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THE CONTENT OF IMPROVING THE PROFESSIONAL TRAINING OF STUDENTS ON THE BASIS OF A DIFFERENTIATED APPROACH

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A B S T R A C T

The points presented in the article are a combination of ideas about the mechanisms for the development and implementation of the e-learning environment model, which makes it possible to improve the professional training of future engineers studying at a technical higher educational institution on the basis of a differentiated approach.

K E Y W O R D S

Ingenuity, differentiated approach, SWOT Analysis, forum, problem situation, online chat, interesting modeling, Creative Lab, intellectual puzzle, cognitive-functional.

Introduction

The model for improving the professional training of future engineers in the e-learning environment has been improved within the framework of the content of the e-learning environment.

An approach to the reality being modeled refers to the fact that the system has a much simpler construction, which is easier to implement, specifically:

Ingenuity describes to what extent the developed model is suitable for the environment in which it should be independently developed in the future.

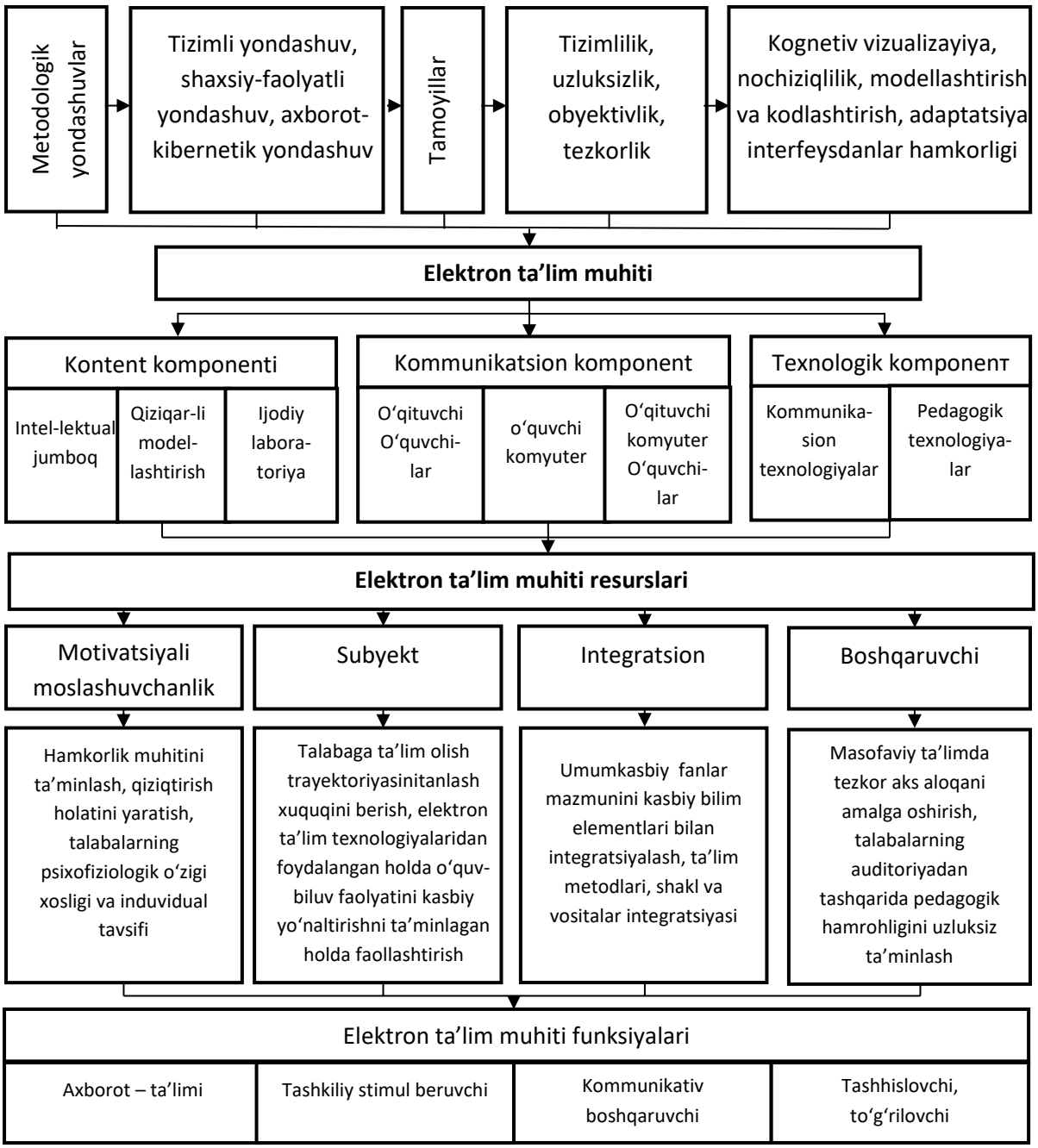
The quality of adequacy ensures that its Model matches the characteristic of the original. Thus, the realization of these properties of the developed model provides an opportunity to achieve the goal set for us.

