Doctoral Education Quality Assurance System of Shanghai Jiao Tong University

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Basic Information of Doctoral Education

- 1926, established the first research institute.
- 1931, began training graduate students.
- 1978, restarted graduate program, and recruited 157 students.
Basic Information of Doctoral Education

- Enrolled PhDs of 2014: 1557
- Awarded doctorates last year: 1176
- Doctoral fields: 39

SCALE
Basic Information of Graduate Education

- National Excellent Doctoral Dissertation Awards: 38, Nominations 76
- SCI ranked 2 (4147), EI 4 (2187), SSCI 4; Graduate as first author: 70%+
- Innovative mechanisms and initiatives to improve the quality of doctoral training. Second prize of the National Teaching Award in 2014
### Basic Information of Graduate Education

#### DISCIPLINE

<table>
<thead>
<tr>
<th>Round Rank</th>
<th>First Number of Discipline</th>
<th>Second Number (National rankings)</th>
<th>Third Number (National rankings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top one</td>
<td>2</td>
<td>3 (5)</td>
<td>3 (7)</td>
</tr>
<tr>
<td>Top three</td>
<td>5</td>
<td>6 (8)</td>
<td>9 (6)</td>
</tr>
<tr>
<td>Top five</td>
<td>13</td>
<td>13 (6)</td>
<td>15 (6)</td>
</tr>
<tr>
<td>Top ten</td>
<td>14</td>
<td>23 (4)</td>
<td>29 (4)</td>
</tr>
</tbody>
</table>

- 22 fields enrolled QS rankings, top 3 in China
- 16 fields entering the ESI world's top 1%, Top 3 in China
- Stopped 13 degree authorizations
Basic Information of Graduate Education

**ARWU**: Jump from 461 of 2004 to 146 of 2014
Basic Information of Graduate Education

ARWU (Global Ranking)

- Engineering: Top 30
- Science: Top 150
- Life Science & Medicine: Top 200
- Social Sciences: Top 300

Disciplinary framework of comprehensive university with international influence basically formed
Major achievements

- **Selected SCIENCE World's Top Ten Scientific Breakthroughs for two consecutive years**
- **6 results selected the top ten technology progress of Chinese university for the past six years**
- **NSFC grants**: Top 1 in recent five years
- **National Awards**: accumulated ranked second
- **2011 Plan for Collaborative Innovation**: 3 centers recognized in 2014
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II. Quality Assurance System of Doctoral Education

Doctoral Training Quality Assurance System

- A set of scientific quality assurance system from enrollment to dissertation review.
- Strengthen the training process management, focus on institutional incentives, enhance self-development enthusiasm both advisor and PhD.

Recruit
- Admission by application
- Quality of students

Training
- Hiring advisor dynamically
- High-quality course construction
- Multidisciplinary training

Dissertation Review
- Double-blind review
- Overseas review
- International defense
Breakthrough of Graduate Admissions

- Students enrolled by *Application, MD-PhD or Bachelor-PhD* gradually increased. It makes up 57% in 2014.

*Admission by application (since 2008)*

- More authority to schools and advisors
- Focus on research capacity, innovative thinking and the development potential
Reform of faculty management system

1st: recruit and mentor junior staff
2nd: three career tracks for faculty
3rd: one merged tenure system

By Jie Zhang
President of SJTU

Excellent faculty

Formed talents pyramid system, attracted more than 450 international well-known scholars since 2007
## II. Quality Assurance System of Doctoral Education

### Excellent faculty

<table>
<thead>
<tr>
<th>Title</th>
<th>2006</th>
<th>2014</th>
<th>Increasing ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhD</td>
<td>55.1%</td>
<td>80.24%</td>
<td>+25.1%</td>
</tr>
<tr>
<td>Overseas PhD</td>
<td>5.9%</td>
<td>21.73%</td>
<td>+15.8%</td>
</tr>
<tr>
<td>Academicians</td>
<td>32</td>
<td>40</td>
<td>125.00%</td>
</tr>
<tr>
<td>Thousands Talents Program</td>
<td>-</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>Major national sci. research plan(973) PI</td>
<td>11</td>
<td>47</td>
<td>427.27%</td>
</tr>
<tr>
<td>Outstanding Youth Fund winners</td>
<td>41</td>
<td>101</td>
<td>260.98%</td>
</tr>
<tr>
<td>Cheung Kong Scholars</td>
<td>48</td>
<td>117</td>
<td>243.75%</td>
</tr>
<tr>
<td>Youth thousands talents/gifted youth/top-notch youth</td>
<td>-</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>NSFC innovation group</td>
<td>2</td>
<td>10</td>
<td>500.00%</td>
</tr>
</tbody>
</table>
Ⅱ. Quality Assurance System of Doctoral Education

Top faculty

- US Academy of Sciences & Engineering: Zhu CHEN, Jie ZHANG, Zhiming HO
- Foreign Fellow of the US National School of Medicine: Zhu CHEN, Xiaoming SHEN
- Foreign Fellow of Royal Academy of Engineering (UK): Jie ZHANG
- Foreign Fellow of the French Academy: Zhenyi WANG, Zhu CHEN
- Foreign Fellow of the French National Academy of Medical Sciences: Saijuan CHEN
- Academician of German Academy of Sciences: Jie ZHANG

Hundreds of people elected Fellows of important international academic organizations, e.g. IEEE
Advisor selected dynamically (since 2008)

- **Strengthen responsibilities:** each qualified faculty can recruit students.
- **Relax title requirement:** academic level and research activity are main considerations.
- **Schools autonomy:** schools set self-standards.

