



ISCLab

The Development and Reform of Chinese Higher Engineering Education in Information Science and Technology



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I. The Higher Education System in China



The Higher Education System in China

1. **The Ministry of Education (M.O.E.) is a central government agency under the state council, responsible for Chinese educational undertakings.**
2. **The Department of Education of the provincial governments is responsible for the provincial educational undertakings.**
3. **Universities are managed and funded by the central government (Ministry of Education and other organizations under the state council). There are key universities in China, and they have complete educational degree programs.**

The Higher Education System in China

4. **Parts of the universities, managed and funded by the provincial governments, have the graduated programs. Note that in China all doctoral programs must be approved by an academic committee organized by M.O.E., and all master programs must approved by an academic committee organized by the provincial government.**



The Higher Education System in China

5. **Non-public colleges are the higher education institutions which are non-profit organizations. They undertake the training of practice-oriented talents and they do not offer graduate programs. Parts of them are vocational education. Some of the key universities are encouraged to establish their own independent colleges. The key university conducts the teaching work but the college is managed by a board of the college, and the tuition of these colleges is the double of that of the public universities,**



The Higher Education System in China

6. **Higher vocational education institutions are the tertiary level of vocational education, and they undertake the training of practice-oriented and craft-oriented talents.**
 - o **At present in China, institutions providing tertiary vocational education are divided into four categories. The first is the higher vocational technology institutions. The second is the 5-year higher vocational classes provided in the regular specialized secondary schools. The third is the tertiary vocational education provided in some regular higher education institutions and adult higher education institutions. The fourth is the reformed regular institutions offering 2 to 3 year higher education with the emphasis on training practice-oriented talents.**

The Higher Education System in China

7. **Note that vocational education in china is provided at three levels: Junior secondary, senior secondary and tertiary. The students who graduate from the vocational education are warmly welcome by the society, especially those from the senior secondary and tertiary.**
8. **Adult higher education has been rapidly developing. Among the 2000 higher education institutions, 1400 are regular HELS and the other 600 are higher education institutions for adults.**



II、 The Development and Reform of Higher Education



The Development and Reform of Higher Education

- In recent years (in information science and technology),
 1. There are all together 2003 Higher Education Institutions (HEIs), among which 1396 are regular HELs. The others are higher education institutions for adults. The total number of new entrants admitted by and the total enrollment of the HELS were 3,205,000 and 9,033,600 respectively. The total number of graduate students newly admitted by HELS and research institutions was 202,600 among which 38,400 were for P.H.D and 164,200 for master degrees. The total enrollment for graduate students was 501,000 in 2007.



The Development and Reform of Higher Education

2. **The fees charging system for students is: All students should pay a reasonable amount of money for their own higher education (the tuition is about 900 U.S.D per year). Simultaneously, a scholarship system is intended for excellent students both academically and morally. In practice is the loan, the stipend and the part-time job systems for students whose families have economic difficulties, ensuring that none student will lose their opportunities to attend colleges or universities because of economic reasons,**



The Development and Reform of Higher Education

3. In 1994, the M.O.E launched the “Reform of Teaching Contents and Curriculum of Higher Education in Face of the 21st century.” This plan covers all areas of higher education such as teaching ideology, teaching contents, curriculum structure and teaching methodology. Several years later a large number of teaching reform achievements showed up, some of which were awarded the National Teaching Achievements Awards organized and implemented by the M.O.E.



The Development and Reform of Higher Education

4. **Since 1994, a big project (The 211 Project) was launched and at the present time, the 211 Project has been developing into its third phase (The number “211” mean the in the 21st century, 100 key HEIS will be substantially financed by the central government).**
5. **There has been a special program called Chang Jiang program which is open to the world, inviting Chang Jiang special professors and lecturing professors to work in HEIS, whose number totals 220 to 260 persons per year.**



The Development and Reform of Higher Education

6. **For the purpose of encouraging students to apply their basis knowledge in practice, M.O.E. holds contests for undergraduate student all over the nation and awards the excellent students who participate in Mathematic Modeling、 Electronic Design Contest for students. Tens and thousands of students join in these contests each time.**



The Development and Reform of Higher Education

7. **The central government sets up big research projects such as 863 Project, 973 Project and Natural Science Foundation etc. and encourages research institutions, facilities of HEIS and enterprises to join these projects via competition, Therefore, many professors lead their research groups, including their PHD students, to join in these projects. All the achievements, including those transferred into the enterprises involved in these projects strongly support the development of China.**



The Development and Reform of Higher Education

8. **In the applied basic research and basic research field, faculties of HEI are very interested in the most advanced developments of the important science and technology. Many professors are engaged in the researches into quantum electronic, quantum photonics, quantum information, semi-conductor electronic, laser electronic, Tera Hertz electronic, optic memory and storage, optical fiber sensor technology, high performance computing, etc. Most of these programs are supported by the National Natural Science Foundation.**



III、 Further Reforms in Universities



Further Reforms in Universities

1. **Deep reforms are matched closely with the idea: Computational science is one of the principal bases for the development of human society in the 21st century. “Computational Science” is the utilization of the advanced computing to solve the complex problems in human society.**
 - **The practical procedure of computational science in common, – Modeling – to find out the algorithm – to select the computing platform – the computing – to revise the results, modeling, algorithm – to confirm the results.**
 - **The implementation of the computational science raises the requirements for high level talents and connects to the new mode of the talent training in higher engineering education.**
 - **The specialty of the talents who are engaged in computational science is demanding a broader multi-discipline capability, which comes from the training mode of the new discipline construction. It is a very hard work to build up the new discipline construction.**



Further Reforms in Universities

2. **The consideration of the reform is related to “C. D. I. O” mode in higher engineering education.**
 - **“C. D. I. O” means conceive – design – implement – operate. It is an advanced R&D mode of the production in industry.**
 - **In recent years, some distinguished professors implement the “C. D. I. O” mode for the reform of higher engineering education to promote the qualities of the students trained for industries.**
 - **There is also an international organization which studies “C. D. I. O” mode in the reform of higher engineering education.**



Further Reforms in Universities

- 3. The reform of graduate student training mechanism is intended to promote the qualities of students. The purpose of this reform is to encourage students to do their best in study to pass the academic selection, which will change the situation in China where, after the entrance examination and several years' study, a graduate student can usually get his or her degree. Though graduate students are very good in undergraduate study and the entrance examination is very strict, it is unreasonable for all the students to graduate without selection. This year will start a similar reform for PH.D students.**



THANKS!