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PREPARING FUTURE TEACHERS FOR THE FORMATION OF CHEMICAL TECHNOLOGICAL CONCEPTS IN STUDENTS SCIENTIFIC METHODOLOGICAL FOUNDATIONS

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ABSTRACT

Modernization of higher educational institutions and the educational process within them, improvement of the system for training pedagogical specialists' quality and oversight, equipping future educators with cutting-edge professional knowledge, skills, and abilities, and the development of ac'meological motivation in relation to professional activity within them are all seen as crucial steps in the process of developing such training. Input is offered, as well as feedback on the scientific methodological underpinnings of preparing future teachers to help pupils develop chemical technology concepts.

KEYWORDS: *Teacher, Chemistry, Technology, Concept, Formation, Methodological Basis, Internet.*

INTRODUCTION

Future chemical teachers can be instructed and their intellectual capacity increased using an interactive document "set of assignments". It is also feasible to employ current package applications from Microsoft Office, including MS Word, Power Point, E-Publisher, Excel spreadsheet, and database, to construct new types of pedagogical-multimedia electronic textbooks and master templates for use in the educational and methodological process. Based on the aforementioned programs, it is advised to rely on multimedia master templates, test newly learned information using a rating system, and ensure that the information is thorough and of a high caliber.

The subjects "general chemistry," "inorganic chemistry", "chemistry", "organic chemistry", "physical and colloidal chemistry", "chemical technology", and "biochemistry," which are inextricably linked with ICT, enable use of ICT and pedagogical technologies appropriate to the needs of the time in higher educational institutions. ICT education is a complicated process that can't be finished by giving schools computers, electronic textbooks, and Internet access. The implementation of the triple goal of teaching, upbringing, and development should be the focus of ICT education, which involves enhancing the educational process through the use of ICT tools and ensuring the theory, methodology, and practice of their development and use. The teacher should be prepared for this. The main areas of ICT education have found their asks in:

1. Formation of an educational environment based on "cloud" technologies;
2. Modernization of the technical infrastructure of informatization of the educational system;
3. Development of e-learning resources of the educational system;
4. Ensuring the mutual exchange of information in the network of participants in the educational process;
5. Expansion of distance education in education;
6. Development of the scale of personnel in ICT education;
7. Full provision of the education management system with ICT.

The possibility of teaching chemistry receives scant attention in contemporary methodological literature. As a result, G.I. Egorova proposed an author's methodology for organizing the educational process, compiled for graduates, taking into account the requirements of educational organizations; I.A. Kutney thought about the issue of developing self-education skills in teaching general chemistry. N.I. Komarova advises the widespread application of Project measures to evaluate the degree of development of chemical competence, which establishes such elements as the caliber of the future specialist's personality, including chemical literacy, experience in using chemical knowledge to solve production problems, and other factors. The drive for self-development and self-education, and the usage of IT technology. But, in our opinion, the theoretical-methodological and didactic basis for the implementation of the requirements of the contextual-competence approach in the educational process is not sufficiently developed in the literature.

The experience of developed countries, in particular, Great Britain, Australia, Switzerland, Germany, Malasi'a, Canada, associated with the training of specialists, shows that the main task of technological education is to develop intelligence and logical thinking in students based on the specificity of the chosen specialty, and on the basis of the implementation of this task, professional training of educators is ensured. In this case, as the main criteria for technological training, the level of practical training of the future specialist in activities and the degree of mastery of knowledge, skills and abilities within the specialty, adaptation to the requirements of professional activity are determined.

Indeed, professional training represents the level of knowledge, skills and abilities necessary for the further improvement of the spiritual, moral and professional qualities of a specialist throughout his career, the formation of professional competence. One of the significant aspects of the formation of professional adaptation of future technological education teachers in higher educational institutions is the principle of a systematic approach to the process. Currently, the latest achievements in the field of modern methods of organizing the educational process in the system of public education are required for in-depth study of the subject of chemistry and the widespread introduction of modern educational technologies into the course process. This indicates the need to radically update state educational standards, curricula, programs and methods in chemistry. At the same time, teaching chemistry also requires the development of new forms and means of transferring knowledge, the use of information and communication technologies and a new generation of educational literature in order to increase the activity of

students in independent work in modern educational conditions, to further develop their creative abilities.