To design an e-learning environment model aimed at improving the training of students studying at a higher educational institution in mathematics and specialty subjects, state educational standards, curricula were studied, working programs in the sciences were analyzed matrices of competencies, as well as interviews with teachers of departments specializing in mathematics and specialty subjects. It is worth noting that the process of modeling an e-learning environment should be considered in the context of its structural-functional descriptions.

The theoretical and methodological block represents the theoretical basis for the creation of an e-learning environment model aimed at improving the professional training of students studying at higher educational institutions in mathematics and specialty subjects and is based on the following rules.

System understanding of the process of carrying out professional training in mathematics and specialty disciplines helps to determine its procedural and substantive descriptions. The first assumes the interaction of preparatory components, which is understood as a system; and the second is expressed by the integration of professional-substantive States of mathematics and specialty Sciences as an already existing system, in which the existence of interdisciplinarity relations arises.

Such an approach provides research into the process of increasing training in mathematics and specialty subjects as a single whole, multi-component system accompanied by separation of elements, connections and degrees. In this case, we note that the functioning of the system is significantly influenced not only by the content, but also by the “processes” taking place in the conditions of the environment that surrounds it. The ideas of a systematic approach in this situation reveal the prospects for studying the impact of an environment with a system Nature on the implementation of professional training of students in mathematics and specialty subjects.



1 -rasm. Elektron ta’lim muhiti mazmuni.

Observing the "Environment" category shows that the system "perceives" the environment as a source and means of using resources. The environment fills the system, provides it [1;2]. In this case, the

vector of interaction between the system and the environment acquires a two-way character. The system is in the environment and experiences constant effects called factors. As a result, there is a condition that the system is required by the environment, which environment is an important direction of scientific research of any natural systems, their analysis and understanding.

The above generalization ensures us the feasibility of considering the question of the relationship between the categories of" system "and" environment". According to the logic of our study, we adhere to the following point of view. The environment, unlike the system, emphasizes the importance of the subject and its activities, interacting with the system. In this place, the system manifests itself as an environment in relation to the subject. It is not correct to consider the learning environment as a pre-given, already something. The environment begins where the harvester and the Harvester meet, where they design and build something together. Such an environment can be perceived both as a subject and as a resource of joint activity. This rule defined the consideration of the research problem in terms of the environment approach.

The differentiated approach appeared in pedagogy as a conceptual direction and as a technology for the Mediated management of the process of maturation and formation of a harmonious personality. The authors emphasize its main system - forming function at the current stage of development of education-to create favorable conditions for training and education of a competitive, independent, active person.

The pedagogical essence of the differentiated approach is reflected in the following: elimination of the mandatory discretization of the educational process, ensuring its continuity; decision-making of the ability and possibility of obtaining an independent direction in the accelerating information flow, ensuring flexibility; adding a student as a subject to the educational process, ensuring a whole, harmonized influence on a person [4].

The analysis of the Basic Rules of the differentiated approach allows us to conclude: in the e-learning environment, the process of improving the teaching of mathematics and specialty sciences can be expressed as an integral complex of peat manifestations of a complex pedagogical system, activities and elements that have experienced the influence of the environment.

