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USE OF INTEGRATED TECHNOLOGIES IN PREPARATION OF HIGHER EDUCATIONAL INSTITUTION STUDENTS FOR INTERNATIONAL ASSESSMENT PROGRAMS ON "ORGANIC CHEMISTRY"

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Abstract:

The article explains the importance of using integrated technologies in teaching the "Organic chemistry" subject. The article describes the information and pedagogical technologies meaning, integration, integrated education and their content. Recommendations are provided for students to become professionals who can prepare them for International assessment systems.

Keywords: Information technology, pedagogical technology, communication, integration, integrated education, switching, animation.

1.INTRODUCTION

Globally, science and technology have become the global development cornerstone. Both subjects continue to improve their life quality as these new discoveries emerge on the basis of science and technology. Although chemistry plays an important role in the world of science, technology and natural sciences, it has always been difficult to master by students of higher education institutions. There has been done a lot of work by students to strengthen the material and technical base in the "Organic chemistry" subject study to further strengthen the educational and research laboratories in the priority areas of higher education by equipping them with modern tools and equipment, the need to develop technology for conducting chemical experiments on the basis of virtual laboratories and to improve the teaching methodological framework.

Today, political, social and economic changes are taking place in the life of our republic. Today, the advanced pedagogical technologies application in the teaching process the younger generation is developing rapidly. The organic chemical reactions mechanism, the practical and laboratory classes organization on the spatial structure of the subject "Organic chemistry" in higher education institutions has not been developed, conducting information methods and communication technologies using pedagogical technologies, but scientific research is underway to create new software.

Decree PDN№-4947 on February 7, 2017 "On the Action Strategy for the further development of the Republic of Uzbekistan"[1], Resolution of the Cabinet of Ministers of the Republic of Uzbekistan on April 6, 2017 VM №-187 "On approval of state educational standards of general secondary and secondary special, vocational education"[2], Resolution PR №- 2909 on April 20, 2017, and Resolution PR №-3245 on August 29, 2017 "On measures to further improve the project management system in the field of information and communication technologies", Decree of the President of the Republic of Uzbekistan on February 19, 2018 PR № -5349 "On measures to further improve the field of information technology and communications" and Resolution PR №-3775 on June 5, 2018 "On additional measures to improve the quality of education in higher education institutions and ensure their active participation in the ongoing comprehensive reforms in the country"[3], Decree of the President of the Republic of Uzbekistan "On approval of the

[1]Decree of the President of the Republic of Uzbekistan No. PF-4947 dated February 7, 2017. On the Strategy of Actions for the Development of the Republic of Uzbekistan / Collection of Legislative Acts of the Republic of Uzbekistan, 2017, No. 6, Article 70.

[2]Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated April 6, 2017 No VM-187 "On approval of state educational standards of general secondary and secondary special, vocational education.".

[3]Resolution of the President of the Republic of Uzbekistan No. PP-3775 of June 5, 2018. "On Additional Measures to Improve the Quality of Education in Higher Education Institutions and Ensure Their Active Participation in the Comprehensive Reforms in the Country": №07/18/3775/1313 06.06.2018.

Concept of development of the higher education system of the Republic of Uzbekistan until 2030"[4] and this article to some extent serves to carry out the tasks set out in other normative legal acts on the subject.

Chemical reactions in the "Organic chemistry" discipline with the help of information technology can have a significant impact on the effectiveness of the lesson, if at the same time there is an opportunity to "live" demonstrate the mechanisms of computer-generated thematic animation and its introduction in the classroom. Thus, it is possible to increase the students' mastery level in higher education by explaining the topics of the curriculum "Organic chemistry" in the traditional way, but it is impossible to fully understand the mechanism of chemical reactions. To solve this problem, it is necessary to create a methodology for covering selected topics on the basis of information and pedagogical technologies.

The study purpose is to improve the teaching methods the subject "Organic chemistry" in the information and communication and pedagogical technologies integration, the integrated technologies development and the basics of their use, content and methodological system.

