



# ANALYSIS OF THE LEVEL OF LEARNING TO IMPROVE THE METHODS OF TEACHING CHEMISTRY ON THE BASIS OF INNOVATIVE APPROACHES IN PEDAGOGICAL HIGHER EDUCATION INSTITUTIONS

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In today's increasingly globalized world, the main advantage of highly developed countries is the availability of opportunities for personal development, which is determined by the state of the education system. The factors that ensure the current and future sustainable economic growth of the country are also directly related to the development of education.

Therefore, from the first days of independence, as in all areas, special attention is paid to the development of education, the development of the younger generation as both spiritually and physically mature personnel and the quality of competitiveness. As a result of this attention, a system of continuing education was formed.

The most important task of the higher education system is a mature person who has mastered the basics of general sciences and professional knowledge, can be active in any situation, is competitive and constantly engaged in creative research, as well as meets world standards of education and industry. training of specialists.

In this regard, as the First President of the Republic of Uzbekistan Islam Karimov said, "The priority for us is to raise spiritually mature, intelligent, knowledgeable, demanding, strong-willed, competitive, courageous children who have risen to the level of public policy."

We must not forget that the foundation of our future is laid in educational institutions, in other words, the future of our people depends on how our children are educated and brought up today. To do this, every parent, teacher and coach must first see the person in the image of each child. Based on this simple requirement, the main goal and task of education should be to bring up our children as independent and broad-minded, conscious people. Of course, such a responsible task requires further improvement of the education system and its content on the basis of pedagogical technologies.

Today, the modernization of educational and methodological activities and the introduction of innovative technologies in the educational process, the education of the perfect man has become one of the most important tasks for us teachers. In carrying out this task, it envisages the content of the system of continuing education introduced in our country and radical reforms in the educational process based on the achievements of modern science and social experience. To do this, first of all, there is a need to provide the educational process in all forms of education with new, modern methods

based on advanced, scientifically sound methods, to develop and implement quality management mechanisms for the educational process.

This, in turn, requires further improvement of the content of the system of continuing education, effective measures to raise the effectiveness of education to a new level of quality.

In accordance with the requirements of today's times, it is necessary to bring up young people who are well-rounded, independent-minded, able to take responsibility for the warmth of our country, enterprising, mobilize their potential in the interests of the people, their intellectual and creative potential. He created a solid foundation for the realization of his dream.

The Law of the Republic of Uzbekistan "On State Youth Policy" states: "It has created a solid legal basis for the mobilization of courageous young people, the realization of their intellectual and creative potential."

The National Program of Personnel Training states that "The main goal and driving force of economic reforms in our country is the creation of conditions and effective mechanisms for the full development and well-being of the individual, the interests of the individual. An important condition for the development of Uzbekistan is the formation of a perfect system of training based on the rich intellectual heritage of the people, the achievements of modern culture, economy, science, engineering and technology on the basis of universal values."

Decree of the President of the Republic of Uzbekistan dated February 7, 2017 No PF-4947 "On the Strategy for further development of the Republic of Uzbekistan" "Development of education and science" "Further improvement of the system of continuing education, increasing the capacity of quality educational services, continuing the policy of training highly qualified personnel in line with modern needs of the labor market", equipping their material and technical base by equipping them with modern teaching and laboratory equipment, computer technology Improving the quality and efficiency of higher education institutions on the basis of the introduction of international standards for the assessment of the quality of education and training by strengthening, creating favorable conditions for the education of students and teachers achieving this was identified as a necessary task.



The main goal of the program is to reform and improve the education system. This, in turn, requires higher education professors and teachers to update the textbooks on the relevant disciplines, taking into account modern requirements and the latest achievements of science, the introduction of innovation and educational technologies in the educational process.

It is no secret today that the use of innovative technologies in educating the younger generation guarantees a higher level of results than traditional lessons. This is a vital fact, because it is needed not only in higher education institutions, lyceums and colleges, but also in the early stages of general secondary education. This is because trainings based on innovative technologies satisfy the desire of young people to express their attitudes to important life achievements and problems, give them an opportunity to think, to justify their views.

