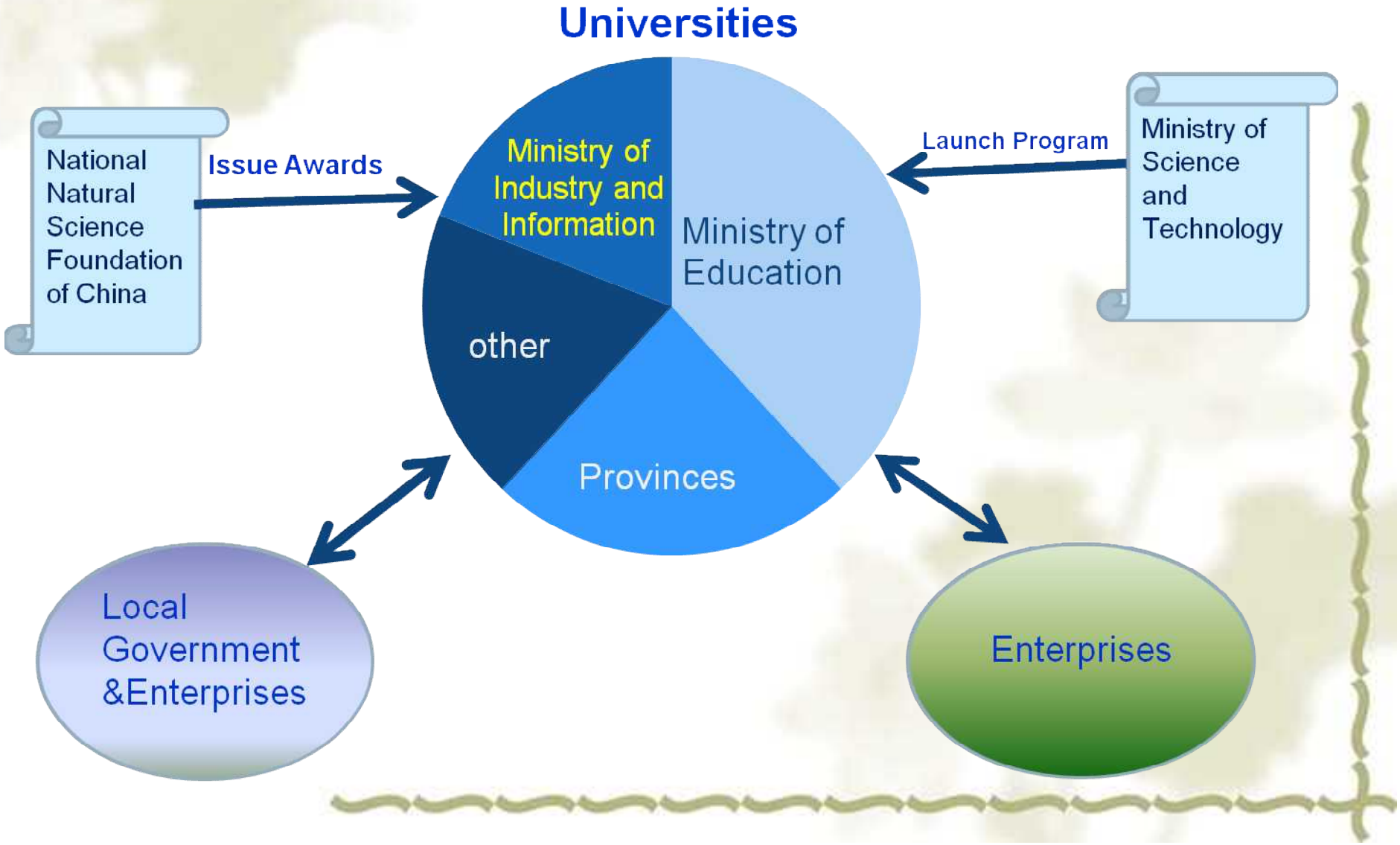
The Practices and Challenges of Scientific Research Achievements Transformation by Chinese Universities

Zong Wa
China Education Association for International Exchange (CEAIE)
Jan. 28, 2011

1. The National Policies on Transformation of Scientific Research Achievements
2. The Transformation of Scientific Research Achievements into production by Chinese Universities
3. Case Studies--Some Successful Practices and Experiences

