WORKS IN THE EDUCATIONAL PROCESS OF HIGHER EDUCATION

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Annotation. Given the current situation with the mental and physical condition of laboratory equipment, an alternative to using virtual learning in automation laboratories instead of traditional methods of teaching students is being considered. The advantages and opportunities of using virtual and distance learning in real conditions are shown.

Keywords: information technology, virtual laboratories, distance learning process, advantages, opportunities, dynamic model.

Modern information technologies are becoming a determining factor in improving the quality of education. Virtual educational environment is a software and hardware methodical complex that belongs to the class of intellectual, providing all types of educational process, both in single – user and group mode of operation. Analyzing the role and significance of virtual educational environment in education, we can state that this role is strategically important, and the importance of virtual educational environment in education in the development of education is rapidly increasing. Virtual educational environment in education has unique capabilities that provide a significant increase in the individualization, intensity and effectiveness of the educational process. A virtual training laboratory is a software package that provides laboratory work in a virtual educational environment in a local network of a universal computer class. This opportunity highlights both the methodological and economic feasibility of this form of training. The actual visual component of a virtual environment is synthesized on the screen of the personal computer in the form of dynamic scenes with interactive user interaction with the observed elements of the current scene. For example, when modeling laboratory work in physics, the student can choose the necessary devices, installations from the rack, move them to the desktop, activate them, perform the necessary manipulations and measurements. The results of the work are made out in electronic form with the possibility of output to paper in the form of traditional reports. The specifics of the virtual educational environment in education require special, currently expensive equipment, hardware,

and software, which in the context of limited funding for universities makes it much more difficult to successfully and, most importantly, timely create it. In the conditions of continuous growth of scientific and technical achievements, the requirements for professional training of specialists are also increasing. They should not only possess new information technologies, but also effectively apply them in their professional activities, using a creative approach to solving professional problems. An important role in ensuring the necessary level of competence of specialists belongs to the system of methodological support of the educational process. Today, computer technologies are widely developed all over the world. The need to introduce new computer technologies in the educational process is not in doubt. Modern society characterizes the process of active use of a computer resource as a public product in the context of the functioning of the world information network, which allows you to provide access to information without any significant restrictions on the volume and speed of transmitted information. The emergence and widespread use of multimedia and Internet technologies makes it possible to use computer technologies as a means of communication, education, and integration into the world community. The influence of computer technologies on personal development, professional self-determination and self-restoration is also clearly felt. Virtual laboratories are a set of computer programs that simulate the processes of performing full-scale experimental research in a particular subject area. They allow you to perform laboratory work virtually, in a computer environment-on the desktop of the corresponding program. At the same time students are not dealing with real measuring devices, components and other attributes used in real research, but with their images on the computer screen. This makes it possible to perform laboratory work much faster and with less economic costs, make it more attractive for students, and increase their motivational component relative to the traditional form of training. However, virtual laboratories are particularly important for distance learning.

Virtual laboratories are implemented using the Object Pascal programming languages in the Delphi XE environment and C# in the environment. NET Framework 4.0. Moodle course management system is used to access the developed laboratories. To provide high-quality material and its better assimilation, laboratory work is divided into stages: studying the theoretical material, viewing video clips of laboratory work with illustrations of the necessary equipment, a detailed description of the actions that the student needs to perform with the necessary calculations and filling in tables. This article discusses the creation of virtual learning laboratories for

physics for students of engineering profile with the purpose of their further use in distance learning. Virtual labs are implemented using programming languages, Object Pascal Delphi environment XE and C# environment. NET Framework 4.0. To access the developed laboratories use course management system Moodle. For high-quality provision of material and better absorption of the laboratory is divided into several phases: study of theoretical material, viewing video clips laboratory work with illustrations necessary equipment, a detailed description of the activities that students must perform the necessary calculations and fill the tables.

Keywords Virtual laboratories, distance learning, Moodle course management system, Delphi XE development environment, development environment. NET Framework 4.0 Virtual laboratories, distance learning, course management system Moodle, Delphi. The development and creation of virtual laboratories are primarily due to the development of distance education. However, there are a number of disciplines in which laboratory research involves significant expenditures of educational institutions on machines, tools, blanks, reagents, etc. In addition, as practice shows, it is not always possible for students to perform laboratory work correctly the first time, after theoretical training. Often for a successful outcome, you need to conduct the experiment several times, then the costs can significantly increase. Virtual laboratories are also used in cases when an experiment occurs on an inconvenient scale of space and time, is impossible, unique, unattainable, and so on. In these cases, such laboratories become necessary in order to make it possible to conduct the educational process at a much lower cost, or they will save money by teaching students first on special virtual simulators, for their subsequent transition to real expensive laboratory stands. Physics classes at the University are characterized by a constant lack of time and the complexity of using demonstration material and laboratory equipment. Special difficulties arise for students who study in absentia and remotely. Distance learning requires students to work hard and have a certain initial level that allows them to use modern computer technologies. In accordance with the requirements of the Ministry of education of the Russian Federation, the physics program includes a cycle of laboratory work. They are necessary for students to acquire the skills to perform a physical experiment. Students should be able to process, analyze and present results in analytical and graphical forms. Since most of the training time they can not work in physical laboratories directly, the way out of this situation is the introduction of information technologies in the educational process. One of the most effective options is

animation using virtual laboratory stands, where you can perform laboratory work using Internet technologies.

The most popular form of training is correspondence and full-time correspondence training of students in such areas as computer science and engineering, law, psychology, and Economics. Every year, the number of directions that use distance learning increases. This is facilitated by the technologies used in the preparation of electronic materials for students in the SCORM format using the BooksCreator program, intended mainly for the presentation of theoretical material and their subsequent presentation in the Moodle course management system. To perform laboratory work and practical tasks, it is necessary to simulate the subject environment, which allows the student to perform a complex task at a distance.

In conclusion, it should be noted that, in fact, modern education has two sides. When considering it from one side (official), there is a curriculum, exams, strict rules, a clearly defined list of subjects in the course of study, a designated official position and the quality of training. If we look at the other side of education, that is, the other side of education. however, this is where all the aspects of modern education and self-education are concentrated: digitalization, UoPeople, eLearning, learning through Coursera, Mobile Learning and other online training complexes, webinars, virtual laboratories, etc.unfortunately, this has not yet become part of the generally accepted paradigm of global education, and yet it is still limited, but the digitalization of education and research has begun to occur.

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