# Up and coming?

## Doctoral education in China

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In line with China's massive leap forward in higher education since the late 1990s and its ambitious bid for world-class universities within decades, doctoral education has been strongly, and arguable strategically, promoted by the Chinese government. During the past four decades, China quickly established a national system of academic degrees and postgraduate education since the early 1980s. Its doctoral education has since grown fast to become one of the largest in the world. While the developmental process deserves much commendation, it was never short of twists and turns. The extraordinarily fast growth has particularly led to a variety of problems that have evoked controversy in China, especially over the widely perceived decline of quality in doctoral training. In view of a lack of literature in English on Chinese doctoral education, this article attempts to provide an analytical review of China's current practices as well as some issues and challenges faced by the system in meeting societal needs and future development.

### Introduction

Doctorate holders represent a crucial human resource for research and innovation. As a site for the production of new knowledge and new knowledge making practices, doctoral education has recently become 'a matter of increasing interest and concern' in many parts of the world (Lee & Green, 1995, p. 2), as a consequence of educational reforms. In China, postgraduate education is a borrowed concept from overseas (Wu, 2009). The Chinese system of academic degrees and postgraduate education was only formally established in the early 1980s.[1] Their growth, however, has been by leaps and bounds. The Chinese doctoral education system has swiftly become one of the largest in the world. Within this fast growing period, there has been no shortage of twists and turns, as well as costs and benefits, from institutional arrangement, administration and procedure, protocol and policy, finance and governance, to supervisory practice, and learning experience. While there has been an increasing body of literature within China on doctoral education, few studies have appeared in English. Recent exceptions are by Peter S Li, Liming Li and Li Zong (2007) and Yandong Zhao and Dasheng Deng (2011), respectively on the educational aspirations and occupational orientation of Chinese doctoral students. Aiming to delineate a detailed picture of the current practices of China's doctoral education, this article covers its stages of developments; disciplinary, institutional and regional distributions; thesis quality; supervisory practices; and the employment of doctorate holders.

### Development

Immediately after the Cultural Revolution (1966-1976), China faced devastating shortage of professionals. With strong support from the central government, postgraduate education was quickly resumed in 1978. By 1980, enrolled postgraduate students totalled 22,000. Meanwhile discussions on establishing China's academic degree system were underway. A work committee was set up in March 1979, chaired by the then Minister for Education, Jiang Nanxiang. *The Regulations on Academic Degrees of the People's Republic of China* was issued in February 1980. The first batch of 18 doctorates was conferred on 27 May 1983. Since then, doctoral education has grown significantly in China (Wu, 2009). While higher educa-

tion institutions are the mainstay, doctoral training is also practiced at academies of research at national, provincial and regional city levels, in some military institutions and at Party schools. The past three decades could be divided into different stages of development.

The first was between the end of the 1970s and the early 1990s, centred on making full use of the limited number of the nation's experts including returned scholars from overseas and those who received highly specialised training during the 1950s to establish a doctoral training system. Delegations were sent overseas to gain external experience. It was reiterated that Chinese doctorates should have similar quality with their foreign equivalents. Among the first batch of applications for doctoral programmes and supervisors, only 3/5 and 1/2 of them respectively were approved. There was tight control from the central government over quality. For example, the first batch approved nationwide in 1981 included 151 institutions, 812 programmes and 1,151 supervisors. The second batch in 1984 only added 45 institutions, 316 programmes, and 183 supervisors. The third batch in 1986 and the fourth in 1990 added respectively 41 and 10 institutions, 675 and 277 programmes and 1,791 and 1,509 supervisors (Guo, 2009, p. 22). Thirty-three universities were allowed to experiment by the Ministry of Education to build their graduate schools.

The second stage ranged almost the entire 1990s. Doctoral education continued to grow during this period, based on the perceived need for highly trained professionals, especially by the central government. During 1992-1999, an annual increase rate of doctoral students averaged 20.6 per cent, surpassing that of Master's students (12.3 per cent) (Research Team on Analyses of Educational Statistics of China's Academic Degrees and Graduate Education, 2009, p. 38). The fifth, sixth and seventh batches of approved institutions and programmes were respectively 24 and 274, 5 and 145, and 49 and 341 (Guo, 2009). Another major change during this period was that those universities allowed earlier to experiment graduate schools were formally approved. They could select doctoral supervisors based on their assessment conducted within their own institutions.

