Innovative Training Based on Student Needs

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Outline

1 Changing social needs

2 Well-organized training

3 Individually-tailored study

4 Systemic innovations

1. Changing social needs

With social and economic development, social needs for higher education have changed

"National mid- & long-term education development plans"

- Φ Higher education in the process of being popularized

Year	2002	2006	2009	2015	2020
Rate of gross college enrollment	15%	22%	24.2%	36%	40%

- Φ Diversified needs on the part of students and their families
- Φ Diversified needs for talents demanded by social changes

USTC offers well-organized, individually-tailored training to meet changing social needs

2. Well-organized training

1. First-class scientists

- Φ China's strategic need for "empowering the nation through science and technology and talent cultivation"
- Φ Fostering world-class leaders in basic sciences
- Φ USTC's tradition of training first-class scientists
  - 29 of USTC graduates are academicians of CAS, and 21 APS fellows
  - "Plans for training top-notch students in basic disciplines"
  - CAS "programs for cultivation of top scientists and engineers"

2. Well-organized training

- **Under a partnership framework, USTC and relevant CAS research institutes have jointly set up seven talent classes for fostering first-rate scientists**

Talent classes	CAS Partners
Hua Luogeng class of mathematics	Math & system science research institute
Yan Jici class of physics	Physics research institute
Bei Shizhang class of life science	Biophysics research institute Life science research institute
Talent class of mechanics	Mechanics research institute
Lu Jiaxi class of chemistry	Chemistry research institute Organic chemistry research institute
Talent class of astronomical science & technology	State observatory, Purple mountain observatory, Shanghai observatory
Zhao Jiuzhang class of modern earth & space science & technology	Geology & geophysics research institute

2. Well-organized training

2. Research engineers

- **National programs:**
  - **An innovative nation to be built by taking a new Chinese-style approach to industrialization and training large numbers of talented people**
  - **Research engineers as a main force in technical innovations and technological transfer**
- **USTC's tradition of integrating theory with practice and science with technology**
  - **Remarkable success in providing in-depth engineering education based on solid study of basic theories**
  - **Among USTC graduates, there are 16 CAE academicians, more than 20 generals and numerous top technical personnel in China's armed forces, 1 academician of US National Academy of Engineering, & over 20 IEEE fellows**

2. Well-organized training

- **Under a partnership framework, USTC and relevant CAS research institutes have established four talent classes for training high-caliber research engineers**

Talent classes	CAS partners
Wang Daheng class of mechanical & electrical eng.	Changchun optics, precision machinery & physics research institute
Zhao Zhongyao class of applied physics	Shanghai applied physics research institute
Talent class of materials science	Metal research institute
Talent class of computer & IT	Computing tech research institute, Electronics research institute

