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DIDACTIC CONDITIONS FOR TRAINING TEACHERS IN A DIGITAL EDUCATIONAL ENVIRONMENT BASED ON A HIERARCHICAL APPROACH

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ABOUT ARTICLE

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Abstract: This article presents the didactic conditions and didactic support for training teachers in the environment of digital technologies based on a hierarchical approach, as well as proposals for improving the organization of training this course in the environment of digital technologies. In addition, the importance of general didactic methods such as problem-based, project-based, research, heuristic, and to a lesser extent - information-receiving and reproductive, which are used in higher education institutions in various areas of engineering specialties to train future engineering personnel based on a hierarchical approach to innovative activity, is theoretically substantiated.

INTRODUCTION

In preparing students for teaching based on a hierarchical approach to innovative activities using the capabilities of the digital educational environment, methods are mainly used that give the teacher the position of a performer, innovator, creator, creator of his own skills and knowledge and the opportunity to implement his own pedagogical project.

When choosing teaching methods, the authors of the study on preparing professors and teachers for teaching based on a hierarchical approach paid attention to the following: goals and objectives of teaching; principles and methods of teaching; content of the course module; age and qualification potential of students (the selection of a number of methods is aimed at the contingent of teachers with pedagogical education and their own experience in teaching); maximum use of the capabilities of the digital educational environment in the educational process; conditions provided for in the curricula for teaching and the time allocated for teaching.

In engineering specialties, the following general didactic methods are important, which are used by higher education institutions in various areas to train future engineering personnel based on a hierarchical approach to innovative activity: problem-based, project-based, research-based, heuristic, and to a lesser extent - information-based and reproductive.

Analysis of literature on the topic.

In addition to general didactic methods in the system of training personnel for innovative activities using the advantages of the digital educational environment, methods that distinguish teaching in a digital educational environment from traditional didactics are also widely used.

Teaching methods are implemented through the interaction of students with educational resources with minimal participation of the teacher and other students.

The use of these methods in teaching in the context of digital technologies is associated with the wide didactic opportunities provided by multimedia tools: interactive databases, electronic journals, computer educational programs, electronic textbooks, etc. We will discuss these and other educational tools in our research work below.

It should be noted that the use of these methods and related educational tools in a digital educational environment introduces an important component of self-education into the educational process.

RESEARCH METHODOLOGY

Methods based on interactive interaction between all participants in the educational process.

The development and implementation of these methods is associated with the holding of debates and conferences in study groups, the implementation of joint projects, etc. In this research work, the method of pair discussion, which has its own characteristics of implementation in a digital educational environment, is also widely used. Participants in such a discussion are separated from other members of the group by space, work in comfortable conditions, they have the opportunity to work both online and offline, which significantly expands the audience.

Before discussing the problem, members of the study group discuss the problem in pairs, come to a compromise on the problem or determine their point of view. Pair discussion is a preparation for a group discussion, and due to pair discussion, participants develop their own independent opinions on the problem under discussion, which are more balanced and rational. Thus, interactive interactions not only between teacher and student, but also between students themselves, become an important source of knowledge.

ANALYSIS AND RESULTS

Methods of individual teaching, learning and interaction, which are also used in teaching in a digital learning environment. Individual teaching methods are implemented through modern means such as psychological and pedagogical support provided to each teacher at all stages of education, Skype, messenger, voice mail, e-mail, e-books.

Methods based on the presentation of educational material to students by a teacher or tutor without the active participation of the student in communication: lectures recorded on audio or video cassettes, read in traditional ways or using Internet technologies. As noted, these methods are a kind of network modification of reproductive methods. At the same time, the widespread use of multimedia capabilities makes this representation of the material qualitatively different from the traditional one.

From the point of view of a systematic approach, it is very important that the teaching methods used correspond to its organizational forms.

In a digital learning environment, traditional forms of learning are used: lectures, seminars, consultations, practical exercises, tests, exams, independent work, etc. In addition, in this research work, attention is paid to the combined use of various forms of learning in each lesson, and such approaches are justified in terms of pedagogical goals.

A special technology for presenting educational material is discrete lectures, the technology of its preparation, organization and conduct was developed by the author at the distance learning base of the Karshi Institute of Engineering Economics.

This teaching technology implements one of the main ideas of targeted improvement of the teacher's qualifications and combination of theory with practice - the presentation of topical research topics by the developers at the teacher's command and the preparation of materials - discrete lectures. The specific features of teaching based on a hierarchical approach are that the teacher selects the forms of the lesson, determining them based on the logic of the content of the program and educational material.

Videoconferencing is a form of network pedagogical audiovisual interaction of all participants in the pedagogical process through network audio-video technologies. Videoconferencing helps to bring the mediation communication closer to live, direct, and thus increases the effectiveness of the interaction between the teacher and the learner [349]. Videoconferencing is one of the effective organizational forms of education in a digital educational environment. In the videoconference mode, pedagogical communication is effective from the point of view of didactic goals if it is clearly structured and methodically prepared to optimally use the capabilities of the digital educational environment.

