Editorial

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Embedded Electronics Applied in Remote Labs and Practical Works: A technological Revolution in the Future, What Limits and Impacts?

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THE very rapid evolution of embedded electronic systems used in the communication and exchange of information, has produced benefits for humanity and also other several technical, scientific, social and problems. For example, the field of education and teaching is strongly influenced by the technological revolution of these embedded systems, due to various factors such as the availability, the low cost and the massive production of these devices. Indeed, in each house, we find at least one smart-TV and also tablets and smart-phones for each individual. Several international projects and programs, implemented by recognized and reputable organizations (UNICEF, UN, EU), encourage e-learning and impose these new technologies in the fields of training and learning [1].

A new direction of Learning is born; it is about the remote practical teaching. This new direction uses the performance of embedded Hardware and NICTs to ensure learning experiences and practical works remotely and in real time. Before the emergence of this new strategy, there were other ways that teach Practical Works (PW) otherwise, for example (simulators, virtual PWs, TV -PW, iLab, WebLab, recorded PW in videos ...). Unfortunately, these techniques are relatively limited in terms of pedagogical results and pose several other problems [2, 3]!

The design and work with remote-Labs has created new topics in scientific and technical research, and international researchers are competing to unveil the impacts of using these new methods in existing teaching environments and most importantly in practical training [4]. Several questions need to be asked and addressed by working on these new structures, based on electronic engineering and embedded systems, among which:

1- What are the impacts of the introduction of embedded devices on the psychology of the training and education system staff?

2- How to frame this new real situation legally? What are the laws, charters and conventions for protecting and using embedded systems in these areas?

3- The position of ancient and current pedagogical approaches, with the use of these technological tools in these fields [5]. How to adapt these approaches and is it necessary to change or modify them? It should be noted that

certain pedagogical approaches are based on the presence of learners and trainers, and also on the presence of the error and the real interaction and collective work [6].

4- The economic, social and environmental impacts of these new embedded devices in this area.

5- Strategies, architectures and topologies followed to design and implement remote-labs or Practical Works.

6- How to standardize the embedded hardware in these new situations to optimize interaction relations and to encompass other areas of practical training (Biology, Chemistry, Medicine ...)?

7- What are the margins of errors and technical reliability, and also the educational and psychological satisfaction of these remote-labs?

What is sure is that the introduction of embedded electronics in the training sectors and in particular the technical and practical training will change several rules existing today in the education and practical education system [7]. The major questions that researchers can ask, to study the use of embedded electronics and related engineering systems, in this direction are: How? Why ? When? Where ? and What? the limits and impacts of these technology.

Very limited the number of journals that deal this kind of problems in a targeted and multidisciplinary way. The ICSES Transactions on Computer Hardware and Electrical Engineering Journal (ITCHEE) treats scientific research subjects with innovation aspects in relation with electronics, embedded systems and computer engineering, as well as other research topics such as Robotics, Artificial Intelligence, Smart Hardware, etc. Also, the Journal (ITCHEE) accepts, motivates and encourages multidisciplinary research that can contribute to the development of other scientific and industrial sectors, by seeking solutions for reliability and good use of electronic engineering systems in the future.

With Regards

Prof. Abdessamad Malaoui, PhD

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