

A Debate on Mechanical Engineering Major and Its Cultural Characteristics

Authors:

Hong Wu, Østfold University College, Faculty of Engineering, Sarpsborg, Norway, hong.wu@hiof.no

Mathias Wilichowski, University of Wismar, Department of Mechanical, Process and Environmental Engineering, Wismar, Germany, m.wilichowski@mb.hs-wismar.de

Pavel Belohoubek, Brno University of Technology, Faculty of Mechanical Engineering, CZ 601 90 Brno, Czech Republic, belohoubek@uvssr.fme.vutbr.cz

Abstract— *Mechanical engineering has been an essential major for the traditional engineering education. For the post-second war generation, many business managers, industrial leaders and even governmental top officers were educated within mechanical engineering fields. In a way, this major represented an important aspect, not only in an educational sector, but also in an attentive part of the national economy and political systems for many European countries.*

This status has however, changed a lot for the past few decades, especially for high labor cost countries. The major of mechanical engineering faces huge challenges both in business, industrial and educational sectors. For the industry, the mechanical engineering activities are moving to low labor cost countries. For the education, general interests for this major have been noticeably reduced among the potential applicants for the higher education. The debates and practices on how to handle these challenges are also the important events for many engineering universities.

The current study is a comparative analysis on the mechanical engineering major for three sampled European universities of engineering education (Sarpsborg-Norway, Wismar-Germany, and Brno-Czech). All these three are traditional engineering universities and the mechanical engineering major is/has been their essentially teaching activities. The analysis focuses on their current status, debates, course designs/contents, practices and teaching philosophies on this major and how they handle these challenges mentioned above.

Though mechanical engineering is a standard major for the all, there are still cultural characteristics or practical methods to diversify this standard major in teaching activities. There are also different expectations and requirements from universities or teaching staff to these mechanical engineering students. These differences reflect again, cultural characteristics and current demands from the local industries of these countries. Like other majors, mechanical engineering is not only a standard major by its academic definition, but also a various major in teaching practices depended on its special circumstances around. This variation opens a continual and further debate, in its changing options, availabilities for industrial demands, cultural or national characteristics and global compatibilities, etc.

Index Terms— *Mechanical engineering major, comparative analysis, course designs/contents, cultural characteristics.*