

WebLabs in Education

Andreas Pester¹, Gustavo Ribeiro Alves²

¹ Carinthia University of Applied Sciences, Villach, Austria

² Instituto Politécnico do Porto, Porto, Portugal

Remote Labs are an emergent educational resource in Engineering, which addresses the remote delivery of practical contents, i.e. remote experiments, through the web. This resource may either be used as a support for e-learning courses in Engineering or Science, in the cases where on-campus lab work is not possible, or as a complement to face-to-face lab classes, allowing the students to repeat a given experiment on a remote fashion, without time restrictions.

The papers in this special focus section of the i-joe journal highlight this very important part of e-learning from several points of view. They represent the results of activities during the first International Conference on Interactive Computer aided Blended Learning (ICBL2007) in Florianopolis, Brazil. The scope of the conference was to bring together the experience in e-learning in higher education in Latin America, Europe and Northern America. The educational institutions in these regions work under different conditions and can share their experience in e-learning in a broad sense.

So you find contributions from colleagues from Brazil, Mexico, Spain, and Austria. Most of them describe concrete remote labs, developed for educational purposes. These remote experiments and labs users could see during practical demonstration session of the conference. Participants of this session were able to access and conduct real-world experiments, through the web, on domains like digital design, industrial control, and mobile robotics, among others.

The papers, published here provide the technical background for the presented remote experiment and lab. The content covers technical questions of concrete design of such labs, questions of educational framework for WebLabs and also topics of the management of WebLab resources.

The requirements for design of WebLabs for educational environments are very different in different regions of the world. So for example for low budget universities low cost solutions are very interesting, but not only for them. Also the application of remote technologies

in small and medium enterprises requires low cost solutions. Lab grids with a management system of lab resources and time reservation system were developed in European and American universities, but in distributed lab net these solutions are useful also for other higher education institutions.

Topics in usability, accessibility, localization and web security, standardization of design tools for WebLabs will get more and more central for the remote lab design in the nearer future. The rational behind remote labs, its current and potential use in Institutions of Higher Education, the educational value, and the future perspectives depends in a very high degree from the educational framework, in which these technical solutions will be embedded. This will decide about the future of this direction of e-learning.

Another very important direction in the development of remote labs and remote technologies are industrial applications. Until now remote applications are mainly restricted to closed company services in maintenance and control. But all signs show, that in a nearer future industrial, and other technological applications of remote technologies will change the landscape in industries, house technologies and service.

We therefore invite you to read the contributions of this special focus section of iJOE and get in discussion with the authors; notify them your suggestions on how remote experimentation could be used, developed on your particular case.

AUTHORS

A. Pester is with the Systems Engineering Department of the Carinthia University of Applied Sciences, 9524 Villach, Austria (e-mail: pester@cti.ac.at).

G.R. Alves is with the Polytechnic Institute of Porto, Portugal (e-mail: gca@isep.ipp.pt).