Electronic textbooks in hypertext and multimedia versions and computer learning systems, audio educational information materials, video educational information materials, remote laboratory workshops, electronic libraries, etc. were used as didactic tools in the system of preparing students for innovative activities.

In preparing students for hierarchical training in innovative activities, we focus on the principle of maximum use of the innovative capabilities of the digital education system in the pedagogical process.

When creating electronic courses, electronic textbooks, manuals, online manuals, the need for a scientific approach to their development was also taken into account. In particular, at the stage of preparatory work for the publication of a textbook or manual, a theoretical understanding of the use of new educational tools is carried out. Therefore, the development of electronic educational resources is an important urgent problem that requires more time than the creation of a traditional textbook or manual.

In addition to a theoretical understanding of the essence and content of an electronic textbook, the task of its development is complicated by the need for a detailed study of the actions of the teacher and student in a digital educational environment. This process includes the collective work of the development team: course author (content side), methodologist familiar with the specifics of the distance learning process, programmer, designer.

The concept was followed that the replacement of traditional textbooks with innovative tools in the system of preparing students for innovative activities should be carried out on the basis of a systematic, anthropocentric and methodological approach. The conducted studies make it possible to emphasize that teaching in a digital educational environment reflects all the following components inherent in the educational process: goals, content, methods, organizational forms, textbooks. At the same time, each of the components reflects the specific features of learning in a digital educational environment. In this research work, we focused on the following imperative: namely, it is important to find such a combination of variable components and invariants of pedagogical training in the system of continuing

education, the integral connection of which ensures continuous professional development for each specific teacher in the field of modern education in the implementation of information technologies in practice.

It is appropriate to imagine the technology of working on scientific research in the context of digital education using digital tools.

In our research work, the leading features of technology in the context of digital education are:

- repetition of the educational process in the context of expanding the capabilities of digital tools;
- rational selection of digital tools, effective means for organizing communication;
- qualitative assessment of the results of research activities;
- openness and goodwill of the discussion being carried out;
- prompt (operative) feedback;
- it is emphasized that the result of the educational process consists of digital traces.

At the planning stage, the subject of communication between the teacher and the student is determined, the goal is estimated, communication methods are determined, the content of the educational process is developed, and specific directions are estimated. At the stage of organizing the educational process, training is carried out. At the control stage, mutual assessment, current and final control are organized.

Qualitative assessment of educational results includes:

- identification of skills formed in the process of training to work in a multi-tasking situation (listening to the speaker);
- record other people's thoughts, comments, ideas, questions, answers to questions, including your own comments on the speeches and comments of fellow students;
- determine the content of the process of thinking about questions to the speaker, asking them and discussing the questions asked, including your own questions;
- determine the skill of "assigning" knowledge on the methodology of scientific research;
- determine the level of formation of special and instrumental competencies;
- identify opportunities to present the results of your work (present a scientific abstract in public) and discuss your opinions, as well as independently work on mistakes and implement them in a given format.

Learning outcomes: formation (improvement) to a certain extent (conducting scientific research, developing a research apparatus, substantiating the relevance of the topic, etc.): analytical capabilities; skills (asking questions; briefly expressing one's own opinion; presenting the work done; conducting a discussion on one's own independently expressed opinions; working together on mistakes); situations of performing multiple tasks (listening to the speaker, formulating one's own personal comments on the speech and comments of comrades; thinking up questions for the speaker, asking them questions and correcting the "question-answer"); consideration of public presentation skills;

Digital tools: forum, webinar, effective use of distance learning tools such as personal messaging systems, e-mail, messenger, Skype, etc. are taken into account.

Forms of interaction: individual (personal messaging system, personal messenger, e-mail, electronic library, electronic resources, etc.), group (seminar, webinar, forum, practice, seminar, etc.), collective (open discussion).

One of the factors affecting the effectiveness of the organized educational process is the preparation of tasks for an electronic training course. In the context of digital education, the curriculum for teachers helps to create a large volume of tasks of a different quality (quantitatively) than in the traditional format, which is not limited by time limits (conditionally). In addition, each task can be a component of

the next one. In this way, it is possible to form a “linked task”. This type of task allows you to optimize the work of the teacher, since it is possible to carry out final control, which includes all the previous ones, both at the stages of training and by selecting complete tasks.

CONCLUSIONS AND SUGGESTIONS

Thus, in the process of learning, a didactic aid has been developed to implement teaching in preparing students for hierarchical teaching, which includes: a procedure and recommendations for studying the subject using a complex, reporting and control forms, a procedure for organizing interaction with the teacher; an information and educational block, that is, modules of equal size to the subject of study - each module is accompanied by tests for self-testing, practical tasks.

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