

Increasing the Efficiency of Learning Activity of Students when Studying Bioorganic Chemistry in Remote Format

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ABSTRACT: The article discusses the possibility of effective distance learning for students using MOODLE at the Department of "Organic and Physcolloidal chemistry" of Bukhara state University. MOODLE is an open web application that can be used to create a specialized platform for the development of students or employees. It is shown that the use of electronic materials and teaching tools is effective for achieving educational goals in the study of the discipline "Bioorganic chemistry", which are implemented using computer networks.

KEYWORDS: education, distance learning, MOODLE platform, bioorganic chemistry

Introduction

Bioorganic chemistry is a fundamental science at the border of chemistry and biology, studying biologically active compounds that are common in the human body. For the chemistry departments of classical universities, the course "Bioorganic Chemistry" is a logical continuation of the course "Organic Chemistry", which deals in detail with the structure, identification of organic compounds, reactivity and chemical properties of the main classes of organic compounds. It should be noted that the rapid development of organic chemistry in recent years has led to a huge increase in the total amount of knowledge.

Today, in the modern system of higher education, along with the development of students' knowledge, skills and abilities, a consistent step-by-step study of natural and exact sciences, serve as the foundation for the formation and development of students' worldview, the assimilation of the scientific foundations of modern production technologies and the development of critical thinking skills.

In the Strategy of Action for the Development of the Republic of Uzbekistan, increased attention is paid to the use of pedagogical and new textbooks in the process of higher education, which directs students to search for the necessary knowledge, self-study, and draw conclusions. Instead of traditional lectures, where all teaching materials depend on the teacher's explanations, it is important to use methods and textbooks that are focused on increasing students' activity, independent thinking and independent work [1].

The work on the creation of distance courses "Bioorganic Chemistry" by the staff of the Department of Organic and Physcolloidal chemistry of BukhSU, carried out in the distance learning system LMS MOODLE, is designed to organize online training in a network environment using Internet technologies. The system provides a variety of online training procedures, which can be combined to organize effective training of students of chemical specialties [2-4]. During development, an editor built into MOODLE was used to create lectures, surveys, tasks, and tests

[6]. These types of content are formed from texts, images, videos, and audio files that are uploaded to the platform (Figure 1).

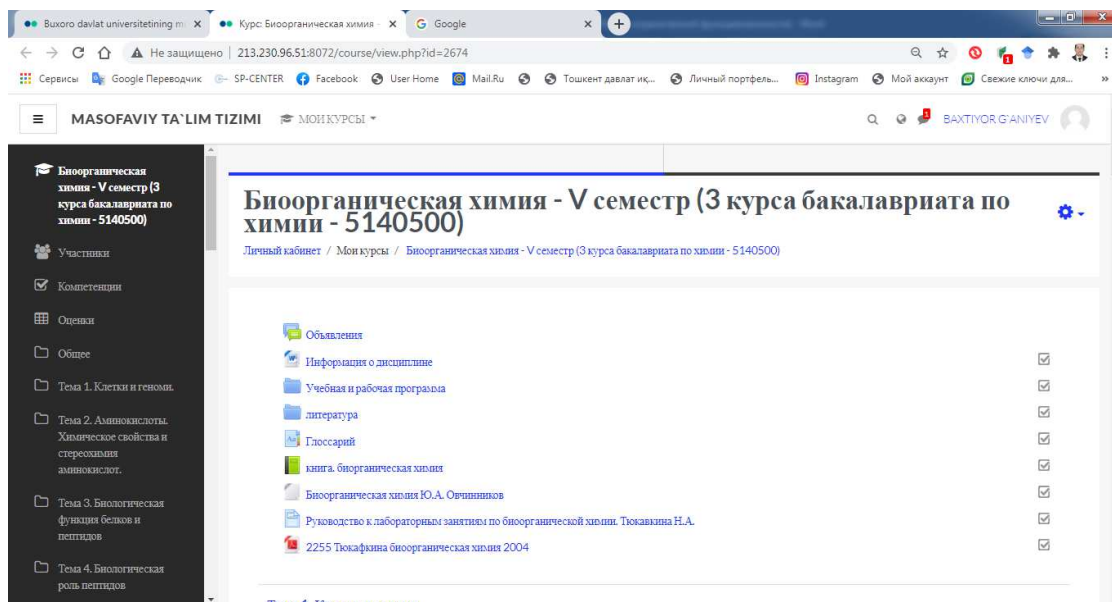


Figure 1. Status of the bio-organic chemistry course on the MOODLE platform

Research methods. The study and comparative analysis of scientific and theoretical, pedagogical and psychological, scientific and methodological sources; modeling, direct and indirect observation; conducting questionnaires, test surveys; processing, analysis and systematization of the results obtained using mathematical and statistical methods.

