

# The Status and Prospects of Engineering Education in China

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## Summary

The author introduces the significant achievements of the engineering education in China in recent years, including the expansion of education scale, changes in educational structures, increase of education investment and improvement of quality, development of educational reforms and the international cooperation of engineering education. The author then summarises the problems and challenges of engineering education in China, including the conflict between supply and demand, students' lack of innovation and practical skills, the incompatibility between current teaching system and engineering profession, and the homogeneous goals and models in different types of colleges and universities. Based on the achievements and problems, the author finally analyzes the future development of engineering education in China.

## Abstract

### 1. Significant Achievements of Engineering Education in China

Engineering education in China has made significant achievements in recently years. The scale of education has been rapidly expanded and a higher education system with wide range of disciplines and multi levels has been gradually formed.

Engineering is the largest discipline in Chinese higher education. There were 2222 institutions that had undergraduate engineering programs in 2011, which accounted for 92.2% of the total 2409 higher education institutions. The enrollment of undergraduate and graduate engineering students were 8.689 million and 0.588 million respectively, both accounting for over one third of the total enrollment numbers. Now the Chinese engineering education is the biggest one in the world.

Positive changes have taken place in educational structure, including huge development in vocational education, covering vocational engineering education. Among the newly enrolled students for colleges and universities in 2010, higher vocational colleges accounted for 47%, among which engineering took 41.8%. In degree education, professional degree was added. Among the graduate enrolment in 2010, professional students accounted for 41%, of which 47% are Master of Engineering.

Investment in education increased by an average of 18% for the past decade, during which campus building, teaching equipment enjoyed a significant increase, thus improving the quality of education. A large number of new majors, new curriculum have been established. Humanities and social sciences have been added to engineering education.

Educational reform, including the teaching model reform and curriculum system reform have been carried out in varying degrees. CDIO and PBL introduced from abroad are used in a number of schools for practice and exploration. Various forms of international cooperation are flourishing.

### 2. The Issues and Challenges of Engineering Education in China

Despite the significant achievement of engineering education in China, there were still many issues and challenges. The contradiction in the supply and demand of talents lies in two

aspects: the total number of students and the structure. A prominent problem is that while university graduates from many majors have difficulty in finding jobs, the society is in desperate want of practical talents, especially skilled talents. Part of the reason is that the development goals and models of colleges and universities tend to be homogeneous—trying to compare themselves to top universities without considering their own reality.

Due to the large student base, huge contrast exists between practice requirements and conditions for both inside and outside school. The science knowledge oriented teaching model is not suitable for engineering education. Most of the teaching reforms are still in the exploratory stage, resulting in students' weak practical ability and unethical behaviours.

### **3. The Development Prospects of Engineering Education in China**

As China's economy and society develops, education, including engineering education, will gradually overcome the existing problems and better adapt to the demand of modernization. Government, society, schools and other parties need to work in concerted efforts. Government should to change the way of school management, the society (including businesses) should further clarify their demand for talent, send out clear guidance signals, while providing students the opportunity to practice. Schools should deepen educational reform, mobilize the teachers and students and overcome the tendency of administrativization. As long as all parties coordinate their efforts, China's engineering education will surely make greater achievements.

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