



METHODOLOGY OF ELECTRONIC EDUCATIONAL ENVIRONMENT IN HIGHER EDUCATION INSTITUTIONS (ON THE EXAMPLE OF ANALYTICAL CHEMISTRY IN TECHNICAL DIRECTION)

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ANNOTATION

The article describes the methodology of using the database of e-learning resources in the educational process to create an e-learning environment in higher education.

The article also provides conclusions based on suggestions and recommendations on the creation of a database of e-learning resources in the field of analytical chemistry for students of technical education, the use of virtual learning technologies.

KEYWORDS: information technology, animation, programming, virtuality, e-textbook, module system, e-learning environment, on-line consultation, audio file, video file, text materials, animations, virtual laboratory.

INTRODUCTION

In the world education system, the issues of improving the methodological support of disciplines using e-learning resources, the formation and development of professional competence of students, the widespread and widespread use of multimedia, and information, and communication technologies in the classroom are being studied.

Technology Development of creative thinking skills of students in higher education, improvement of professional competencies, introduction of information technology in the teaching of analytical chemistry, ensuring the harmony of theory and practice in teaching, introduction of new information technologies, innovative knowledge of students, continuous improvement of professional skills identified as a priority.

E-learning environment is a system-organizational set of software, information, interaction accounts, software and organizational-methodological software aimed at supporting higher education, meeting the needs of students for independent learning.

METHODS

The e-learning environment is formed on the basis of the principles of transparency of education:

- ✚ Openness of admission of students;
- ✚ Open planning of education, the freedom to create an individual trajectory of education within the direction of education and the corresponding curriculum;
- ✚ Free choice of time and pace of training, ie on the basis of teaching students in an e-learning environment throughout the school year, and the lack of strict deadlines for training;

- ✚ Free choice of place of study, that is, for the main part of the study period, students are not directly in the classrooms and independently determine where to study.
- ✚ Seeks to improve the quality of education based on the professional and scientific potential of leading professors and teachers;
- ✚ Students will have the opportunity to receive continuing education.

In the e-learning environment, it is proposed to consist of the following blocks:

- I. Requirements to the student.
- II. Sign up to log in.
- III. Educational science modules.
- IV. Assimilation monitoring.
- V. Final certification.
- VI. Requirements to the specialist.

E-learning environment is a new direction in the study, description and prediction of learning processes, revealing the methods and forms of education and upbringing in a high-tech information learning environment.

The following requirements are set when creating an e-learning platform for the e-learning environment:

Didactic requirements- Unlike paper copies, audio files, animation, emotional impact, and flexibility to the learner's level of knowledge, which work depending on his or her level of preparation, make it easier for the learner to learn the course material. Take into account their capabilities;

Methodical requirements- analysis by solving a large number of problems or changing the primary data, the use of graphical interpretations, creating conditions for the teacher to conduct the lesson in the form of an independent lesson, in which case the teacher participates as a consultant,



o 'to allow the teacher to control the level of knowledge acquired by students using tests of different complexity (the level of complexity is formed);

Psychological requirements -The understanding of the presentation of educational material in the e-learning environment should correspond to the level of verbal-logical, sensory-perceptual (feeling, perception) and expression of the process. Also, psychological processes related to cognition include the reception of information (mainly seeing and hearing, feeling), attention (its stability, concentration, transition from one to another, distribution and level of attention), thinking (theoretical perception, practical demonstration and practical action), imagination, memory (the phenomenon of placing data in instantaneous, short-term and long-term memory), etc;

Technical requirements - technical requirements for the creation of an e-learning environment, the rules of its preparation and use, methods of control, conditions of transportation, and use and storage.

Aesthetic requirements - It is not always necessary to take into account and comply with aesthetic requirements. They have a description of recommendations for creating an electronic manual.

Ergonomic requirements - Inextricably linked with ergonomic requirements, the electronic manual corresponds to the functional function of aesthetic formation, the order and expressiveness of the graphic and pictorial elements of the learning environment, the color scheme corresponds to the electronic manual function.