The research work carried out by foreign scientists, scientists of the CIS countries and Uzbek scientists on the teaching of Chemistry based on information and Communication Technologies was studied and analyzed. Their work embodied the solution to a huge number of problems. But in the research works of Uzbek scientists, some ways of using modern methods in the process of teaching chemistry are shown; some of them are not systematically applied to chemical education and are not fully illuminated. In particular, insufficient attention was paid to the lack of electronically illuminated lesson developments using information and communication technologics in the acquisition of theoretical knowledge by students, the lack of modern equipment of teachers in the process of chemistry education, animation in conducting laboratory experiments and practical classes, the absence of virtual laboratory methods, the lack of good knowledge of students Among these problems, there has been no special research work aimed at further improving the quality of Chemical Education and the introduction of information and communication technologies into chemical education. In the process of teaching chemistry, there are currently not enough variational programs and textbooks, teaching aids and methodological recommendations that determine the content of teaching using electronic, animation and virtual laboratory methods.

These issues will serve as the foundation for proving that teaching chemistry more effectively through the use of electronic, animated, and virtual laboratory methods is a pressing pedagogical issue. Given that the use of information and communication technologies plays a significant role in improving the pedagogical process in the field of Chemical Education, we want to discuss this topic based on our extensive experience teaching chemistry. Through it, we hope to develop a system for increasing the effectiveness of Chemical Education based on the ICTs.

Information and communication technologies are also a pedagogical process that affects how students and teachers interact with one another, introduces innovations, and fully utilizes interactive learning methods, some of which can have an impact on educational content through student teacher collaboration. These approaches are distinctive in that the teacher and the pupils must work together to carry them out. Such cooperation has unique qualities in its process. That is:

- To make it possible for students not to be indifferent during the lesson, to think independently, to create and seek;
- Ensuring the continuity of students interests in science in the educational process;
- Strengthening students' interest in science independently, with a creative approach to each issue, their desire for knowledge.

Currently, the Daily development of ICT in our country requires young personnel trained in this area to be mature in every way. We believe that it is important and necessary for a chemistry teacher to learn the following based on the demand of the time:

- Understanding the need to create an information and educational system in teaching with the aim of accelerating education and increasing its effectiveness in order to get out of chemistry to the level of developed countries.

- Having knowledge of the achievements of the ICT industry.
- For the effective organization of the teaching process, the purpose of education is to thoroughly study the content and use the methods and tools of education, to form students ' interests in chemistry.
- To know that in order for the student to fully master the subject of study, he must achieve the preparation of the necessary pedagogical conditions.

To achieve a guaranteed result in chemistry, it is necessary to have a technical, didactic and preparatory environment in the organization of the conditions of the information and educational system of teaching. Technical environment: there should be a computer room, computers connected to internet networks, electronic whiteboard interactively, educational halls equipped with multimedia concentration. Didactic environment-there should be educational and methodological manuals, teaching and controlling electronic educational items, methodological instructions that are able to manage. To create such environments, it is necessary to pay attention to the following. Technical problems-a personal computer and devices, electronic programs that help it to work. Didactic problems-educational and methodological manuals, teaching and controlling electronic educational items that will be needed for use in the educational system. Preparation problems-the ability of a teacher of chemistry and a student to fully use information communication technologies, tools.

It is required to develop working circumstances, methodological guidelines for working and utilizing the computer, to prepare young people for work in computerized workplaces, to create the chance for learning knowledge in practice through the computer in order to address technological challenges.

Some children may not understand science well, but this is more likely due to shyness or fear than poor science comprehension. Such reading characteristics are lessened thanks to the interactive electron whiteboard. Such a whiteboard can be widely utilized to ask students questions about the material covered, complete assignments, respond to questions written on the board, write reaction and equalize them, perform various interesting and lesson-specific tasks, and assess the degree to which students have mastered the new material. It is worth noting separately that in the event of a lack of a jet during the conduct of experiments or a malfunction of the instrument, it is possible to show the experiments carried out in an animation way through a virtual laboratory.

In our opinion, there are the following advantages of teaching chemistry using information and communication technologies:

1. The knowledge that is given in the study of topics in chemistry is brought into one system and studied in relation to each other;
2. In the process of teaching chemistry, the knowledge of students in mastering topics is actively expanded;
3. In this case, each studied process is studied on an exhibition basis, and a sufficient level of skills and qualifications is formed in students on the topic;

4. The experiments carried out and shown in chemistry further increase the interest of students in this discipline, help to master the educational material, strengthen their theoretical knowledge in a practical way;
5. In chemistry, an opportunity is created to increase the activity of students. This, in turn, will radically change the reading activity of students, allowing them to become a mature and free-thinking person in the future.