Ⅰ. The National Policies on Transformation of Scientific Research Achievements

The major players in field of transforming scientific research achievements in China



National Priorities

- The 4th National Summit for Cooperation of Industry, University & Research, Policy Makers was hold in Beijing Dec.22, 2010.
- National leaders pointed out: With the fundamental market force, and guidance and promotion by the government, we need to make efforts to further explore more resources, create platform for innovation, experiment new mechanism.
- It is the trend to strengthen cooperation between Industry and universities, to create the national innovation system.
- Cooperating with universities and research institutions, the enterprises will be the major players with the orientation of the market

In order to promote commercialization, industrialization and internationalization of innovative achievements and help enhance the innovative ability of enterprises, The China Industry-University-Research Institute Collaboration Association was established jointly by National Development and Reform Commission, Ministry of Education, Ministry of Science and Technology, Ministry of Industry and Information, Ministry of Commerce, Commission for State-owned Property Management, State Bureau of Intellectual Property, Academy of Science, Academy of Engineering, Some top universities, research institutes, and enterprises.

In the Summit, the “Zhong Guan Chun Declaration” was reached, and it says:

We need to follow the trend of the development of world science and technology as well as economy;

To promote strategic alliance for industrial technology innovation and establish platform to provide service to scientific and technological innovation ;

To implement strategy of promoting intellectual property and branding, to upgrade the technology of industry and development of strategic new industry;

To develop new models, mechanism, incentive for innovation of science and technology

To encourage universities to involve in process of innovation and development of cutting edge technology, and cultivate innovative talents

To encourage the governments at all levels to purchase and support scientific research achievements

To speed up the process of passing the law of “Promotion of cooperation of industry and research institution”

II. The Transformation of Scientific Research Achievements by Universities in China

Facts and Figures

With the development of Industry-University-Research Institute, Chinese universities play the very important and major role in this area. Universities have

- 63% National Key Research Labs
- 39% National Engineering Research Centers
- 27% National Engineering Technology Research centers
- 33% National Engineering Labs
- 70% National Technology Transfer Centers
- 69 National University Science Parks

Facts and Figures

- Funding—The Statistics by MOE in 2008 show us that the total amount of money for scientific research in universities is about 65.45 Billion RMB. Half of them are from local businesses, enterprises and government agencies.
- Human Resources—There are more than 390,000 research fellows, among them, 340,000 are involve in research and development.
- Awards—47% awards of Natural Science Foundation are from universities
- 81% awards for Technological Invention(all the first class awards) are from universities
- 38% awards for Scientific and Technological Development are from universities

Models of Transformation

There are major four models of transformation of scientific research achievement in Chinese universities. They are:

- Establish his/her own enterprise to transform scientific research results to production;
- Establish joint-venture with industry. The scientific research results are counted as technological shares of the company.
- Incubator—Service center for innovations.
- Technology Transfer Market—Direct transfer or indirect transfer.

Problems and Challenges

- The industrialization and commercialization of scientific research achievements are difficult for Chinese universities. There are more than couple of ten thousands of new technologies developed by universities, only 25% are transferred. A little more than national average, 10%-15%. Much lower than the average of developed countries, 60%-80%.

The factors from the industry:

- lack of professional services and system support for technology transfer;
- lack of incentives and motivation from industry;
- The relevant information and personnel management and technology market need to be improved;
- Lack of funding to reduce the risk of innovation and new technology transfer

Problems and Challenges

The factors from the universities:

- More attention to research than application or transformation
- More attention to academic than practical technology
- The service, supporting platform and management of scientific research are week and not coordinated
- Current personnel management system, and incentive mechanism are not in favor of technology transfer;
- There are no professionals help transform scientific research achievements.

Problems and Challenges

The factors from the universities:

- More attention to research than application or transformation
- More attention to academic than practical technology
- The service, supporting platform and management of scientific research are week and not coordinated
- Current personnel management system, and incentive mechanism are not in favor of technology transfer;
- There are no professionals help transform scientific research achievements.