The chapter "Improvement of statistics in the field of science and innovation" of the Resolution of the President of the Republic of Uzbekistan dated August 3, 2020 No PP-4796 "On measures to further improve and develop the national statistical system of the Republic of Uzbekistan": "On science, research and development the preparation of relevant statistics is important to monitor the country's innovative development and encourage innovation. There are a number of problematic aspects in science and innovation statistics. In particular, there is a lack of information and methodological assistance in the implementation of classifications, methodologies and tools in accordance with international practice, such as the Oslo Guidelines 2018 and the Frascati Guidelines 2015 .

There is also a need to study the experience of European countries in the collection, presentation and use of statistics in the field of science and innovation. The following tasks have been identified to address these issues:

- Professional development of officials of the State Statistics Committee and the Ministry of Innovation Development of the Republic of Uzbekistan;
- Development of statistical methodologies in the field of science and innovation and the introduction of

internationally recognized standards in the process of preparation of statistics in the field of science and innovation, such as "Oslo Guidelines 2018" and "Frascati Guidelines 2015" [7].

35-2021 of October 19, 2021 states in the "General provisions" of the "State Standard of the Republic of Uzbekistan":

- General requirements for the quality of training, the content of education;
- The necessary and sufficient level of knowledge of the training of students and the general qualification requirements for graduates of higher education institutions;
- the amount of workload;
- determines the procedures and mechanisms for assessing the activities of educational institutions and the quality of training.

State educational standards are the basis for the development of relevant documents (qualification requirements for undergraduate and graduate specialties, curricula, study programs, etc.) governing the evaluation of the educational process, the activities of educational institutions, the quality of staff, textbooks and manuals [8]

According to the approved State Education Standard: The main goals and objectives of the curriculum are:

The main purpose of the curriculum is to train mature and competitive personnel in accordance with the requirements of the state educational standards and qualification requirements for bachelor's and master's degrees. defining and arranging logical sequences;

The main task of the curriculum is to optimize the learning process in a logical sequence that ensures the effective mastering of subjects by students in semesters and academic years during the educational process in a particular bachelor's and master's degree, the period of study, types, hours, credits and final control. setting deadlines.

Table 1 defines the period, types, volume of hours, credits of teaching the subject of chemistry teaching methods for students of the 1st level of chemistry education in higher education institutions of pedagogy as follows.

**Table 1**  
**2021-2022 Academic Year for Undergraduate Education in Chemistry**

| Size<br>Total hours and credits     | Types of training |                    |                     |                       |
|-------------------------------------|-------------------|--------------------|---------------------|-----------------------|
|                                     | Lecture training  | Practical training | Laboratory training | Independent education |
| VI semester, 60 hours, 2 credits    | 10                | 10                 | 10                  | 30                    |
| VII semester, 120 hours, 4 credits  | 20                | 20                 | 20                  | 60                    |
| VIII semester, 180 hours, 6 credits | 30                | 30                 | 30                  | 90                    |

Table 2 defines the period, types, volume of hours, credits of teaching the subject of chemistry teaching methods

for students of the 2nd level of pedagogical education in the field of pedagogy.



**Table 2**  
**For the Bachelor's Degree Programs in Chemistry in the 2020-2021 Academic Year**

| Size<br>Total hours and credits      | Types of training |           |            |             |
|--------------------------------------|-------------------|-----------|------------|-------------|
|                                      | Report            | Practical | Laboratory | Independent |
| In semester, 180 hours,<br>6 credits | 34                | 18        | 38         | 90          |
| VI semester, 150 hours,<br>5 credits | 30                | 12        | 28         | 80          |
| VII semester, 90 hours,<br>3 credits | 16                | 10        | 24         | 40          |

Table 3 Pedagogy Higher Education Institutions Level 3 Methods of Teaching Chemistry The duration, types, volume of hours of teaching the subject of Chemistry

Teaching Methods for undergraduate students are defined as follows.

**Table 3**  
**2018-2019 academic year Chemistry teaching methodology for undergraduate education**

| Size<br>Total hourly volume | Types of training |           |            |             |
|-----------------------------|-------------------|-----------|------------|-------------|
|                             | Report            | Practical | Laboratory | Independent |
| In semester, 60 hours,      | 34                | 18        | 38         | 90          |
| VI semester, 120 hours,     | 30                | 12        | 28         | 80          |
| VII semester, 180 hours,    | 16                | 10        | 24         | 40          |

The main goals and objectives of the curriculum:

