

Guest editorial

Building Global Excellence in Engineering Education

Higher education in many countries is in a state of flux and universities have been under pressure to carry out structural reforms in order to become more competitive, as well as generate resources to fund programs. In some countries, where education is turning into a large commercial market, universities have to face competition from other types of educational institutions. Environmental pressures that engineering universities are facing include:

- Intensified competition among universities to attract the best students and faculty members.
- Introduction of selective – typically, reduced funding of the top public universities by federal and state governments.
- Globalization of the competition, often involving multi-national alliances.
- Emerging new technologies used in higher education.
- Greater accountability to government and society.

All universities around the world feel these pressures.

This special issue of Information **Knowledge • Systems Management** is based on a conference, “Building Global Excellence in Engineering Education” that was held at Tokyo Institute of Technology on September 3–4, 2003, funded by the Ministry of Education, Science, Technology, Sports and Culture. To address the issues outlined above, scholars from the top ranking engineering programs in Germany, Japan, Korea, Singapore, Switzerland, United Kingdom, and the United States, as well as representatives from industry, were invited to discuss strategies for building global excellence in engineering education. The goal was to learn about approaches to these issues at the leading institutions in the world and at the same time, to share experiences.

The symposium addressed the following topics:

- The nature of global excellence in engineering education,
- Alternative strategies for building excellence,
- Methods such as the use of IT, forming global networks, etc,
- New models of industry-academia collaboration.

A large audience of over 230 people attended the symposium from academia, industry and government. All presentations were followed by lively question and answer sessions. On the second day, a full session was devoted to a panel session. The two days of intense discussions led to a stimulating, valuable, mutual learning experience.

This special issue includes six articles based on presentations at the symposium. These articles can be briefly summarized as follows:

- Rouse and Garcia discuss the globalization of university-based engineering education and research in terms of the creation of national and international “brands” by leading research universities, and the reflection of this branding in rankings of universities and their programs.
- Ng discusses some of the issues that may affect the formulation of an engineering school’s strategy, alternative strategies, and the difficulties of strategy implementation.
- Miyazaki presents a conceptual model of the factors affecting competence building in an engineering school and illustrates its use with a detailed case study in a Japanese university.
- Shirabe describes the faculty assessment scheme typically used in Japanese universities, the problems with this scheme, and how, in contrast, bibliometric indicators can be used in this assessment.
- Plattner identifies the main success factors in education in engineering and natural sciences, including the selection of faculty, staff, and students, the role of the way resources are allocated, the quality and quantity of infrastructures available, and the institution’s capability of self-reorganization.
- Hoffman suggests reorganizing engineering programs of study into a team approach via a unified lecture consisting of a network of subject micro-modules in different subjects like mathematics and physics.

Beyond their individual contributions, these articles also portray a consensus among authors on the need to have a clearly stated vision statement and leadership from the top, while carrying out execution of strategies “bottom up”. There is also agreement on the need for alignment of the evaluation system with the vision in order to both incentivize faculty behaviors as well as strengthen competence of faculty, staff, and research students.

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