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MODERN TECHNOLOGIES OF DISTANCE LEARNING
IN AGRARIAN HIGHER SCHOOL

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СОВРЕМЕННЫЕ ТЕХНОЛОГИИ ДИСТАНЦИОННОГО ОБУЧЕНИЯ
В ВЫСШЕЙ АГРАРНОЙ ШКОЛЕ

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Abstract. The article tackles the problems of forming the information-educational environment of the agrarian university, solution of which is suggested on the basis of implementing new technologies of the distance learning.

Key words: distance learning, information-educational environment, information technologies, content model, model of the educational process, agent manager.

Аннотация. В статье рассмотрены проблемы формирования информационно-образовательной среды аграрного университета, решение которых предлагается на основе внедрения новейших технологий дистанционного обучения.

Ключевые слова: дистанционное обучение, информационно-образовательная среда, информационные технологии, модель содержания, модель организации учебного процесса, агент-менеджер.

Outline of the problem. The distance learning technologies are a flexible tool for realization of students training. Creation of the information-educational environment enables introducing new forms of the training activities organization. Thus the issue of content, forms, monitoring and other training activities forms with the use of the distance learning environment becomes particularly relevant.

Analysis of recent research and publications. Experience of work in the agrarian university enables defining the major contradictions of the problem of using distance learning technologies in the system of agricultural education of Ukraine: the necessity to improve the overall quality of professional training of students and imperfect methods of future specialists training; the rapid development of global information space and imperfection of modern information technologies in the provision of educational services; the necessity to introduce new information

technologies to the educational process in high school and the lack of scientific and theoretical, methodological attainments in this sphere; the necessity of the development of agricultural education in the country, including the development through introducing information and communication programmes of this type, and the lack of technological, organizational and methodological support of the educational process; the need of the personality to obtain an individual set of educational services according to the individual needs, underdeveloped segment of

e-learning in the education of Ukraine.

The distance learning and the creation of the information-educational environment have been studied by a number of scientists: A.A. Andreev, V.Y. Bykov, V.M. Kukharenko, N.V. Morse, E.S. Polat, A.V. Khutorskyi and others. It is believed that the general problem of training students of higher school is the necessity to improve the quality of their general training through the integration of traditional and distance forms of learning.

The aim of the article: summarizing the experience and developing the recommendations for implementation and application of the distance learning in agrarian higher school.

Informatization and computerization of education enable viewing the learning process and its organization in the agrarian higher educational institutions (hereinafter agrarian university) from a new perspective. Traditional forms and methods of teaching need to be reconsidered in the conditions of the informatization of education. Several key points should be taken into account [1]:

1. The specificity of the agrarian university is studying objects of various nature (animals, plants, technical means, economic processes, technological processing of agricultural products). It makes the development of a common standard of a teaching difficult.

2. Most teachers have a conservative view of the innovations in the educational process.

3. A large number of teachers of any subject profile cannot use modern computer technologies in their daily work with students because they do not know how to work with such technologies and lack the technique of applying information, telecommunication, computer and multimedia products in the educational process.

The problem in question can be defined in the following theses [2]:

1. When implementing e-learning technologies the compliance with both general educational principles and the principle of psycho-pedagogical relevance of technology application is necessary.

2. The level of teaching with the use of new technologies depends on a teacher's professional competence in applying information and communication technologies.

3. Using new technologies in education a teacher must be aware of the key educational competences formed by multimedia means.

4. Using new technologies in education the teacher must be aware of the ways of applying multimedia resources at the various stages of a lesson.

5. Carrying out of lessons using new technologies should be considered from the perspective of system approach and management theory.

6. Application of different types of classes projecting can improve scientific organization of teacher's work which results in the optimization of the learning process.

7. Application of e-learning technologies in teaching improves the results of the educational process.

Information Training Technologies (ITT) can be defined as a set of electronic means and methods of their operation that are used for the realization of training activities. The electronic means comprise electronic hardware, software and information components, methods of application of which are specified in methodical support of ITT.

Requirements for the architecture of the educational system (specification LTSA) are specified by ISO IEEE P1484.1 / D8 - 2001-04-06 [1].

According to the standard, new training computer technology which is being designed should be regarded as a multi-level information system consisting of multiple elements connected by complex relations. Studying the components of the information support of participants of the learning process in the conditions of modern forms of organizing the educational process determines the necessity of considering the training process as an information system.

While developing methods and techniques of the information system designing the system approach is used. It comprises using analysis and synthesis of a system, defining the aims of the information support of the educational process participants, their classification, ways of organizing information database of tasks and methods of access to them by objects of training.

