

# A New European distance training environment delivering VET services: In.Tra.Net system

Maria Riccio  
University of Sannio  
Piazza Guerrazzi, 1  
Benevento, IT  
[riccio@unisannio.it](mailto:riccio@unisannio.it)  
0824305817

Chiara Sancin  
DidaNetwork Srl  
Via Vitorchiano 81  
Roma, IT  
[csancin@gruppodida.it](mailto:csancin@gruppodida.it)  
0645496110

Barbara Caruso  
Dida Network Srl  
Via Vitorchiano 81  
Roma, IT  
[bcaruso@gruppodida.it](mailto:bcaruso@gruppodida.it)  
0645496110

## ABSTRACT

This contribution's main goal is to describe an innovative learning system and approach aimed to support professional training in using complex and last generation electric apparatus through distance laboratory reproducing real conditions and technical instruments. The paper describes a comprehensive solution based on a distance learning environment to distribute theoretical and practical learning activities to control and manage remote real instrumentations via Internet and web solutions. This specific solution derives from the project IN.TRA.NET (Innovation Transfer Network), a Leonardo da Vinci' transfer of innovation project funded under the 2008 call of Life Long Learning. The paper briefly presents the general framework for distance experimental learning environments, IN.TRA.NET' goals and features and the first project' evidences arising from preliminary need analysis.

activities are absolutely essential to educate and update good professional, workers and technicians; so online laboratory learning activities is actually an open challenge.

The work described in this paper has been carried out within the IN.TRA.NET. (Innovation Transfer Network) project founded by Leonardo da Vinci' transfer of innovation project under the 2008 call of Life Long Learning. It aims to design a multilanguage international distributed learning environment that uses technological solutions to develop innovative ICT-based contents, services and didactic methodology for lifelong learning.

IN.TRA.NET is characterized by the use of distance and remote learning technologies to deliver innovative information concerning the electronic and control apparatus branch to improve the qualification and competitiveness of the workers. Basic and high instructions, as well as adult training, have been recognized to be at the center of the growth, innovation, and integration processes in democratic societies.

## Categories and Subject Descriptors

### General Terms

Measurement, Experimentation, Verification.

### Keywords

Elearning, VET System, remote control, lifelong learning

## 1. INTRODUCTION

In 2000, the European Union officially announced the mission of improving the education systems in Europe with the declaration of Lisbon.

Two of the main objectives to realize such a mission are:

i) giving to all citizens the same opportunities to improve his/her degree of instruction and ii) promoting the institution of a life-long learning system to update competences and to encourage new specializations of adults and to increase their capability of finding or changing their job.

E-learning seems to be the best way to reach these objectives, as it removes the physical, geographical, and cultural barriers to education and enables learners to choose their own learning path and time.

When elearning is applied to scientific domains it is fundamental guarantee to the learners to make significant practical activities. The experimental activities or laboratory

## 2. ENHANCED EXPERIENTIAL LEARNING BY IN.TRA.NET. ENVIRONMENT

The background of the IN.TRA.NET. environment is the academic and didactic context that is characterized by some specific drawbacks that make very difficult the providing of a complete set of updated workbenches to every learner. The most relevant are: 1) the high cost of measurement equipment and, in general, of experimental laboratories in educational sites and industry; 2) the growing number of students and specialized technicians; 3) the reduced number of laboratory technical staff; and 4) the continuous evolution of involved measurement instrumentation, which makes it difficult and very expensive to keep technical staff up-to-date.

The potentiality of remote labs' activities for scientific disciplines[3], and in particular the use of the Internet as a channel to reach the students or workers at their homes, was soon recognized [4],[5]. So it was designed and implemented, through the LADIRE project [1],[2], financed by the Italian Ministry of Education and University in the National Operating Programme (PON) 2000-2006.

The project is national measurement laboratory that operatively provides to the students of electric and electronic measurement courses the access to remote measurement

laboratories and that delivers them different didactic activities related to measurement experiments to manage remote real instrumentations to learning to use them.

IN.TRA.NET. aims this innovation to an international distributed learning system allowing SME workers to make updating by experiments using remote real electronic and control apparatus as if they were in a real laboratory.

