

Comparative study of distance teaching of Electronics using simulation software versus OpenEngineering Laboratory

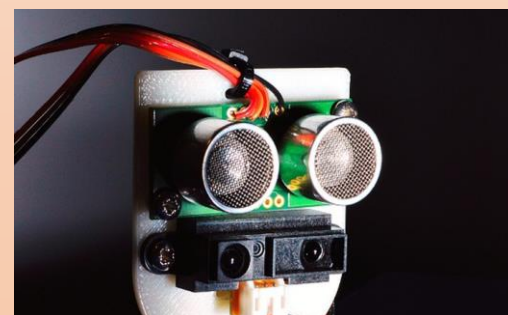
Sotiria Psoma, School of Engineering & Innovation

Introduction

- Practical laboratories are critical to enable engineering students to develop knowledge, skills, deep approach of experimentation and to build successful cross-curricular capabilities and capacities.
- Simulators are a first and economic approach but are still far from providing a deep approach for experimentation and understanding the performance of real components together with their measurement equipment limitations.
- The **OpenEngineering Lab** is a significant investment for OU, it is nearly 3 years old and its goal is to support lab-based teaching at a distance of **Electronic Engineering** modules such as T212 and T312.

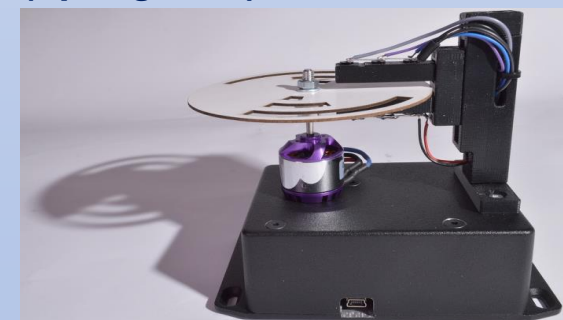
Aims of the project

- Explore the student/learners' dimension, context, pedagogic considerations and technology dimension.
- Study the perception and subject satisfaction and confidence of the students regarding the remote experiments (OEL activities) versus the electronic circuit simulations (MultiSim activities).
- Evaluate the contribution of the virtual laboratory in the building up of a knowledge and skills background in the subject of electronics.
- Capture the contribution of the above activities in the building up of respective knowledge in the subject.
- Integrate and improve new tools to support **life-long** and students' **autonomous** learning activities for remote electronics experiments in distance learning environments.



Methodology - Timeline

- Survey design for the acquisition of qualitative and quantitative data followed by interviews. **(Dec 2020 - Sept 2021)**
- Preparation of questions and details for the interviews which will allow for in-depth discussions with individuals (15 to 20 students). **(Sept 2020 - Sept 2021)**
- Selection of 5 focus groups, one of them with students with disabilities, including past and present students in **T212** and **T312** modules. **(Sept 2020 - Sept 2021)**
- Preparation of questionnaires available to the students the last 5 weeks of T212 and T312 modules. **(Apr 2021 - May 2021)**
- Data collection from the SST/SRSC OU Manchester regarding the OpenEngineering Lab activities for T212 and T312 **(Sept 2020 - Sept 2021)**
- Consultation with stakeholders (e.g. Royal Academy of Engineering) **(Spring 2021)**



Expected outcomes

- A thorough assessment of the perception of students regarding the use of remote laboratories
- An assessment related to the use and actual contribution of **OpenEngineering Lab** in the accomplishment of the learning outcomes of Electronic Engineering modules
- A proposal of improvements in existing experiments and developments of new ones
- Investigation for the development of physical experimental activities in residential schools