The characteristics of this model are:

- the possibility of a formal description of the processes of learning and knowledge control;

- the possibility to assess the indicators of efficiency of the alternative learning technologies;

- the possibility of solving problems of optimizing the educational process in view of constraints (economic, ergonomic, technical) and target functions (performance indicators of the educational process).

The use of traditional forms of knowledge representation (lectures, practical classes, seminars) mechanically transferred to electronic media leads to a number of difficulties in perception and obtaining information from a computer: too slow movement through the text due to big file size; complexity of search for relevant information in large amount of information; rapid fatigue while perceiving excessive amount of information from a computer monitor. The content of the distance course is a pedagogical model of social contract, which must be specified by curriculum, state educational programmes, educational material of each discipline, etc. The educational process, methods and organization forms of realization are determined by its content. Currently there are no normative documents and recommendations on the design of curricula (list of subjects, their content, types of activities, reporting, etc.) for the distance learning.

The model is based on fundamental didactic principles: the principle of consciousness and activity; the principle of systematicity and consistency; the

principle of the strength of learning; the principle of accessibility; the principle of the connection between theory and practice. One of the prerequisites for creating e-learning course is the use of modular principle of constructing the content of educational material.

The practice of creating distance learning courses has shown that while modeling system of knowledge on the subject the following algorithm should be used: defining input and output knowledge; compiling a dictionary of terms; identifying concepts and relations between them; forming the semantic network of notions.

Methods of teaching in higher school with the use of the distance learning intelligent system significantly differs from traditional learning technologies and are mainly based on student's self-study when a large part of teacher's work is shifted to modern training systems with information technologies (IT) [3].

An important task of intelligent system based teaching in the context of the distance learning efficiency is to create an individual learning environment that provides personalized access to resources that meets the objectives and needs of the user. In fact learning systems acquire expert knowledge of a teacher and bring them to a student. Therefore it can be stated that the main feature of the distance learning is the providing students with means for independent obtaining the necessary knowledge using modern IT. The possibility of education individualization is one of the most important benefits of using IT in education. It contributes to the problem of support of individualized training in the distance education, which consists in elaborating methods, technologies and software for creating adaptive distance learning systems based on intelligent cloud-based IT. Methodology of teaching in the process of the students' knowledge acquisition within a discipline implies realization of the approach with the use of the adaptive learning management model that is based on the Moore's theory of finite automata. The learning process is considered as a discrete process characterized by some stable states of the q_i system. Formalized model of programmed education management is in the form of a Moore machine [3].

In turn, the individualization of the learning environment with suggested method of teaching in high school helps students to understand the place of educational information in the curriculum and provides additional means for independent and more extensive exploring the subject area of study [3].

Taking into account the abundance of alternative electronic modules and available technologies a person working with them in the "student - learning environment" system experiences difficulties when choosing the basic module (platform) and rational technologies for working with it. The problem is particularly acute for open modular systems with a large amount of different options. The aim is to develop an approach to creating an agent that provides comfortable conditions in the workplace and specified learning outcome.

The agent has to generate, evaluate and produce rational behavior strategies for learners (on the basis of the analysis of student's individual features, characteristics of e-learning modules, environmental parameters: time, technical, economic constraints, etc.).

It is noted [4] that the interactive system is effective only when it meets the user's expectations. Therefore, considerihg e-learning systems the concept of "functional comfort" (FC) should be applied [5]. Hence the task can be formulated as follows: "For given technical means of training, time and resource constraints the maximum probability of specified learning outcome and maximum FC should be ensured".

The intelligent agent manager that implements the concept of neurofunctional networks [5] allows ensuring functional comfort and specified learning quality level under strict resource and time constraints. It is usable in systems with formed database of structured electronic modules. It can function in the unified information space of a university.

Ukrainian researchers pay much attention to various aspects of the distance learning which is specified in [6]. We have considered the following aspects: 1) the theoretical and methodological foundations of remote testing as the technology of assessing quality of training of future specialists; 2) the organization of independent work of students using the distance learning technologies in the process of studying professional disciplines.

Testing means of Moodle distance learning system are used to identify the subject competence of students [6]. Experience of applying testing via Moodle system enables identifying some benefits of this system.

Organization of students' independent work is carried out with the use of Moodle distance learning platform. While performing an individual work in the study of a particular course students study methodical recommendations for individual work, perform tasks, send the completed tasks for teacher to check, correct them according to a teacher's remarks, undergo the testing on the subject of independent work.

Conclusions. The modern approach to designing and implementing e-learning courses directs developers towards creating not only separate fragments but complex multilevel systems that ensure the successful combination of didactic principles of the educational process and the advantages of new information technologies throughout the learning process: from theory to solving atypical problems and knowledge control.

Solving the problem will enable creating the scientific and methodological support of the e-learning in higher agrarian education, the system of professional development of a teaching staff of agrarian educational establishments.

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