

Meeting the Growing Demand for Engineers and Their Educators 2010-2020

The labor market for engineers has seen noticeable turmoil in the last decade, experiencing growing demand for engineering talent and migration of engineering work to new markets. In some countries, mostly in North America and Western Europe, fewer young people chose engineering as a course of study. In surveys taken there among pre-university students, engineering studies have increasingly been described as “too difficult” or “too long”. In other countries, such as China and India, there was a dramatic growth in the number of students in the engineering disciplines. Yet some doubts were cast about the quality of the large new cadres of engineering graduates in these countries. While the elite universities certainly graduate first rate practitioners, questions are asked on the many graduates who come from lower-tier universities in India and China; are they ready for the technical challenges of transnational and interdisciplinary engineering in the 21st century?

A major challenge to engineering education is the way engineering is portrayed to young students in the pre university system. There is often a notable discrepancy between what future engineers need in their pre university years and what their teachers know and can provide them. Many countries suffer from a shortage of qualified science, technology and mathematics educators at the pre-university level. Quite often science, mathematics and technology subjects are taught by general practitioners with little enthusiasm or insight. As a result, most pre university teachers know little about engineering and engineering design. There are also prevailing stereotypes that are deepened in the pre-university years which discourage women and certain minorities from considering engineering. The result is that many young students never discover engineering as a viable program of study and career choice. Many others make uninformed choices that block their path to engineering studies by the time decisions on university studies need to be made.

These trends are in disaccord with predictions about demand for engineers. Transnational corporations foresee increased needs for engineers and computer scientists almost everywhere, and forecast new opportunities that take advantage of progress in electronic communications and other technologies. There is no lack of planned large engineering projects around the globe, and the pace of innovation and inventiveness in science and engineering continues unabated. The concern of planners and forecasters is that the availability of qualified engineers, and of their early-years educators, may become the limiting factor that will choke the engineering enterprise. Future projects may have to be abandoned because corporations, universities and governments will not be able to find trained personnel to carry them through.

The IEEE, together with other professional organizations, is hosting an international conference on the growing demand for engineers and their educators, and about actions required to meet that demand for engineers and their educators in the period 2010-2020. The conference will be held in Munich, Germany on 9-11 November 2007. Participants will include invited representatives from industry, government, and academia, with a

focus on decision makers and policy makers that can steer the educational system at both pre-university and university levels so that they become more cognizant and more responsive to the anticipated needs for qualified engineers and their educators.

The conference will be data driven. It will center on presenting and analyzing relevant data on the engineering labor markets and the educational systems that train and educate engineers. The primary objective is to develop recommendations to the relevant constituents (school systems, ministries of education, private industry, and engineering and education colleges) based on data and the best available forecasts and projections. The second objective is to improve the dialog and connectivity between the constituents. The looming shortage in qualified engineers and their teachers will not be averted unless industry, government, the pre-university education system and the university system work together across traditional boundaries to meet the challenge.

The conference will feature invited speakers, presentations, panels, breakout groups and a poster session. There will be opportunities for interaction of practitioners and planners from different sectors and regions; an analysis will be developed of what solutions have and have not worked so far; roadmaps will be outlined on how to proceed; and follow-up plans will be announced.

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