

Students' laboratory practical studies in distant education.

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A stormy development of computer technologies, global telecommunication nets, local intranet-technologies further appearance of new forms of education, study and scientific activity. Internet technology makes it possible quick and easy access to global information resources, electronic libraries, publications, power calculation resources, search engines allowing to find quickly necessary information in a huge amount of internet-cities.

These technologies also further a virtual communication between people by means of Electronic mail (E-mail), news conferences, online chats, IRC, ICQ, video- and audio- conferences (NetMeeting), ip-telephonia (Webphone).

Having more possibilities and advantages distant education along with classical forms of education receives great popularity. For example, it has more flexible conditions of education for people who have not got possibilities to study by usual way (remote place from qualified educational institutes, physical handicaps, individual particularities). Distant education allows to satisfy the individual educational students' requirements, give an excellent possibility to receive a qualified help and consultation from experts located in any point of the world without leaving a residence.

Internet technology allows to build virtual classes of distant education in the form of webcity with electronic methods, manual books, to implement electronic laboratory works, tests, conferences both off-line (by means E-mail) and online (by means technology of web-design)

Let consider the web design technology application for work out the electronic manual-books and laboratory works in detail. Quick development standards of HTML (Hyper Text Make up Language), CSS (Cascading Style Sheet), DHML (Dynamic HTML), Javascript allow to build powerful webpages with application technologies of frames, tables. Together with it a technology of sensitive maps used for formulas, obvious illustrations, photos and drafts helps to create manywindows interface in a browsers.

Development of multimedia technology allows to construct animated pictures which can be uses for process's illustration in different scientific fields. Working out video- and audio records and including it in webpages create a new opportunities for realization of distant lessons.

Technology of forms in webpages and CGI (common gateway interface) allows to transfer dates, process and execute calculations on formulas and also give out results to html-page of webcity. This helps to build on-line laboratory works and tests with check of results.

Java language technique can not be substituted with the realization of complicated client-server applications, a field of its using envelops a wide range from webpages construction with advanced possibilities (for example object moving and graphic object building sensible to mouse click) to server application emulated different OS and works with date bases.

Allowing to construct whole SD-cities, SD-worlds and objects relatively new technology VRML (Virtual Reality Make up Language) can be used for the three-dimension modeling. With the help of VRML constructors it is possible to build 3D-manuals and place them in virtual laboratories.

It is refer in the article about a new technology of laboratory works on mathematical modeling.

At present the virtual physical laboratory is creating on the base of the Internet Center of the technical physics department of Belarus State Polytechnic academy. This laboratory consists of the webcity where difference electronic manual books, laboratory and practical works are placed.

Students of any high educational institute of Belarus will have a possibility to load by internet laboratory works on computer modeling, worked out by any institute of Republic of Belarus, to execute and to receive their grades. The advantages of such approach are:

- students by correspondence can deal with electronic laboratory works without leaving their residence;
- evening courses students can visit virtual laboratory at suitable time for them;
- any student of any institute can perform works at any place convenient for them (internet centers, cafes, internet-clubs, internet-classes);
- teachers of institutes will have possibility to collaborate with each other exchanging methods and experience.