2. Well-organized training

3. Outstanding people in various fields

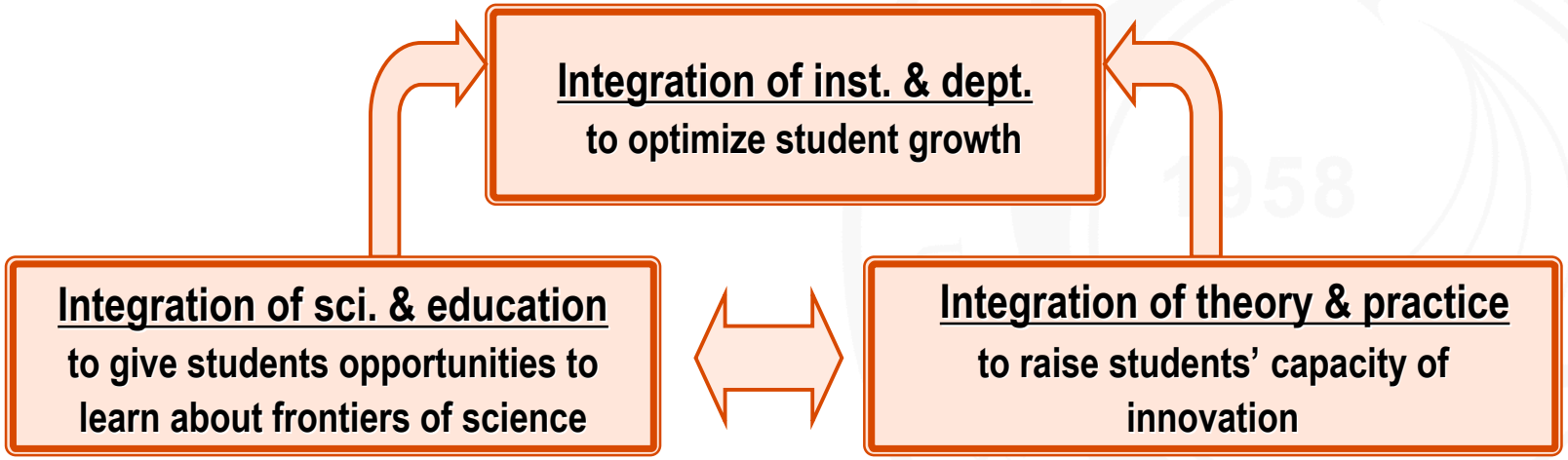
- **In addition to its ideal of being a first-class university and cultivating top-notch talents, USTC is also devoted to training various types of outstanding people**
  - **Zhang Yaqin, former head of Microsoft Asian research inst. & VP of Microsoft Global**
  - **Deng Zhonghan, CAE academician, chairman of Vimicro**
  - **Chen Yilong, IEEE fellow, chief scientist of GM Asia & Pacific**
  - **Chen Xiaowei, President of Peoplexz.com**
  - **……**

3. Individually tailored study

USTC provides individually-tailored study to overcome shortcomings of "mass-production type education" and meet different needs

1. Talent classes

- **11 talent classes set up in collaboration with CAS research institutes**
- **Three types of integration in a talent class**



3. Individually tailored study

Φ Aims of training

- Providing students with a solid foundation in math & physics, mastery of research methods, creative mentality & innovation skills, whereby they will become first-class scientists or research engineers in 15-20 years

Φ Student admission

- At the end of 2nd year, outstanding students are selected from various depts. for the class which is under dynamic rolling management

Φ Form of training

- Most basic courses are taught at USTC
- Freshman & sophomore year studies are pursued in original depts.
- Talent class training starts in the junior year by specific schemes
- Workshops/lectures are given by experts from partner research institutes
- Seminars/research projects for student participation at research institutes during vacations
- Specialized courses, research or thesis preparation at research institutes in senior year

3. Individually tailored study

2. Flexible curriculum design

- Φ **Optimally layered, flexibly-designed curriculum to provide for most suitably personalized study**
- Φ **Uniform requirements for basic courses**
  - ⎫ **Generally required courses adapted to different disciplines**
- Φ **Flexible setup of specialized courses**
  - ⎫ **Joint teaching in cooperation with experts from research institutes, industries and various organizations**
- Φ **Enriched learning across disciplines**
  - ⎫ **Encouragement for multidisciplinary studies**

4. Systemic innovations

1. University-wide reselection of majors in the 1st year

2. Free switch across majors

3. Advisors appointed to provide academic guidance

4. Individually-designed study schemes

- **Students may design suitable learning schemes according to their own abilities and interests under the guidance of their advisors**

5. Criterion of graduation set around core knowledge

- **A non-major student may be eligible for a degree in any specialty once he/she has fulfilled the credit requirements for that particular specialty**
- **Qualified students of talent classes are awarded with honor certificates**

Conclusions

- New needs and challenges for universities along with social changes
- Well-organized, individually-customized training in accordance with students' abilities
  - Directions of specialization
  - Curriculum system
  - Methods of study
  - Research practice
- System assurance

Many Thanks!