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Higher Engineering Education by 2020

The world class player on future economy's stage

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Universities' core mission will be to educate graduates and to ensure they are equipped to engage in the process of new knowledge generation, dissemination and application. A genuine "single market" for innovation is needed in Europe. By 2030 an open, fair market for innovation will pull new ideas, talent and investment from around the world. An open, ERA-wide network, online, will provide a simple clearing house to promote ideas and find technologies across borders; networking and visualisation tools will make collaboration easier and cheaper.

Short- and medium-term scenarios and their implementation by University of Miskolc (UM) are presented below:

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- (i) The scenarios integrate • e-university teaching mission implementation by software introduced to orient both academics and students on curriculum, exams, evaluation, time schedule and all other events; • more than 100 engineering textbooks have been prepared and digitised with the provision of easy access, • web-site of the university and departments have been designed, gradually renewed and effective at www.uni-miskolc.hu • contracts have been signed with the city of Miskolc, 160 industry/company/organisations like Chamber of Commerce and Industry, etc. to pave the way for joint co-operation and development, • researchers' nights are organised each year in September since 2005 under the umbrella of "Research in Europe" framework, • establish vital contact with (upper) secondary schools to recruit new entrants to engineering, • exhibitions are organised both for multinational firms and small and medium-sized enterprises to present their products, services and processes and also to take chance to recruit new graduates, offer stipend to students, etc., • academics and students are encouraged to apply for EC grants and various schemes.
- (ii) In the science and research fields • four engineering PhD schools are running also with the objective to generate new knowledge, UM runs four PhD schools in engineering in 3-year-duration as "*I. Sály*" Mechanical Engineering PhD School, "*J. Hatvany*" Information Technology PhD School with the fields of electrical and electronic engineering inclusive, "*S. Mikoviny*" Earth Science and Technology PhD School and "*A. Kerpely*" Material Science and Technology PhD School. • Joint industry projects are running also for knowledge creation and dissemination, • knowledge transfer is carrying out by international microCAD Conference annually, by Students Scientific Forum (TDK in Hungarian) and participation, lecturing and publications at international conferences and professional periodicals.
- (iii) Four centres of excellence are working in engineering to achieve the desired attractive institution status; they are Centre of Excellence on • Sustainable Natural Resources Management, • Applied Material Science and Nano-technology, • Mechatronics and Logistics, and • Innovative Mechanical Engineering Design and Technology.

For the young researchers - PhD candidates and MSc students – with the provision of scientific leaders of high calibre and research infrastructure the project puts direct impact on the scientific quality of respective PhD Schools, the provision of talented students and the new generation of researchers.

University management is in difficult position since Euro 10 million was extracted from the budget within the latest 18 months. If the university is underfinanced, competition will be lost. Hungary is exposed to brain drain at a high degree. One study ranks Hungary 52nd.

The full paper presents the European and Hungarian industry challenges and trends, higher engineering education trends in Europe and University of Miskolc achievements on how to approach the objectives post-2020. ■