## 2.1 In.Tra.Net' goals

The IN.TRA.NET. goes more over because its main objective is to design and implement an innovative distance VET methodology and system, for SME workers for remote access and control different kinds of electronic and control equipment; not only measurement instrumentations, but also PLC, numerical control machine, and so on. The overall objective is to realize an European elearning system that allows the sectorial transfer of innovation in the enterprise world.

The main objectives is to educate good professionals and workers and to give them a solution based on remote control of real industrial instrumentations and apparatus through elearning technologies and methodologies. This functionalities are very important because for example, as in the specific case of electric and electronic measurement laboratories, both public and private ones, mainly due to their cost, they are not widespread, and this makes the life-long learning of specialized technicians particularly difficult, especially in the field of process control, quality control and test engineering.

By remoting the access to such operative equipments, workers can:

- repeat and use the operative equipment more and more times and in real conditions;

- be trained on them even before they are available in the company (or they are available only in few sites or the Corporate);

- improve or update their technical skills related to the operating processes using that equipments;

- contribute to the same sectorial innovation processes;

The main objective is to offer to the users the tool to achieve accurate and practical experience by working in real conditions and on real instruments.

The proposed didactical methodology will be based on distance learning technologies and it will address the teaching of laboratory activities and in particular the use of electronic equipment. The distance learning environment will allow the remote managing and control of real electric and electronic equipment and other real electronic instrumentation like control devices.

In order to effectively implement the innovative distance learning environment, it has to be implement a distributed software infrastructure based on centralized LMS that will be able to allow the control of the different type of real remote instrumentations. The envisaged software architectural solution will allow to remotely control every kind of electronic instrumentations, not only measurement instrumentations, such as sampling , medical and control instrumentations.

## 2.2. In.Tra.Net. Needs Analysis' Preliminary results

The needs analysis phase of the IN.TRA.NET project that has been conducted by Dida Network s.r.l. (coordinator) with the collaboration of the University of Sannio (partner) and the Sannio Industry Union (partner) and was mainly focused to the direct involvement of local end users of the IN.TRA.NET services that have to be defined and implemented.

The user needs analysis has been conducted, most of all, through meetings with the partners and the use of a specific questionnaire and has led to the definition of the following application ambits of the project: the distance training and updating on real remote instrumentations of enterprise's employer: to update SME technicians in using complex and last generations electric apparatus; the remote control of the production process quality: to control the different production phases and to show to the customer the respect of quality standards; the remote control of the apparatus performance: to plan specific interventions to solve immediately the possible critical situations before to damage irreparably the final production; the remote demo of new product.

## 3 Conclusions

This paper highlights the importance of distance training on real instrumentations arising about Vocational and Educational Training. The future related works will be referred to the software architecture solutions and methodological solutions need to satisfy user requirements.

## REFERENCES

- [1] Rapuano, F.Zoino, "A learning management system including laboratory experiments on measurement instrumentation", Proceedings of IMTC-2005, Ottawa, Canada, 2005, pp.1227-1232. To be published on IEEE Transactions on Instrumentation and Measurements.
- [2] N. Ranaldo, S. Rapuano, M. Riccio, E. Zimeo, A platform for distance learning including laboratory experiments, *AICA 2004 Symposium*, 2004, 503-516.
- [3] m. Cobby, d. Nicol, t. S. Durrani, and w. A. Sandham,(1995) "teaching electronic engineering via the world wide web," in proc. IEE colloq. Comput. Based learn. Electron. Educ., london, u.k., pp. 7/1-7/11.
- [4] g. C. Orsak and d. M. Etter,( 1996), "connecting the engineer to the 21st century Through virtual teaching," iee trans. Educ., vol. 39, no. 2, pp. 165-172.
- [5] s. M. Blanchard and s. A. Haie,( 1995), "using the world wide web to teach biological Engineering," in proc. Front. Education 1995— 25th annu. Conf. Eng. Educ. 21st century, Atlanta, ga, , vol. 2, pp. 4c5.9-4c5.14.