

Implementation of the System of Distance Education for Professional Retraining of Engineering Personnel in the Electronic Educational Environment of the University

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Abstract. Current trends in engineering training methodology are based on the use of information technology. The perspective direction is application of remote forms of education in the electronic educational environment of higher education institution. The efficiency of additional professional education consists in use of modern software products for ensuring remote access to educational resources. At the same time, software products have to have certain criteria: functionality, reliability, stability, multimedia, usability, modularity, ensuring access, quality of support, etc. To all these criteria fully there corresponds the Moodle software product which is used for implementation of programs of professional retraining of engineering shots in "The Systems of Automation of Management in Power" and "Systems of Automation and Management in the Oil and Gas Industry" directions in the electronic educational environment of the Amur state university. Professional retraining with use of LMS Moodle allows to expand possibilities of receiving educational services, to thereby provide realization of basic provisions of the Federal law "About Education in the Russian Federation".

1. Introduction

Now traditionally stable social institute – institute of education undergoes big changes. The techniques of teaching existing today change, and it leads to emergence of various latest forms, methods, ways, technologies of training with use of information, remote educational technologies and training online in the additional vocational education (AVE). All these changes lead to emergence of the electronic educational environment (EEE) of the university. It is possible to tell that need of formation of EEE is determined by current trends of education which are reflected in requirements of Federal law № 273-FZ «About education in the Russian Federation» article 16 [1].

In [1] much attention to application of the electronic training (ET), the remote educational technologies (RET) is paid. Such innovations give to higher educational institutions broad prospects in implementation of educational services. Use of ET and RET is one of the most important technologies of professional education used within EEE of the university [2].

2. Relevance, literature review

Concept EEE is considered in many works [3-10]. The electronic educational environment of the university is called the uniform information and education space constructed by means of integration of the educational and training information, computer and telecommunication technologies of

interaction, including virtual libraries, databases, optimum structured educational and methodical complexes and the expanded device of didactics [3]. A main objective of the electronic educational environment of the university – ensuring remote access (in the authorized mode focused on different users) to educational resources of the university, ensuring realization of electronic training in AVE [2].

Effective uses of ET and RET in additional professional education results us in need of the choice of technologies of the organization of electronic training to which software products belong.

Today various software products arranged for realization of electronic education within the electronic educational environment for EEE are developed. Many authors R I Bazhenov, S Bulganina, V K Vinnik, S V Agaponov, S G Leonidov, A L Bochkov, A V Panteleev, N Yu Shamonina, M N Firstov, G Zh Niyazova and others in the works [11-13, 15-19] considered a question of use of means of the ET and RET organization, carried out their analysis.

As will productively work with ET and RET depends on the technologies used in it. High-quality interaction of the student and teacher in EEE of higher education institution, is a main issue which technologies of electronic training have to realize. The used software has to simplify training, help to perceive a training material (lectures, practical, laboratory researches) and not to cause difficulty when using the software product. Therefore, for productive introduction in educational process of ET and RET it is necessary to pick up correctly under it the software which will perform necessary functions and to meet the concrete requirements.

3. Theoretical part

There are various criteria for selection of means of the organization of electronic and distance learning. The main is allocated in [14]. Authors carried the following to them [20]: maximum multimedia, functionality, reliability, stability, existence of development tools of content, system of an examination, usability, modularity, ensuring access, scalability and expansibility, prospects of development of the platform, quality of technical support, existence of the Russian localization of a product.

Prometheus, Blackboard, e-College, Moodle, WebCT – such software products are, as a rule, used by the Russian higher educational institutions. They have to have convenient content. The teacher has an opportunity to place electronic training materials in various formats and it is easy to operate them, whether it be, hypertext, graphic files, audio, video, the presentations, 3D - schedules and so on. Existence of expanded functionality is important. Ability of the teacher to watch a course, activity students, their process of training (how many times came on a course how many attempts are executed for passing of a task, is what is the time spent for performance of this or that task), communication in forums and chats, at emergence of questions for discussion. Software products have to have availability and informational content. For an entrance to a course listeners have to be registered. Automatically are sent to the registered users various reminder on submission of reports, performance of a task and the taking place events [13, 21].

Today, the most widespread is the environment of distance learning Moodle. This software product is used more than in 200 countries of the world by various educational institutions [14, 21]. The Moodle system («Modular Object-Oriented Dynamic Learning Environment» is the modular object-oriented dynamic training cover) is the application intended for the organization of online-lessons and the training websites. Moodle is the web application located on the server and access to it, is carried out via the browser. In works of many researchers the Moodle system [6, 11-13, 22-27] for vocational training of engineering shots in EEE of higher education institution for additional professional education is considered. This environment of distance learning first of all the directions on the organization of the training content [28-29]. Creation of courses of disciplines, programs of professional development, programs of professional retraining.

4. Implementation results

In earlier published work [30] it is told about need of development and implementation of programs of professional retraining of «The system of automation and management in power» and «The systems of

automation and management in the oil and gas industry» for retraining of engineering shots. These programs are implemented in EEE of the Amur state university, they are constructed in the environment of distance learning of Moodle. When choosing this environment all above-stated criteria were considered.

Let's consider structure of programs of the vocational training used for the preparation of engineering shots realized in SML Moodle from a position of criteria of the software product chosen by us.

Reliability, the most important in SML Moodle – convenience of administration and simplicity of updating of content. Including it has the Russian version and the built-in editor of educational content. The number of listeners of trainees in the environment of distance learning constantly varies, as well as degree of their activity of work in the program, at the same time the program always works very steadily – performance of criterion stability, scalability and expansibility.

Each student has not limited access to the SML system – criterion ensuring access.

Main units: the zero block and essential – the principle of modularity.

The zero block, this introduction to a course. It is necessary for acquaintance of the listener to teachers of a course, to a course in general, with conditions and the period of training, acquaintance to a study guide, instructions – usability.

The substantial block is materials of educational modules or disciplines (according to the curriculum). The number of blocks corresponds to the number of modules or disciplines.

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The main block comprises:

- 1 Name. The main contents (structure of the module, the list of the questions considered in discipline with the indication of terms on development of the module or discipline).
- 2 Theoretical material of the module (discipline) in a format of video of lectures, electronic lectures (presentations), graphic and hypertext files; practical tasks, laboratory works, examinations, academic year projects – multimedia.
- 3 Forums, chats for communication and discussion by students and teachers of questions of the module or discipline – the principle of functionality.
- 4 The current certification in the form of performance of the praktiko-focused tasks allowing to estimate the listener in development or improvement of the competence stated in the program.
- 5 Intermediate certification (offsets and examinations) in the form of interactive elements of control of educational achievements.
- 6 A final assessment in a format test online.
- 7 All types of certifications belong to criterion – the system of an examination.

The SML Moodle program functions with assistance of the center of information and new educational technologies which is structural division Amur state university – the principle of quality of technical support is so carried out. At the same time the platform constantly is updated and develops.

5. Conclusion

Thus, the chosen system of distance learning, allowed to define the perspective directions of development of remote educational technologies in higher education institution, to mark out the main criteria which respect is necessary for the organization of high-quality electronic distance learning. These criteria are fully provided by use of the Moodle software product for implementation of programs of professional retraining in EEE of higher education institution. Professional retraining with use of SML Moodle allows to expand possibilities of receiving educational services, to thereby provide realization of basic provisions of the Federal law «About Education in the Russian Federation».

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