Conclusion. An e-learning environment is an interactive tool designed to partially or fully automate the learning process using computer technology. They are one of the promising forms of increasing the efficiency of the higher education process and are used as a teaching tool of modern technologies. The structure of pedagogical software includes: software product (set of programs), technical and methodological support, additional aids aimed at achieving specific didactic goals in the subject.

Teaching programs - to acquire new knowledge based on the level of knowledge and interests of students directs;

test programs - used to test or evaluate the knowledge, skills and abilities acquired; Non-standard tests created using programs such as Hot Potato, Ispring, My Test are convenient for students to assess their knowledge

Training programs - serve to repeat and strengthen previously learned training material;

Programs that organize video lessons with the participation of teachers - Movavi, Bandi Cam, Camtasia Studio.

Programs that create virtual laboratories - programs that create a virtual learning environment (Virtual reality systems). The concept of virtual reality (Virtual reality) was proposed by Jaron Lanier (Lane). Virtual being is associated with the concepts of immersion and interactivity.

Immersiveness -means that a person assumes himself in a virtual being.

Interactivity- allows the user to interact with and interact with objects in a virtual entity in real time.

There are a number of positive factors that confirm their superiority over traditional means in order to implement the technology of creating an e-learning environment. These factors were divided into didactic, psychological, economic, physiological groups.

DISCUSSION

Methodological requirements for the creation of an e-learning environment in analytical chemistry include: taking into account the specifics of a particular subject, taking into account the specifics of a particular subject, the interdependence, interdependence, diversity, implementation of modern methods of information.

Introduction of e-learning environment in analytical chemistry into educational processes:

The student's knowledge, skills and abilities in analytical chemistry;

Deep mastery of knowledge, skills and abilities in the field of science through modeling of analytical chemical processes;

Expansion of the student's field of independent activity due to the diversity of educational activities;

To individualize and differentiate the learning process based on the introduction of interactive communication capabilities;

To master the strategy of the student's mastering of educational materials through the use of artificial intelligence systems;

The presentation of chemical processes and events in the field of analytical chemistry through computer technology is important as it leads to increased interest and activity in the basics of science in students.

An e-learning portal is a node in a telecommunications network that combines various resources to deliver a database of science to the user through a simple navigation and a wide user-friendly interface:

- ✚ service to a large number of users;
- ✚ the breadth of the database scale;
- ✚ use basic network formats;
- ✚ introduction of an easy and efficient search engine;
- ✚ database resource integration;
- ✚ ensure database security;
- ✚ database stratification;
- ✚ Characterized by knowledge management-analysis.

Formation of reserves of e-learning environment in analytical chemistry:

- ✚ textual materials;
- ✚ computer training programs;
- ✚ mathematical models;
- ✚ organizational and structural models;
- ✚ conceptual models;
- ✚ educational multimedia products;
- ✚ experimental research materials;