The third stage was in line with China's most recent massive university enrolment. An average of 26.6 per cent annual increase rate was recorded during 1999-2003 (Research Team on Analyses of Educational Statistics of China's Academic Degrees and Graduate Education, 2009, p. 38). In 2000, another twenty-two universities were approved to set up graduate schools. During this period, doctoral enrolments increased from around 20,000 in 1999 to 49,000 in 2003, 53,000 in 2004 and 58,000 in 2007 (Department of Development and Planning, Ministry of Education, 1999, 2003, 2004, 2007). The supervisor-student ratio reached its peak, of 1:15.32 in the higher education institutions under direct jurisdiction of the Ministry of Education (Xie, 2006, p. 28).

There were three additions to the approved doctoral degree granting institutions and programmes respectively: 7 and 442 in 2000, 35 and 728 in 2003 (mainly in provincial higher education institutions), and 19 and 605 in 2006 (Wu, 2009). According to Chinese Ministry of Education's (2011, July 6) latest statistics, in 2010 China recruited 538,200 postgraduate students with 63,800 at doctoral level, total enrolment of postgraduate students reached 1,538,400 with 258,900 at doctoral level, and granted 388,600 postgraduate degrees including 49,000 doctorates. The number of doctorates conferred in 2010 was behind that of the United States of 57,599 in academic year 2008-2009 (Bell, 2010, p. 16).

In retrospect, the developmental path of China's doctoral education shows strong promotion and tight control by the central government, which decides which institutions are qualified to offer doctoral training and in what scale. However, the government after all is a political rather than academic organisation. Its actions in doctoral education are based on its ideo-political considerations (Wu, 2009). While it has guaranteed a fast growth of doctoral training, its tight control could stifle even denature the nation's doctoral education. For instance, in order to show its equal treatment to various ethnicities, the central government designated a few universities of nationalities doctoral degree granting capacity without seriously considering their academic achievements (H Q Wang, 2008). The high control has also caused strong, unhealthy competitions among local governments to win central government's favour to set up doctoral programmes within their jurisdictions, leading to insufficient attention to local needs.

## Distribution

In China, academic disciplines are generally divided into Arts and Sciences. The former includes literature, history, philosophy, economics, law, and management, while the latter covers natural sciences, engineering, medicine, and agriculture. Since China borrowed the former Soviet experience in the 1950s, there has always been an imbalance between Arts and Sciences. This is also the case in doctoral training, as shown in the distribution of doctorates. In 1996, the proportion of doctorates in Arts and Sciences were 15 per cent and 84.4 per cent respectively.

***Table 1: Doctorates Conferred Nationwide: 1996-2006***

| *Year* | *Philosophy* | *Economics* | *Law* | *Education* | *Literature* | *History* | *Science* | *Engineering* | *Agriculture* | *Medicine* | *Management* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 | 78 | 196 | 135 | 49 | 143 | 117 | 1441 | 2199 | 223 | 846 | 117 |
| 1997 | 95 | 260 | 201 | 751 | 197 | 146 | 1642 | 2636 | 286 | 1036 | 169 |
| 1998 | 112 | 388 | 241 | 117 | 248 | 190 | 2095 | 3276 | 373 | 1211 | 194 |
| 1999 | 148 | 513 | 290 | 145 | 349 | 198 | 2168 | 3769 | 383 | 1251 | 324 |
| 2000 | 199 | 514 | 330 | 144 | 387 | 257 | 2306 | 4484 | 462 | 1757 | 410 |
| 2001 | 218 | 621 | 444 | 199 | 491 | 269 | 3452 | 4746 | 551 | 2130 | 493 |
| 2002 | 263 | 855 | 615 | 213 | 648 | 310 | 2736 | 5020 | 651 | 2450 | 766 |
| 2003 | 323 | 1040 | 683 | 283 | 829 | 428 | 3496 | 6306 | 742 | 3085 | 1096 |
| 2004 | 370 | 1266 | 917 | 360 | 995 | 467 | 4293 | 7886 | 899 | 3714 | 1434 |
| 2005 | 439 | 1508 | 1122 | 437 | 1162 | 527 | 5269 | 9792 | 1102 | 4583 | 1843 |
| 2006 | 516 | 2030 | 1624 | 596 | 1590 | 562 | 6669 | 11643 | 1366 | 5792 | 2498 |