We look at the differentiated approach as the main methodological rule for the implementation of the professional training of future engineers in mathematics and specialty Sciences in an e-learning environment. The environment can manifest itself both as a potential means of controlling the formation of an individual and as a means of determining the competence of a prospective specialist. In this situation, the main task of the teacher is to turn the environment into an educational one, in which the main emphasis is on strengthening the internal activity of the student, self-Research, self-development and self-improvement.

Summarizing the above points, it should be noted that the ideas of an environmental approach allow us to determine the depth and degree of influence of an environment that can be understood as a set of interconnected components with a certain educational potential on the process of training future engineers studying at a higher educational institution.

Thus, an active approach allows you to consider the main components of the activities of a teacher and a student from a single methodological position, at the same time revealing the essence of their interaction: it defines the educational process as a continuous exchange of places of various types of activities; e-learning in an environment allows you to study the preparatory process in

The ideas of this approach served as the basis for the creation of theories aimed at improving educational effectiveness in the mathematical and natural-scientific Sciences. For our research, such as the theory of formation of concepts, the theory of productive teaching, the concept of visual thinking, the theory of cognitive styles are of great interest. In modern conditions, it is taking a period to revise these concepts. In particular, this is what the process of widespread dissemination and introduction of e-learning into educational practice assumes.

The last case determined the issue of the cost of reviewing the basics of the information-cybernetic approach and moving its ideas to the problem of increasing the professional training of engineering personnel in mathematics and specialty Sciences in the conditions of an e-educational environment. This basis is a synthesis of information and cybernetic approaches. Let's take a closer look at the characteristics of each of them in the context of the problem under study.

In a broad sense, the essence of the information approach is determined by the abstract-generalized description of the functioning, construction and interaction of complex systems and the study of the information aspect. Scientists highlight the close relationship of the approach under consideration with the ideas of a systematic and active approach. This position is explained by the following factors. First, the information approach is based on a general theory of systems and focuses on the study of information exchange between systems. Secondly, information is inseparable from it as a measure of the organization of the system (the system cannot be without information). Thirdly, any activity provides for information supply and is based on the reform of existing information.

In a much narrower sense, the essence of the information approach is expressed and revealed through the construction of a "very abstract model of Information reality, a system of generalized information-theoretical knowledge at the level of Principles" [3].

In pedagogy, this approach has become widespread due to the prosperity of programmed teaching and the transition to the use of automated curricula. The methodological framework under study allows you to demonstrate and model the process of interaction between a teacher and a student in detail using a computer, as well as using distance learning technologies and e-learning technologies; promotes the separation of management as one of the leading types of activity of subjects of the educational process. In this case, usually the teacher or curriculum is the management system, and the student is the management system.

The analysis of psychological and pedagogical literature made it possible to identify two main ideas of the cybernetic approach in the aspect of increasing the training of future engineers in mathematics and specialty Sciences in the conditions of an e-learning environment.

The idea of functional diversity determines the functions of tagtisymes, in particular their control orientation. It should be noted that the functional set of the control system should be wider than the set of functions of the control system. This is explained by the fact that management is effective when a teacher or teaching program is able to influence all possible actions of a student. At the same time, the functions of the management system include: providing information, correcting errors, assessing the results of activities, stimulating the activities of the managed system (creating a successful situation), ensuring feedback. All this, in turn, should provide a managerial effect.

Summarizing the above points, we form the main positions of a differentiated approach to modeling the environment of e-learning, aimed at increasing the training of future engineers in mathematics and specialty Sciences. The main concepts are: Analysis of the pedagogical system from the point of view of the theory of management and the interaction of information flows; improvement and optimization

of education through the use of technical means, educational systems, etc. in order to increase the effectiveness of the educational process; control of the educational process through the implementation of reflection communication between subjects. In the creation of a model of the e-learning environment, which provides for an increase in the training of future engineers in mathematics and specialty sciences at a higher educational institution, the approaches implemented in the study are expressed on the basis of a certain set of principles. The first group of principles is basal and is characteristic of the preparatory process and its entire development process (principles of systemicity, continuity, impartiality, rigor, agility, predictability, fitness). The second group of principles is identity, which is caused by specific aspects of e – learning environmental activities (helplessness during training, cognitive visualization, coding, modeling, reflection communication, self-assessment of progress). The content and characteristics of these principles are revealed in the first chapter.