Result and discussion

The EEMC (in the MOODLE platform) includes the following sections and blocks, which were approved by the Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan in 2020 on March 7 by Order No. 233. According to the Order No. 233, the EEMC must consist of 16 separate materials. These are the normative documents of the discipline, the theoretical and practical sections, the knowledge control unit, the section of reference and auxiliary materials. The EEMC contains the theoretical, practical and control materials necessary for students to study the discipline in accordance with the curriculum.

The discipline's normative documents include organizational resources:

- course goals and objectives;
- curriculum;
- educational plan of the discipline;
- * calendar and thematic plans of lectures, laboratory and seminar classes;
- * schedule of consultations for performing tasks of managed independent work;
- * schedule of weekly consultations and working off of missed classes;
- * schedule of the differentiated credit (laid out at the end of the semester).

The theoretical section contains materials for the theoretical study of the discipline in the volume established by the standard curriculum (32 hours) •

* questions of the program;

* lectures - in the form of separate text files, presentations and video materials in PDF format;

This academic year, all lectures were held in the ZOOM platform by the co-author of this article of professor L.N. Gumilyov Eurasian National University, doctor of chemical sciences, professor S. B. Rakhmadieva.

The practical section contains materials for conducting laboratory and seminar classes, which include a set of explanations and instructions that allow the student to organize the process of studying the discipline by preparing, sequentially, for each classroom lesson. All seminar classes in this academic year were conducted by the associate professor of the South Kazakhstan State University named after M. Auezov, Candidate of Chemical Sciences, Asylbekova D.D.

The knowledge control block contains the materials of the intermediate and final certification, which allow determining the compliance of the results of the students' educational activities with the requirements of the educational standards of higher education •

* summary questions for the theoretical part of the control works No. 1 and No. 2;

* materials for preparing for the differentiated practical skill test;

* summary questions for the theoretical part of the differentiated credit.

The reference and auxiliary materials section contains:

• a list of recommended literature, including the number of copies in the electronic library of "BukhSU" [7];

* handouts of reference materials and tables.

The aim of the study was to study the development of students' skills of independent learning in a distance format, as well as to develop methods for its activation, theoretical justification and testing them in practice.

In the course of the study, the following tasks were set:

- identify ways to use didactic games and puzzles aimed at developing students' skills of self-study of bioorganic chemistry remotely;
- formulate recommendations for the organization and conduct of seminars;
- prepare electronic textbooks to enhance students' independent work and increase their interest in bioorganic chemistry;

Practical results of the study:

- developed methods for determining the status of the formation of independent learning skills and abilities of students in the format of distance higher education;
- practical methods of formation and development of independent activity of students are developed and recommendations are given [5];
- created and recommended scenarios of model lessons aimed at the formation and direction of independent activity;
- the possibility of using new pedagogical technologies in organizing independent work in a remote format is studied and the necessary recommendations for their practical application are given;

- the ways and means of using didactic games and puzzles are defined and the necessary recommendations are given to increase students' interest in bioorganic chemistry, the formation and development of independent activity;

The creative aspect, the purposeful implementation of which leads to the formation and development of independent thinking, allows us to bring educational activities closer to research.

The extensive use of audio-visual teaching aids and specially developed audio-visual teaching materials in self-study using computer technology was identified as important in the management of students' learning activities, and the necessary recommendations were made.

According to the test results, 80% of the students surveyed left positive feedback and willingness to use distance learning technologies for further training.

Conclusion

Thus, the experiment showed that distance learning in general contributes to the activation of learning. Currently, the prepared distance course "Bioorganic Chemistry" is being tested in the educational process of students of the specialty "5140500-Chemistry".

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