<table>
<thead>
<tr>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>1365 Senior, 88%</td>
</tr>
<tr>
<td>154 Assoc. Prof., 10%</td>
</tr>
<tr>
<td>30 Junior, 2%</td>
</tr>
</tbody>
</table>
Cultivating system from undergraduate to graduate

- Academic master's degree gradually incorporated into doctoral training system.
- Complete the first phase construction.
Ⅱ. Quality Assurance System of Doctoral Education

**Improve doctoral training program**

- Train PhD according to discipline, and have revised doctoral training program systematically.

- Focus on building the core curriculum group, increase the number of doctoral courses given in English.

- Strengthen doctoral qualification examination system (e.g. approx. 10-15% failed).
Ⅱ．Quality Assurance System of Doctoral Education

University-enterprise joint training programs

- Enterprise engineers act as the first advisor, with professors from SJTU being the secondary one
- Industry-University-Institute interactive mechanism
- Promote the establishment of postgraduate joint training base in Shanghai

And so on...
II. Quality Assurance System of Doctoral Education

Interdisciplinary Training

Found new inter-disciplinary institutes

- **Institutes**: Med-X Research Institute, Institute of Arts and Humanities, Institute of Nature Science, Ocean Research Institute.
- **Platforms**: Biomedical Engineering Platform, Statistics Platform...
- Establish Inter-disciplinary Advisory Committee, Degree Evaluation Committee.
Platform of biomedical engineering

- Advisors from different disciplines cooperate on same research program (engineering, medicine and science, medical) can recruit PhD students.
- Set up flexible, personalized training program for each student.
- Dissertation topics should be based on inter-disciplines.
Dissertation review

- Dissertation review system:

  - Pre-defense
  - Double-blind review
  - Peer review
  - Defense

- Dissertations falling within the bottom 10% should be reviewed by the Degree Evaluation Committee.
Dissertation review

Three-level degree evaluation system: school-faculty-university
Dissertation reviewed by overseas experts

- International experts review and oral defense:

  Invite experts from world-class universities to review the dissertations, which evaluate dissertation in an international standard, enhanced the quality of dissertation as well as students’ international academic competence.

- Dozen doctors became faculty in overseas universities: e.g.

  Dr. Qian Lulu is working at CalTech as an assistant professor;

  Dr. Zhao Wenhua is working at University Western Australia as an assistant professor, etc...
## International exchange

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overseas graduate students</td>
<td>546</td>
</tr>
<tr>
<td>Foreign teachers</td>
<td>150</td>
</tr>
<tr>
<td>International research projects</td>
<td>230</td>
</tr>
<tr>
<td>Domestic students went abroad (13-14 academic year)</td>
<td>518</td>
</tr>
<tr>
<td>International visiting students (13-14 academic year)</td>
<td>720</td>
</tr>
<tr>
<td>Dual degree program</td>
<td></td>
</tr>
<tr>
<td>25 programs, with Paris Tech, Georgia Tech, Univ. Leuven, TU Berlin, Paris 6, etc...</td>
<td></td>
</tr>
<tr>
<td>International exchange and cooperation program</td>
<td></td>
</tr>
<tr>
<td>Asia Campus project, U21, and C9-Go8 etc...</td>
<td></td>
</tr>
</tbody>
</table>
II. Quality Assurance System of Doctoral Education

Academic activities

- Academic innovation activities: Master Forum, Doctoral Forum, Graduate Summer School.

- Summer School: provide 15 international programs, 28 courses were given by foreign professors.
III. Thoughts and the path forward

Idea of Doctoral Education

- **Three concepts** of doctoral education: knowledge exploring, capability building, and personality developing

- **Current core task** is to improve the quality of doctoral education

- **Build doctoral training system** to concentrate on their growth and future success
Ⅲ. Thoughts and the path forward

Promote in-depth reform of doctoral education

- **Deepen doctoral advisor selecting system reform**
  
  Implement the existing university-wide incentive system to motivate all faculty

  Develop the advisor system with path of tenure system

- **Encourage group tutoring**
  
  Provide group tutoring for doctoral students, especially for inter-disciplinary students
III. Thoughts and the path forward

Promote in-depth reform of doctoral education

- Develop the linking of undergraduate and graduate education system, maintaining pathways to graduate school for promising undergraduate students who have the interest and potential to pursue graduate training.

- Focus on providing both fundamental and cutting-edge courses, utilize information technology to ensure doctoral courses are consistent with the latest scientific research.
III. Thoughts and the path forward

Promote in-depth reform of doctoral education

- **Further improve the monitoring system of graduate education quality**, highlight qualifying examination and thesis proposal, make doctoral training system comparable to world-class universities.

- **Frame elimination system of doctoral completion**, improve doctoral qualifying examination system, provide the path for failed doctoral candidates to turn to study for master degree.
Ⅲ. Thoughts and the path forward

Promote in-depth reform of doctoral education

- **International impact of students cultivation**, Continuously improve the current cultivation system to welcome more and more international students to pursue doctoral degree at SJTU. Meanwhile, we strongly wish to establish dual degree program with top institutes.

- **Professional doctoral degree candidates cultivation**, Deepen cooperation with enterprises and local government to improve candidates' practical skills.
Ⅲ. Thoughts and the path forward

Vision of doctoral students education

- global level faculty and students
- a strong inter-cultural and innovative education system
- keep research and doctoral education up to the global trend
- several disciplines reach the top level of the world
Thank you!