The study describes the integrated technologies development in the education system and the basics of their use, content and methodological system. The study used methods of observation, scientific and methodological analysis and generalization.

A number of practical research works are being carried out in our country to develop the education system and increase its efficiency. The main content of such research is:

- *to bring the education content to a new level on the basis of foreign experience and to create a new generation of textbooks based on them;*
- *improving the teaching process of teaching subjects using computer technology;*
- *introduction of new information and communication technologies in the educational process;*
- *introduction of modern pedagogical, innovative and integrated technologies in the educational process, etc.*

2.MATERIALS AND METHODS

Methods and means of teaching are of special importance in providing quality and guaranteed education in the learning process. It is important to use integrated technologies in the organization of the educational process at the modern level.

The word "integration" corresponds to the Latin word "integratio", which in Uzbek means to restore, restart, replenish. It is a concept that describes the relationship of individual parts, elements, their combination. The word integration is also used to describe the convergence process and disciplines interdependence. The integration concept is one of the most important scientific terms, it is a methodological tool for generalization, drawing conclusions. In science and technology, using this methodological tool, models and algorithms of general harmony between the process or event contents are created [7].

The integration importance is also important in solving the ensuring consistency problem in the content of education provided in the continuing education system. The basic concepts of the subjects taught through integration are generalized. The integration concept is also used in establishing the relationship between information about a research object and its methodology.

Integrated technology refers to technologies that result from the merging, generalization, and interconnection of two or more technologies.

The use of integrated technology in the educational process means the state of activity through the integration, generalization and interconnection of pedagogical, information and communication technologies.

The students' mastery level by subjects is one of the main factors determining the quality and effectiveness of the lesson. In improving the quality of education, it is important to plan the lesson correctly and set the goal correctly and clearly. In setting a goal, it is important to identify the time it takes to achieve the result, the learner's needs and capabilities, the methods the learner is trying to achieve to achieve the goal, and the types of controls that determine the outcome. To achieve this goal, it is necessary to introduce modern pedagogical technologies in the educational process.

Pedagogical technology is a product of the integration of pedagogical and technological approaches used in the educational process. Different pedagogical scientists have different approaches to the concept of pedagogical technology and defined it differently. UNESCO describes pedagogical technology as follows: "Pedagogical technology is the most optimal process of knowledge acquisition, using all the human potential potential and technical means through the creation, application, unification of teaching and learning methods."

Pedagogical technology is a set of teaching methods, techniques and educational tools, it is a set of organizational and methodological tools of the pedagogical process. Pedagogical technology is a systematic method of creating, applying and defining the whole process of learning and assimilation of knowledge, taking into account the interaction of technical resources and people, which sets itself the task of optimizing forms of education. Pedagogical

[4] Decree of the President of the Republic of Uzbekistan "On approval of the Concept of development of the higher education system of the Republic of Uzbekistan until 2030" National database of legislation, *09.10.2019., №06/19/5847/3887*

technology is the process of transmission and assimilation of information in a convenient form and method. Pedagogical technology is a process that guarantees the teaching of the student to read independently, to acquire knowledge, to think [6, 7]. In the process of pedagogical technology, under the guidance of the teacher, the student independently acquires knowledge, learns, masters. Hence, pedagogical technology is the activity of interacting with a person according to a predetermined goal.

3.MAIN PART

Information technology is the total methods, devices, methods and processes used to collect, store, search, process and disseminate information. Information technology is the ways, methods and techniques of using a computer in the process of collecting, processing, storing, transmitting and using data. Information technology refers to the process associated with the use of a modern computer to reduce the complexity of the processes that use this information for information processing and increase their reliability and speed. Thus, information technology is a set of methods and tools for collecting, storing, transmitting, modifying, processing information [8].

Modern information technology is a technology that can enable young people studying in educational institutions to raise education to a new level of quality by organizing the learning process based on new approaches, the formation of knowledge, skills and abilities.

