VISIR+

Educational Modules for Electric and Electronic Circuits Theory and Practice following an Enquiry-based Teaching and Learning Methodology supported by VISIR

Project number: 561735-EPP-1-2015-1-PT-EPPKA2-CBHE-JP

The Project

This project targets the broad area of Electrical and Electronics Engineering, and, within it, the subject of circuit theory and practice. It aims to define, develop and evaluate a set of educational modules comprising hands-on, virtual, and remote experiments, the later supported by a remote lab named Virtual Instruments Systems In Reality (VISIR). The nature of each experiment (hands-on, virtual, real-remote) has an impact on the students' perception of circuits' behaviour, being therefore mandatory to understand how these different learning objects can be arranged together in order to scaffold their understanding and increase their laboratory-based skills. This is the concern of the underpinning teaching and learning methodology, favouring in particular the students' autonomy for discovering how circuits work, through an enquiry-based approach. VISIR+ brings together the power of the best remote lab for experiments with electrical and electronics circuits and the long history of collaboration among the consortium partners from Argentina, Austria, Brazil, Portugal Spain, and Sweden.

IMPACT:

1. For local teachers and students: at the end of the 1st training action (WP1), two representatives of each partner countries IHE will know how to use VISIR; integrate remote experiments into a course curricula; conduct inductive teaching activities with it; and develop assessment exercises involving calculus, hands-on, simulations and remote experiments. This will affect ONE course in the 1st semester 2016, in LA. All students enrolled in that course will trial the new educational materials; play an active role in the planned learning activities; and provide measurable results for the 1st quality evaluation.

2. For local institutions: the installation of VISIR (WP1) will create a feeling of ownership and involve local technicians assigned to hands-on labs for electric and electronic circuits, plus elements of the institution's IT department. The 2nd training action (WP2), conducted by two local teachers, using the 1st target course as a local implementation case, will aim ALL TEACHERS with lecture duties in courses dealing with electric and electronics circuits. The participation of two elements from the European partner IHE, plus two representatives from two nearby associated partner institutions, and the presence of one element from CONFEDI will create a noticeable impact at the local institution level.

3. For teachers, students and institutions at regional level: the 3rd training action that will take place at the associated partners will provide the opportunity to create a regional impact for both teachers, students, and institutions. This training action will use the target courses (2nd semester 2016) in the nearby VISIR host institution as case studies, and will seek one cooperative case study, using the experiments planned for target courses running in the 1st semester 2017.

4. For organizations / national: the participation of CONFEDI and ABENGE in VISIR+ provides the conditions for creating an impact at the national level, both in Argentina and Brazil.

5. At European level: the coverage guaranteed by the VISIR SIG (with yearly meetings held during the REV conference series), the two mid term checkpoints planned for CISPEE (October 2016, Vilareal, Portugal) and EDUCON (April 2017, Athens, Greece), and the recent mention of "virtual and remote laboratories being one of the emerging technologies likely to have a LARGE IMPACT over the coming five years in education around the globe." will enable using the VISIR+ project as a flagship cooperation between EU and LA, in the area of HE.

RESULTS:

1. Successfully URL installed VISIR in each latinamerican (LA) partner, forming part of an international VISIR network
2. A Course curricula, lesson plans, LMS page content of the target courses in each LA partner.
3. A exploratory study with academic and pedagogical results to improve next round of VISIR practices in each LA partner.
4. A number of documents with courses didactic designs implementing VISIR and Scientific publications for dissemination actvities
5. Development of an Evaluation Plan, Quality Assurance Plan and Measurement Instruments by UNED. All of them are embedded in all phases of the project.