In the works of a number of authors, the problems of using the Internet in the process of teaching chemistry were studied. It should be noted that the Internet is an important and very useful tool for working with educational information in chemistry. Today there is a whole complex of chemical sites. Many Information Technology Centers in educational institutions, publishing houses of educational and popular literature create special educational sites and portals on the Internet. The volume of Information Resources is becoming more and more, there are some kinds of "guides" on the Internet that help a chemistry teacher. Ragoyshi has been addressed to chemists and is dedicated to searching for chemical chemical information on the Internet. But in chemistry teaching, the possibilities of using the chemical resources of the Internet and using them in the methodological preparation of a chemistry teacher have not been specially studied.

The Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan currently has a wide range of diagnostic and interactive modules of reference and information, control electronic educational and methodological complexes at the Chirchik State Pedagogical Institute, and is currently implementing the scientific and pedagogical program "innovative cluster project" in 2021-2025. We are actively involved in the creation of these pedagogical and methodological complexes for the educational science "chemistry".

Chemical Technology is the science of economic and environmentally friendly methods and processes of chemical processing of natural raw materials, industrial waste, as well as synthetic semi-products into consumer products and means of production. It is the task of Chemical Technology to check the physico-chemical conditions of methods and processes of Chemical Technology, develop schemes of technological processes, determine the structure of tools and equipment and the necessary materials for their preparation. The main elements of any chemical technology process are raw materials, energy, tools and equipment. Chemical technology methods are used in chemical, metallurgical, building materials, fuel, textile, coal, food and other industries. In addition, there is also a common chemical technology that studies the General, important foundations and patterns of production methods and processes. Chemical Technology Studies the methods and processes of preparation of raw materials and semi-finished products, its condition, properties, shape with the help of certain production tools in order to obtain finished products. Chemical Technology is divided into inorganic matter Technology (acid, alkali, soda, salt, mineral fertilizers and other industries) and organic matter technology (synthetic rubber, plastics, chemical fibers, coloring matter, alcohol, organic acids and other industries).

Distinct teaching strategies have different organizational structures that constantly evolve as a result of process improvement. This expansion is the result of society's degree of culture rising. The regulation and classification of instructional methods are therefore necessary. The fundamentals of knowledge must be taught in schools. The Uzbekistan school, which is independent, conducts educational activities. This school's educational advantage is that it gives

pupils access to genuine scientific knowledge, which serves as the basis for the dalilictic-materialistic worldview. In our school, a large role in education is played by students in terms of activity, initiative, independent thinking, striving for the set goal, feeling their own bulge, other methods and methods of Education.

Methods of teaching chemistry are carried out in different ways. Method-it means "road". It can be dogmatic, illustrative, and heuristic. The dogmatic method of teaching is the statement of the teacher's material without the use of verbal, blind means, without proof of evidence and only with the involvement of students in repeating and memorizing this material. An illustrative teaching method-the teacher applies various private techniques, discounting ready-made knowledge to the student. They are: an explanation of the teacher, work with the textbook, work with a tape recorder and judges. Such exhibitions are used in experiments, models, screen guides tablisa's. In the illustrative method, the teacher also uses it when applying the procedure for performing techniques and methodology for performing certain practical classes. This method is more widely used in students when a minimum of knowledge is collected.

When forming techniques for the formation of practical learning skills in students, performing experiments, an explanation is carried out in the form of M: placing a solution in a test tube, suffocating the solution in a spoon. The illustrative method of teaching is most often used in the initial part of the chemistry course. During this period, students will not have enough skills and abilities. During this period, the teacher interprets the experiences by showing them himself. This method is also widely used by readers to independently perform and interpret experiments. The heuristic method of teaching is formed on the basis of the work that the students themselves do, students make a discovery directly under the active participation of the teacher. The name of this method "heuristic" comes from the word "research" method. For example, halogens are used in determining the nature of the description of their properties.

The instructor controls how the students interpret the characteristics of halogens at this time. For instance, if we add starch clay string to a chlorinated water container after putting it in a potassium iodide solution, the color won't be noticeable again. As soon as we combine the three ingredients, starch turns blue. The explanation must come from the pupils themselves. A portion of this is exploratory. The search ability approach is viewed as a form of autonomous work or independent research. The reader verifies the accuracy of theoretical information in practice. This approach, for instance, is utilized to address problems in experimental settings.

In Conclusion, All the mentioned areas of chemistry instruction in schools are currently being actively developed. However, there hasn't been much research done on the issue of methodological preparation of the future chemistry teacher for such work. All of this made it necessary to create and theoretically support a system of methodological training for chemistry teachers in order for them to function in the context of the school chemistry curriculum's informatization.

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