The main purpose of the curriculum is to determine the set of knowledge, skills and competencies required for the quality training of competitive professionals by a particular subject included in the curriculum in accordance with the requirements of the state educational standards and qualification requirements for bachelor's and master's knowledge, skills and competencies. is the arrangement of parts;

The main objectives of the curriculum are:

Formation of training topics taking into account the latest achievements of science, engineering, technology, advanced foreign experience, distribution, optimization and optimization of training materials by topics and types of training in accordance with the form of education and time allocated to science, their logical ensuring consistency and integration with other disciplines;

ensuring the continuity and continuity of the system of continuing education between types of education, as well as the content and topics of science are not duplicated by the content and topics of subjects of other types of education and related areas;

to determine the forms of control over the knowledge of students using the necessary teaching and methodological conditions, textbooks, didactic materials and assessment tools and methods for the development of science, the formation of competencies, professional knowledge and skills in science.

In view of the above, the State Education Standard, which defines the content of education in the training of teachers in higher education, defines the following:

1. General requirements for professional pedagogical training and conditions conducive to its implementation.
2. Student's learning responsibilities and their scope.

3. Academic freedom of the educational institution in determining the content of professional pedagogical training.

4. General requirements for the list of areas of higher professional pedagogical training (specialties).

5. The order of development and approval of the minimum requirements for the level and content of professional training of graduates.

6. Rules of the state control over observance of requirements of the state educational standard.

The First President of the Republic of Uzbekistan IA Karimov paid special attention to the issues of wide introduction of modern information and communication technologies. it is not difficult to see and understand "[8, - p. 280].

Prerequisites for the use of modern educational technologies in teaching are: first, the abundance, breadth and rapid updating of information; second, the speed of technical development, the rapid development of modern tools and equipment; third, various technical means of teaching are evolving; fourth, external influences, there are more interesting telephone, internet, social sites, etc. for students. Such influences require that today's lessons be conducted at the level of modern requirements.

The educational technologies used today are person-centered. In modern conditions, the educational process is required to focus on the development, socialization of the individual and the development of independent, critical, creative thinking skills. Education that is able to demonstrate these capabilities in itself is called person-centered education.

Nowadays, the interest of the younger generation in computer technology has led to the creation of animation and multimedia in the science of complex chemistry. This leads to easy and quick acquisition of skills and competencies in the subject that students need to master. This facilitates the



teacher's work, while allowing the student to master the topic by performing the necessary experiments using a computer.

N.G.Rahmatullaev, H.T. Omonov, Sh.M.Mirkomilov, M. Nishonov, Sh.A. In the literature of Mamajonov, A.Khamidova "Methods of teaching chemistry" general pedagogical and didactic requirements for all stages of education to improve the effectiveness of independent work of students on the basis of program knowledge, imagination and skills, interest in scientific thinking, science, deepening professional knowledge, theoretical and practical training. There is information on improving the structure and content of the "Methods of teaching chemistry" phase. These publications also provide information on the use of innovative and information technologies to help students better understand the science of complex chemistry.

journal of pedagogical education (pedagogy) involve students in the learning process, have the ability to understand and think what they know and think, the role of the teacher in the lessons partially leads students to achieve learning objectives, the use of information technology to control student knowledge data on good yields are given.

Improving the methods of teaching chemistry in the countries of the Commonwealth of Independent States and the implementation of experiments in laboratory classes of teaching materials and its pedagogical effectiveness Yu . Gavronskaya, P. S Belov O.G. Bodina, E.G. Zlotnikov, V.S. Polosin, V.G.Prokopenko, A.Khayitov, Sh.Sh.Daminova, N.N. To'raev, S.K. It can be found in the research work of scientists such as Aliyev . They have made a worthy contribution to the improvement of the methods of organizing and conducting direct chemical experiments, to the improvement of modern methods of problem-solving and exercise methods.

Problem of classifying shooting methods is difficult to solve. The diversity of classification systems is due to the different approaches to choosing to justify them. As a basis for the classification of modern teaching methods, didactic scientists use the sources of knowledge of chemist methodologists (Y.A. Goland, S.I. Perovsky, P.I. Grudzev, S.G. Sh apovalenko), didactic goals (M.A. Danilov, M.M.Levina, D.M.Kiryushkin, V.C. Polosin), the activity of shooters' cognitive activity (I.Ya. Lerner, M.N. Skatkin, M.I. Mahmutov, M.I. Lakhmetkin).

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