The word "communication" corresponds to the English word and is used in Uzbek to mean communication, message, means of communication, media, connection, communication, connection, methods and means of transmission. A communication system is a system that performs auxiliary functions related to data transmission, among other systems.

Communication technologies are technologies that perform the function of routing (characterization) and switching connections to transmit information between computers in a network.

The main functions and requirements of the information and communication technologies of the education system are as follows:

- *recording the activities of learners and their use of the information environment;*
- *take into account support for the activities of educators and learners through counseling;*
- *recommendations for students to independently master the necessary study materials;*
- *organization of control of knowledge, skills and abilities acquired by learners in the learning process, as well as orally and in writing;*
- *to enable students to use the information resources of the educational institution without the use of educational materials, additional literature and other means recommended for the database;*
- *organization of virtual laboratory classes and practical assignments, counseling and other assistance of the educational institution staff in the distance, etc.*

The main content of the educational process in the educational process, which is based on integrated technologies, consists of the following teaching materials:

- *electronic educational and methodical complexes;*
- *a set of test programs and questions for self-monitoring;*
- *description of virtual laboratory work;*
- *independent work and control work;*
- *computer programs, electronic directories, electronic applications;*
- *additional software.*

As a result of the use of integrated technologies, training will be able to take advantage of the opportunities of network technologies from a distance. This is the basis for the organization of distance learning [7].

The main task of network technologies in distance learning is to ensure communication between teacher and student in the learning process. Without constant communication between the teacher and the students, the learning process will not be effective. In the daytime form of the education system, the communication between the teacher and the student takes place in the classroom at the same time, in the same place. In distance learning, the accounting process is carried out through telecommunications through computer network technologies [9].

In the case of the integration of the three technologies discussed above, it can be considered as the best technology for teaching and learning. The main task of the main technologies is to create an information-educational environment for students, taking advantage of the opportunities of pedagogical and information technologies, and to integrate the process of communication to students through communication technologies.

The education system of our country is currently undergoing major changes, as the trend of education development is a common feature of all developing countries. At this stage, the national economy needs free-thinking, enterprising, mature professionals who are knowledgeable in their chosen profession, who can independently find solutions to problems. Training such specialists requires the ability to apply theoretical knowledge in practice and to master new scientific problems in science independently. Because today's large-scale reforms in the education, government decisions to improve the content of education require linking education with life, increasing the effectiveness of teaching, educating a harmoniously developed generation for a rapidly developing society.

The use of Internet information in the subject of "Organic chemistry" teaches students to express themselves in groups, to think and work independently, to be resourceful, responsive. Increases their interest in the subject of "Organic chemistry", encourages students to be active. Therefore, the aim is to introduce innovative technologies in the teaching process of "Organic chemistry" and to cover the issues of its improvement.

Changes in the education, the influx of large information flows, the emergence of the need for rapid acquisition of knowledge require the introduction of integration in the education. The use of modern information technologies in teaching is also becoming increasingly important.

When we studied the current situation with the introduction of information communication and the use of Internet data in the lessons of "Organic chemistry", most teachers noted that the teaching process was interesting and effective.There are insufficient science-based standards and guidelines for the introduction of information technology in the educational process in continuing education.

The use of information and communication technologies (ICT) opens up new perspectives and opportunities for effective teaching of the subject "Organic chemistry". At the same time, the development of independent reading skills is a necessary condition for the students' intellectual development, focusing on a particular literacy in working with information technology. In the lessons of "Organic chemistry" through the use of information and communication technologies, the use of Internet resources, homework can be given remotely by the teacher and the tasks performed by the student can be checked. ICT is the most convenient way to control the mastery of learning materials [10].

Achieving the Republic of Uzbekistan in the top 30 countries in the world by 2030 in the ranking of the International student assessment program PISA (The Program for international student assessment) is the implementation of innovative projects in the international education and information and communication technologies [5].

To prepare students for the PISA international assessment program for high school students, it is important to give students a clear understanding of the interrelationships between the natural, social, and humanities sciences, and to help students think, comprehend, and draw conclusions. The use of the integration of natural and scientific sciences and innovative technologies in explaining any topic of general secondary education has a significant impact on the development of students' knowledge. In order to ensure the continuity of science in the implementation of these tasks, it is necessary to explain them to students step by step.