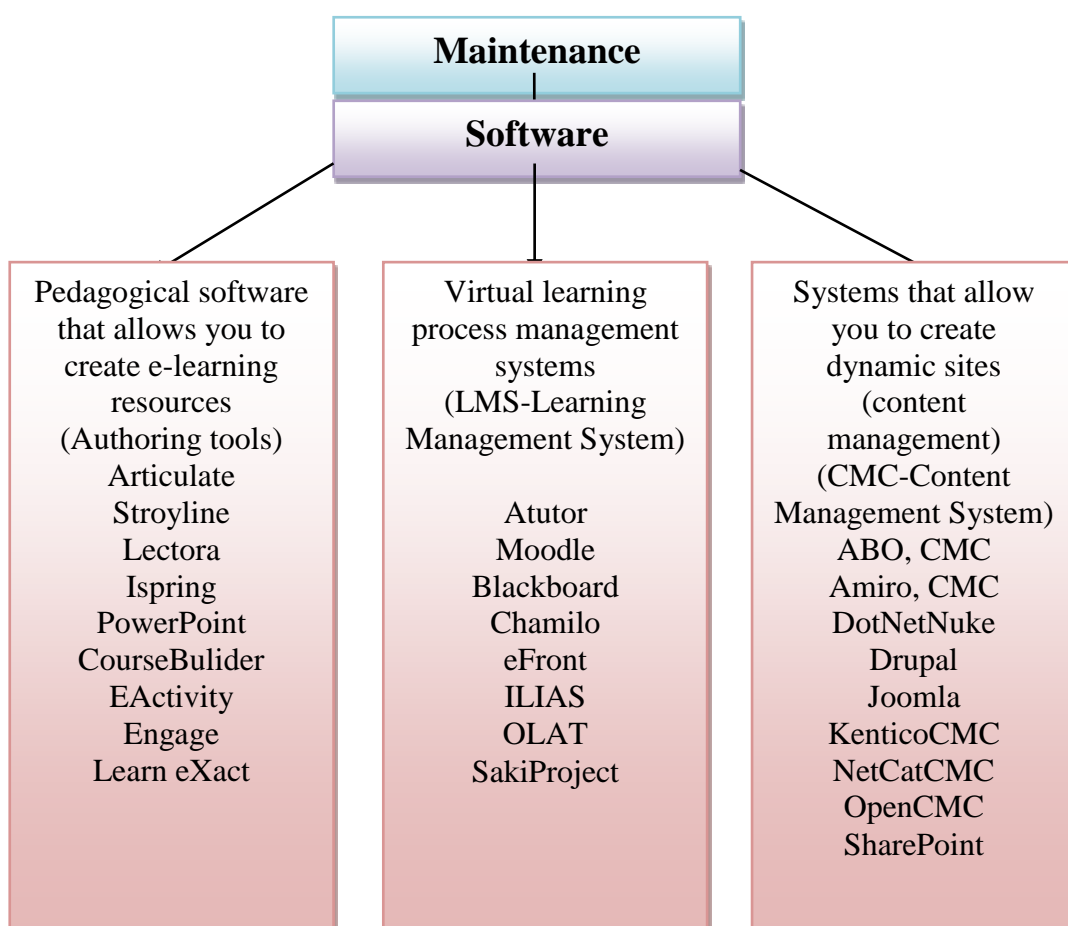


- ✦ directory information;
- ✦ results of sociological research;
- ✦ materials representing the scientific and pedagogical activity of educational institutions.

Among the many sources of e-learning are:

- ✦ Authoring tools;
- ✦ Virtual Learning Management Systems (LMS);
- ✦ Internal Content Management Systems CMS (Content Management Systems).

The structure of the software used in the organization of the e-learning environment



Problems arising in the process of teaching analytical chemistry in an e-learning environment and their solutions

Nº	Problems that arise	Solutions
1	Because subjects are not fully placed on a full-time distance learning platform, students often turn to the teacher	Through the e-learning environment created in the field of analytical chemistry, all databases will be placed on the educational platform and will be subject to regular changes.
2	In difficult topics, students do not understand the essence of the topic.	Special attention is paid to topics that are difficult to master in the e-learning environment, and video lessons, demonstration experiments are given
3	Students make mistakes when performing problems and exercises in their self-assessments	In the e-learning environment, the exchange of theoretical information, standard assignments, if necessary, online information will be established.
4	There are logical flaws in students' oral speech	In the e-learning environment, the teacher conducts oral interviews with students in classes organized through the program ZOOM
5	Low results in the initial intermediate controls	In the assessment of students in the e-learning environment, tests in each topic in the program Ispring



		form intermediate controls on crossword puzzles and assimilations in the program HotPotato
6	Students master the subject in Analytical Chemistry long before the deadline	In the e-learning environment created by analytical chemistry, topics are secretly protected by a special code, and after mastering, the next topic is opened.
7	Cases of low or no data entry in student notebooks	In the e-learning environment, students can use the e-textbook created in Analytical Chemistry at any time
8	Low overall results	In an e-learning environment created from analytical chemistry, results can change on a daily basis

In conclusion, it should be noted that today the creation of an e-learning environment in the higher education system is an important task for all participants in its effective use in the educational process. The e-learning platform in the field of analytical chemistry is bearing fruit today.

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