

Facing the 21st Century
—Strengthening the Engineering Education—

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Looking into the 21st century, the whole human society and scientific technology will be developing rapidly. The entire educational system must adapt to the development of the national economy. The modern education should be combined with the modern manufacture on the basis of the modern scientific technology and now this combination seems to be the trend of the development of the engineering education.

In order to foster the students' adaptability to the demands of the 21st century, we should:

I) Improve the teaching approaches, training programs and schooling system. Higher engineering education should be able to meet the needs of promoting the development of industrial technologies. Therefore, Chinese universities need to convert the "limited specialized training" into "broadened and comprehensive specialty teaching system". Courses such as Economics, Management, Modern Biology, Laws and humanities and Social Sciences will be added into the teaching program and take more class hours. By combining the theory with engineering training, the science with humanities studies, we intend to help the students to obtain the ability of social intercourse and the skill of leadership, thus to make the students become more conscious of social and economical problems which are related to the engineering. In accordance with this guidance, we emphasize that the students have the creativity and the ability of self-teaching and life-long study, which together with the essential knowledge of the ideology and approaches of the engineering design, composing the merits of an engineer who is catering to the needs of the future. We believe that after fulfilling this training, the students will become more adaptable and capable.

II) Promote the cooperation with enterprises , set up practice bases and centers of engineering education both inside and outside the university, and foster the students' ability to solve practical engineering problems. We believe that every key science and technology university should establish engineering research and educational training center with the cooperation of enterprises to solve the technical problems in production. In China, some key schools have their own "Silicon Valley" , the scientific and technology zones, to undertake comprehensive research, fundamental research and technological development. For instance, Tsinghua University has built cooperation relations with many important companies and enterprise groups of the world , such as IBM , Whirlpool! Motorola , Hitachi , EMCO and Siemens, etc. The forms of the cooperation are many and varied.

A) Tsinghua University establishes educational and training centers in joint with some world-wide enterprises and corporations.

In order to cultivate high-level technical staff and senior management personnel who master the knowl-



edge of modern manufacturing technology, the Machinery Department of Tsinghua University and the EMCO of Austria jointly established "Tsinghua EMCO Educational Center" in April, 1994. The EMCO provided Tsinghua with the equipment of CNC (computer numeral controlling) and the educational system of CTS (computer training system) valued at **200,000** US. Dollars. With the help of this system, the students can conduct the study of modern manufacturing technology and designing practice on computers and the teachers can examine and correct the students through inter-net. It is a training-practice system that integrated design training and production, and has shown its bright future. At present, the whole system is in full operation.

B) Further develop the cooperation with enterprises and establish the "University and Enterprises Cooperation Committee".

In July, 1995, the "University and Enterprise Cooperation Committee" was established, aimed at seeking a new approach of education. It can benefit both sides: with the help of the member enterprises, the University can put forward its educational reform, promote the quality of the training and provide more high-level personnel; however, the enterprises can directly adopt the latest research achievement to promote their own technological level. Up to now, there are 36 famous enterprises have become its members, and more and more companies are considering to join the Committee. As a committee member, the Jinling Electronics Group of Jiangmen, Guangdong Province, plans to provide the University of 1,000,000 Yuan (RMB) as the fund of Creative Designing Awards for students in 8 years.

III) Improve the quality of the teaching faculty. The Chinese government carries out a policy that encourages capable engineers to join in the teaching of the universities, and at the same time, universities welcome experienced senior engineers of enterprises to be part-time or full-time teachers. furthermore! most of the universities have regular academic holiday for half a year or one year. During this period, university teachers can take up positions in industrial enterprises to do practice. In China, there is a regulation that a doctorate must have one year working experience before he is qualified to be a teacher. Equally, the government too emphasizes international academic exchange, encourages overseas students back to work in the sphere of engineering education, and broadens the scope of international expert exchange.

