely available. We propose the distribution of the use of chemical computer programs for the teaching of chemistry in higher education in accordance with Table 2.

In teaching chemistry for higher education institutions
distribution of chemical computer programs used

1. Inorganic chemistry

Crocodile chemistry605, Chemistry (8-11 classes) Virtual laboratory, Periodic table, CHEMIX 12.

2. Analytical chemistry

Crocodile chemistry605, Химический calculator, Davriyjadval, Хумуа42.

3. Physical chemistry

Crocodile chemistry 605, Chemistry (8-11 classes) Virtual laboratory, ChembalanceWiziard32

4. The structure of matter

Periodic table, ChemsK12, ChemDraw Ultra11.0, Gauss View

5. Organic chemistry

ChemsK12, Chemistry (8-11 class) Virtual laboratory, Gauss View I believe that the effectiveness of the educational process will be further enhanced if the above-mentioned suggestions on the classification and application of chemical computer programs are taken into account in the teaching of chemistry.

CONCLUSION

It is expedient to conclude the review of the new material by revealing that the law of mass action is the scientific basis for writing the equation of a chemical reaction (slides). Students are then given tasks to perform interactive exercises (slides). Students will be given maximum assistance in completing the task with handouts in various forms. In the end, it is based. A report is generated for each task exercise and the errors in it are indicated and the correct answer is formed (quickly and accurately assessed by computer control)..

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