ManuLearn

ManuLearn II: Learning through manufacturing challenges

ManuLearn is a programme that aims to strengthen the innovation potential of the participating EIT RIS countries, while **enhancing educational framework, developing distance learning** and **boosting digital growth under the concept of Industry 4.0**.

It is designed so that students, researchers, and manufacturing practitioners can work together, combing **Teaching Factories**, **Learning Factories** and other learning practices, to develop skills through co-created solutions to real manufacturing challenges.

Special focus in this year's project activities is given to:

- Manufacturing education in the context of COVID-19
- Gender balance in manufacturing
- Boosting soft skills of engineers

ManuLearn Consortium is currently implementing a series of pilot activities in Lithuania, Greece, Czech Republic and Spain. The knowledge exchange network is established between the activity partners according the ManuLearn methodology and ICT tools.

The focus in these pilot activities are industrial challenges, particularly in the field of digitalization. Teams from all participating Universities and RTOs respond to the cases introduced by companies, and knowledge transfer happened both ways: from industry to academia regarding state of art practices and challenge establishment, and from academia to industry regarding state of art research and potential solutions.

Learning Factory by LMS

A Learning Factory, organized by Laboratory for manufacturing systems and Automation (LMS), introduced to students the basic concepts of joining processes and the advanced process of resistance spot welding with robotic systems and its application in various industries.

During this Learning Factory the students also learned about certain non-conventional methods (non-destructive testing and non-invasive control systems) for the product quality assessment.

Learning Factory by CTU

Methodologies of inspection of machine tool geometrical errors – the Learning Factory, organized at Czech Technical University in Prague on Academia to Academia level with support of an industrial partner – Kovosvit MAS Machine tools, a.s.

Through hands-on experience, participants were provided with basic knowledge of:

- Stationary geometrical errors measured with machine switched off
- Stationary geometrical errors measured with active feed drives and
- Geometrical errors measured within non-stationary behaviours
- And general metrological habits

Guided by the invited expert, participants gained valuable practical experience in non-stationary geometrical errors measurement in real industrial environments.

Participants were introduced to conventional and modern measuring techniques and applied research topics in the field of precision engineering during two sessions in two weeks end of October and beginning of November, and finally a complementary test was used as competency assessment method focusing on long-term memory and feedback.

Teaching Factory by CTU and LINPRA

Within the current international ManuLearn pilot activity Czech Technical University in Prague (CTU) students were solving the challenge, set-up by a Lithuanian engineering company Gerovė UAB.

This Industry to Academia Teaching Factory, organised by CTU and LINPRA, consists of 4 sessions with students and industry representatives, who are working with the development of an automated line for production of plastic bags. According to the company, there is a need to have an automated line of garbage bags production to avoid manual work. Automation and robotization would add to the increased productivity and reduce the risk of defects.

While working out the task and developing their solutions, participants are also practicing teamwork, communication skills in foreign language and problem solving together with industry representatives. In the end, students get valuable feedback from the company. 4 sessions of the TF challenge:

1. Introduction and challenge setup
2. Discussion: development of solutions
3. Presentation: suggested solutions
4. Evaluation and feedback

Webinar by IMH

IMH Campus pilot activity – an open webinar on the topic of Additive Manufacturing, organized for students to get to know additive manufacturing technologies and learn to define its processes.

Additive Manufacturing (AM) uses computer-aided design to build objects layer by layer, offering the ability to build parts with geometric complexities that cannot be produced by subtractive manufacturing processes. Among the major advantages of AM processes are the manufacturing of parts with high customization, freedom of design and time reduction in product development. These technologies also show numerous practical applications in aerospace, automotive, biomedical, energy and other fields.

The webinar introduced this technology, highlighted the advantages and also focused on implementation of this manufacturing technology in industry.

4 more Pilot Activities in progress