In order to solve this problem, it is necessary to first train qualified personnel (teachers) from existing higher education institutions. It is these personnel who must become specialists who can prepare secondary school students for the International assessment systems. In this regard, students of higher education institutions should be taught both the integration of disciplines and the use of integrated technologies.

Therefore, in order to teach students to prepare students for the International assessment system, we provide the following information on the development of questions similar to the PISA International assessment system and their application in practice and assessment criteria.

The PISA International assessment system focuses on assessing students' creative thinking, mathematical literacy, and science literacy. Questions similar to the PISA International assessment system provide students with information and assignments based on that information. Assignments can be tests, practical exercises, color images, tables, graphs, open test questions. Through these assignments, students' creative, mathematical and natural-science literacy is tested and their cognitive abilities are assessed. In order to create and teach similar assignments, we ask students questions and assignments similar to the PISA International assessment system. For example:

Information on **"Organic substances necessary for the human body and their importance".**

Health is the most valuable asset for a person. For the normal functioning of our body, we need various chemical elements and about 10,000 compounds. For example: protein, fats, carbohydrates, vitamins and minerals.

Proteins are complex organic compounds containing 20 amino acids. Amino acids are complex organic substances that include elements such as carbon, hydrogen, nitrogen, oxygen, and sulfur. The protein cell performs various functions in the human body by participating in the formation of muscles. 15-20% of human mass consists of protein. At the same time, proteins are substances necessary for the formation of immunity, which ensures the body's resistance to various infections and viruses. Proteins are found in meat, fish, eggs, dairy products, buckwheat, oats, nuts and sunflower seeds.

Fats are a complex organic compound composed of fatty acids and glycerin. They contain the elements carbon, hydrogen and oxygen. Fats are the main source of energy in the body. Although fat is needed by the human body, its amount should not exceed 30% of the daily calories a person consumes. Excess fat disrupts the activity of the stomach, resulting in excess weight. Fats make up 19% of human mass and are part of the cell. It is preferable to use less fats and more protein in the daily diet.

Carbohydrates also contain the above elements carbon, hydrogen, oxygen. They make up 0.6% of the human mass. Carbohydrates are formed in plants from carbon dioxide and water under the influence of sunlight (during photosynthesis). Along with food, the human body includes complex (polysaccharide-starch) simple (glucose, fructose, etc.) carbohydrates. Carbohydrates are involved in the metabolic reaction of fats and proteins in the human body. Carbohydrates, like fats, are a source of energy. For example, glucose is the most important source of energy needed by the human brain. When the human body lacks carbohydrates, then the metabolism of proteins and fats is disrupted. The person becomes drowsy, weak, has headaches, nausea, tremors, nervousness. Sugar helps to get rid of the symptoms of such diseases. However, consuming large amounts of carbohydrates can lead to weight gain.

Q 1: the picture below shows the food.Look carefully at the picture and determine which foods contain protein, which contain carbohydrates and which contain fats. Explain your answer in the lines below.

Answer:_____
_____
_____
_____

Q2: The picture below shows the food. Look carefully at the picture and see what protein content the food contains. Explain your answer in the lines below.

Answer:_____
_____
_____
_____

Q3: The picture below shows the food. Look carefully at the picture and see what carbohydrates are in the food. Explain your answer in the lines below.

Answer:_____
_____
_____
_____

Q4: The picture below shows the food. Look carefully at the picture and the food on the left has a good expression through the finger, the food on the right has a bad expression through the finger. Find out why the food on the left is useful and why the food on the left is harmful. Explain your answer in the lines below.

Answer: _____
_____
_____
_____

4.CONCLUSION

In short, the above information helps to increase the students' knowledge and the educational process organization at the modern requirements level, integrated technologies in the generalization and educational content completion, the natural sciences integration is of particular importance and helps to achieve the desired goal.

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