

An example of University – Industry collaboration in the degree of Chemical and Process Engineering

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ABSTRACT

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Industrial development is of paramount importance in the global economy. It requires professionals with high scientific and technological competencies, able to provide efficient technical solutions in respect of environmental and economic limits, and with adequate transversal skills such as teamwork and communication abilities (Marzo et al. 2008). Engineering schools must train professionals able to satisfy the needs of a rapidly evolving society that poses global challenges such as digital transformation, environmental and economic sustainability, the new globalization, the protection and safeguarding of health.

In Italy, employers recognize the high technical profile of Italian graduates but detect low training in the previously mentioned professional competencies, unfortunately lacking in most of the current academic Italian curricula. Employers are also pointing their attention towards graduates with adequate educational backgrounds, which also include their ability to use, evaluate and analyse processes using simulation tools. Their application in a multiscale context is key in the design and optimization of new or already existing process. The understanding of complex macroscale systems needs to be developed in basis of the underlying microscopic processes which can help understanding all the involved local phenomena.

In this context, a bilateral collaboration University-Industry in an educational framework can shed light about the actual demanded characteristics in a graduate student and can help in adapting the curricula according to these needs. With this aim, a new course entitled Multiscale analysis and computer simulation of chemical engineering processes was implemented in the 2nd year of the MSc. Chemical and Process Engineering at the University of Genova (Italy) starting from the academic year 2017/2018. The teaching was designed to satisfy the demand from both industrial realities and students on the required skills of new graduates. The Project Based Learning (PBL) methodology was applied, and industrial companies actively collaborated in the implementation and evaluation of activities. All projects highly promoted individual responsibility towards a precise objective, teamwork capacity and promotion of technological skills in accordance with current industry requirements. Transversal competencies such as interpersonal relations, development of problem-solving skills and adaptability to new contexts were also encouraged all throughout the experience.

In this work, the impact of the University-Industry collaboration on the student's technical performance and on the improvement of transversal skills will be discussed. The main outcomes will be analysed from the three points of view (i.e., professors, students, industrial collaborators) and the main strengths and weaknesses of the educational strategy will be discussed highlighting the complementary participation of all the actors involved.

REFERENCES

Marzo, M.; Pedraja, M.; Rivera, P. Un modelo de relaciones empresa-universidad. Rev. Eur. Dir. y Econ. Empres. 2008, 17, 39–56.