The goal and the studied essence of the theoretical-methodical block became the basis for the formation of the material-procedural component of the model. The theoretical-methodological block determines the possibilities of using the resources of the electronic learning environment during the preparation of students in mathematics and specialized subjects at the higher educational institution.

While developing the e-learning environment and filling it with content, we analyzed the available electronic resources on mathematics and specialized subjects. it was found that it was not compatible, not interactive enough, and the principle of cognitive visualization could hardly be implemented. Therefore, when developing the content of the e-learning environment, we relied on the information in the first chapter about the professional training of future engineers in mathematics and specialized subjects [5; 6].

It should be noted that the tasks in the training of future engineers have an important place. First, their use ensures the integrity, technology and consistency of the educational process [5;6]. Secondly, during problem solving, students use their knowledge and skills, acquire the skills of analysis, modeling and diagnosis. This, in turn, contributes to the formation of a cluster of competencies identified in the study. Tasks with a practical description are of particular importance in the process of training future engineers (practical assignments). These can be considered as tasks that are set outside of mathematics and solved by mathematical methods.

Tasks at this level are important because the research process used in problem solving involves three consecutive steps: modeling, direct research, and interpretation. The specified stages are related to the types of future professional activities of the engineer. We will consider their essence in more detail.

Modeling is the construction of a mathematical model of a real situation as a means of translating a concrete task into the language of mathematics. At this stage, students learn to analyze a situation, highlight primary and secondary relationships between data, determine their completeness, and describe a problem in mathematical language. This helps to form the cognitive activity component of the cluster of competencies presented in the study.

The second stage envisages the direct research of the model built by mathematical methods, as well as by the means of natural and scientific sciences. Here, students have to determine the most optimal way to solve the task, choose decision-making methods and sequence of work; they learn to use mathematical apparatus, to divide complex tasks into classes of simpler tasks.

Interpretation requires the correlation of the obtained result with the initial data, that is, the student interprets the answer and evaluates it according to the type of future professional activity. In addition,

at this stage, students learn to conduct a qualitative analysis of data, to establish cause-and-effect relationships of the obtained results. Usually, students start solving these types of tasks with a more stable motivation and with a high level of awareness of the importance of mathematics and specialized sciences for future professional activity.

Third-level tasks - creative tasks include open-ended or partially open-ended tasks. Open-ended tasks are a little confusing, it is difficult to understand how to act, what to use to solve the problem, but the required result is clear. Data in partially open-ended tasks may have a "missing part" or an "excess part". At the same time, their solution may include activity algorithms familiar to the student.

Such tasks imply different ways of solving, help to form research and reflexive skills, diagnostic skills. In the training of future engineers, this type of tasks is very important from one point of view, it allows to realize the idea of heuristic approach, to use a non-standard way of thinking in solving tasks that reflect the uniqueness of the future professional activity in its content (higher stage of identification of training of future engineers in mathematics and specialized subjects at the educational institution). Students with high motivation and self-esteem are usually involved in solving these types of problems. They should have mastered mathematical apparatus and natural-scientific knowledge, put forward their creative ideas when solving non-standard situations, have the ability to interpret data and predict possible consequences.

The experience of using video lectures in the professional training of future engineers in mathematics and specialized sciences allowed us to distinguish its main possibilities:

- demonstration of various experiences, conducting these experiences in the conditions of a real educational experiment is difficult or considered impossible;
- presentation of modern technologies and technological processes implemented in real industrial enterprises;
- illustration of physical, mathematical, chemical models.

Summary. The possibilities of a differentiated approach in the e-learning environment listed above can be realized within the framework of webinars. Webinar (abbreviated from the English word "webinar", "web-based seminar") - an online seminar, lecture, course, presentation, organized in the mode of direct broadcasting using web technologies will be done. With this approach, one of the main tasks of the teacher is to rationally choose and use the proposed methods, forms and methods of teaching, depending on the level and orientation of the students' education, the studied materials, etc[4].

Foydalanilgan adabiyotlar

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