



Remote Laboratory for Secondary School Physics Curriculum

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Abstract

This paper describes the current influence of the remote laboratory on practical learning aspects of secondary sector of education. The key challenges facing the teaching of science include insufficient hands-on laboratory usage in classrooms. The main objective of the paper is to present learning approach of usage VISIR - Open Lab Platform for teaching Ohm's Law in Physics curriculum of secondary school. The activity was organized on the basis of P. Andrés Urdaneta School with support of the remote lab WebLab-Deusto. Educators can benefit from different teaching methods (collaborative, inquiry-, and project-based learning) integrated in WebLab-Deusto.

Electrical experiments are common at schools and universities worldwide. Usually students execute experiments in the frame of traditional hands-on laboratories. However, the laboratory equipment is expensive and its maintenance is complicated. The remote laboratory reduces the costs significantly, makes lab experiments available almost at any time and everywhere, personalizing the learning pathways [1], [2]. The existing remote laboratories are more or less copies of hands-on ones. Virtual Instrument Systems in Reality (VISIR) Open Lab Platform [3] is a remote laboratory created by Blekinge Institute of technology (BTH) for designing, wiring and measurement of electric circuits. This main feature of VISIR allows build scenario of performing basic DC and low frequency AC circuits experiments related to Ohm's and Kirchhoff's laws. Moreover, the students will become familiar with instruments, components, manuals, data sheets, circuit wiring, and other laboratory work.

In the paper main principle of VISIR will be presented; the remote experiments executed by students will be shown. Finally, the result of integrating of remote experiments for study in Urdaneta School will be discussed.

References

- [1] J. Rodriguez-Andina, L. Gomes and S. Bogosyan, "Current trends in industrial electronics education", IEEE. Trans. on Industrial Electronics, Vol 57, N° 10, pp. 3242-3244, October 2010, ISSN: 0278-0046.
- [2] L. Gomes and S. Bosgoyan, "Current trends in remote laboratories", IEEE. Trans. on Industrial Electronics, Vol 56, N° 12, pp. 4744-4756, December 2009, ISSN: 0278-0046.
- [3] Rodriguez-Gil,L.(2011) "Using VISIR at the University of Deusto: experiments, subjects and students" Proceedings of the REV 2011 Conference, Brasov, Romania.