Strategy of MOE

- Establish open cooperative model to encourage universities to transform their scientific research achievements on their own initiatives
- Establish Office for Management of Intellectual Property and Technology transfer to provide services and support for researchers
- To widen the cooperation between universities and local governments, as well as to deepen the cooperation between universities and enterprises to promote technology transfer.
- Reposition the function of Sci-Tech enterprises owned by universities to promote social and economic development.
- The Blue Fire Project by MOE: Identify some regions with particular, innovation initiative, and special feature industry, organize universities to go to learn the needs and help enterprise upgrade technology, transform their scientific research achievements to production, and finally enhance the competence of the regional economy.

Ⅲ. Case Study—some successful experiences and practices

University-Enterprise Cooperation

- Case 1: Central South University goes out to work with more than 30 domestic and foreign big companies, and jointly established the “China United Lab for Aluminum Industry”. It helps upgrade the technology of aluminum industry of China
- Case 2: Beijing University of Science and Technology are exploring to integrate applied technology, industrialization of new technology, and development of new technology with each other to transform engineering research achievements to Steel Corp.
- Case 3: Tsinghua University effectively promoted China-Russia cooperation in the field of security technology. The university imported the core technology, digestive absorption and re-innovate, then integration of the whole set of technologies and industrialization, then finally sale to the international market.

University-Regions Cooperation

- Case 1: Hebei University of Agriculture has worked with rural areas for more than 20 years. The university is doing research on the technology to increase production of the grain, and help farmers to become rich.

- Case 2: Ningbo University has been doing scientific research according to the development needs of the local economy. The university helps Ningbo City to enhance its competence of the core industry.

- Case 3: Shanghai Jiaotong University started from the establishment of national standards of digital television, and has done research on core technology of digital TV. So far the university owns the intellectual property and applied its technology to 40 cities of 10 provinces.

University Science Park

By the end of 2009, there are 69 national university science parks. They have incubated a lot of High-tech enterprises and played very important role in transforming the scientific research achievements, and cultivation of innovative talents.

More than 1000 research institutes have moved into the parks, and about 6574 enterprises are being incubated.

There are also more than 40 pioneer parks for returning graduates from abroad, and 11 pioneer bases for college students. There are about 6000 results transferred, 130,000 employment opportunities,

1958 enterprises have graduated, with more than 30 have been enlisted in the stock markets.

Tsinghua University Science Park is one of the best parks.

Tsinghua University Science Park

Only one Class A University Science Park in China.

1000 enterprises have been incubated, with more than a few hundreds of core technologies.

More than 30,000 researchers.

About 1500 patents have been approved each year.

Total turn out is 40 billion RMB.

It has been well-known base for incubator, base for cultivation of innovative talents, and base for transforming scientific research achievements.

Province-Ministries Cooperation

34 Innovation Unions has been established in the fields of electronic information, digital equipment, electrical appliance, etc. to solve common technical problems. There about 56 national key universities, 36 research institutes, and 440 Guangdong enterprises involved in.

For the past 5 years, Guangdong provincial government has spent 0.25 Billion RMB to support the development of those unions. Local government agencies has invested 2 billion RMB. Those unions have solved technological problems in clean production of pottery and porcelain, digital machines, and electronic information technologies.

3451 special sci-tech representatives from 230 universities take 10,000 students to go to 2400 Guangdong enterprises to help promote technology innovation. In 2009, The Ministry of Science and Technology and Guangdong provincial government have supported 20 million and 130 million RMB.

It helps Guangdong rank 2nd for Comprehensive Capability of Innovation

About CEAIE

- Founded in July, 1981, approved by the State of Council of China
- The China's nationwide not-for-profit organization conducting international educational exchange
- The headquarter of CEAIE is in Beijing. The executive body of CEAIE is the Secretariat which is under the direct guidance of the Ministry of Education of China
- Registered with the Ministry of Civil Affairs of PRC as the national NGO

About CEAIE

- Granted Special Consultative Status with the Economic and Social Council of the United Nations in July,2006
- Granted the Associated Status with the Department of Public Information of the United Nations in 2008
- There are local educational associations in 31 provinces, autonomous regions and municipalities as well as other cities
- There are 149 member institutions
- Establishing long-term working relationship with over 170 educational organizations in more than 50 countries and regions

Thank You!

and

Happy New Year of Rabbit !

zongwa@ceaie.edu.cn