*Source: Li & Zhan, 2008a, p. 29.*

Such imbalance continued to be 26.5 per cent and 71.5 per cent in 2006. From the mid-1990s, the distribution of doctorates conferred in various disciplines has shown some interesting changes during 1996-2006, as shown below by Table 1: Engineering, Science and Medicine have remained unchanged as the top three; while Management jumped from the 8th in 1996 to the 4th in 2006; Agriculture was just the opposite, dropping from the 4th in 1996 to the 8th in 2006 (Li & Zhan, 2008a, p. 31).

The emphasis on scientific, technological and medical research is also shown by the annual national outstanding doctoral thesis awards. As shown by Table 2 below, while medicine, science and agriculture were all overrepresented, social sciences, without exception, were all underrepresented.

Another sort of distribution imbalance is institutional and regional: doctoral programmes concentrate overwhelmingly in key institutions in major industrialised areas. By 2007, for example, Peking and Tsinghua Universities had 201 and 181 doctoral programmes respectively. In contrast, by 2002, Guizhou had 2, while Qinghai, Ningxia and Tibet had none (Guo, 2009). Resulted from China's shortage of a broad-based distribution of research capacity, 55 per cent of the nation's doctoral programmes were in north and east China by June 2001. Major concentrations included Beijing, Shanghai, Jiangsu, Shaanxi and Sichuan (Lin, 2005), with an evident dominant role played by Beijing: in 2006, Beijing had 11,731 doctorates conferred, while Shanghai came as the second with 3,249, and all other provinces had fewer than 80 (Guo, 2009).

Institutionally, as elsewhere such as Australia (Pearson *et al*., 2008), China's doctoral programmes concentrate in the nation's major universities, which are designated by the government as 'key-point' higher education institutions. When the first batch of doctoral programmes were approved in 1987, 174 (91.5 per cent) of them were located in those key institutions (Wu, 2000, p. 45). Resulted from some long-term features of China's higher education growth, such major institutions have the nation's strongest academic staff, the majority of research funding, and the best equipments and facilities. This also means that these elite institutions have much better and larger student pool to select their doctoral candidates. As reported by a teacher training institution in the northwest, only 8 per cent of its doctoral students enrolled in 'key-point' institutions during their undergraduate and Master's studies (China's Doctoral Education Quality Research Team, 2010).

***Table 2: National Outstanding Doctoral Thesis Awards during 1999-2007 and Disciplinary Proportion of Doctorates Conferred in 2006 to the National Total***

| *Discipline* | *Annual Average of Awards (%)* | *Proportion of Doctorates to the National (%)* |
|---|---|---|
| Management | 1.7 | 7 |
| Economics | 2.1 | 5.7 |
| Law | 2.8 | 4.6 |
| Medicine | 10.4 | 16.3 |
| Science | 29.5 | 18.7 |
| Agriculture | 4.9 | 3.8 |
| History | 2.8 | 1.6 |

*Source: Li & Zhan, 2008a, p. 31.*

## Thesis

There have been various understandings of the quality of doctoral education and its assessment. Suggested indicators include the length between graduation and employment, nature and level of employment, starting salary, professional development and workplace performance. A national investigation on quality of doctoral training jointly commissioned by the Academic Degrees Committee of the State Council, Ministry of Education, and Personnel Ministry in September 2007 collected comprehensive data from virtually all institutions involved in doctoral training (including 257 higher education institutions, 31 research institutes and one Party school) and selected organisations that employ doctorate holders. In addition to the data collected through questionnaires and interviews, the study also compared domestic and overseas doctoral theses, analysed academic contributions by doctoral projects and workplace performance by doctoral degree holders. The study covered nine aspects including basic and professional knowledge, research capacity, morality, thesis quality, relevant subject knowledge, foreign languages proficiency, sense of (social) responsibility, creativity, and organisational skills. Respondents included doctoral students, their supervisors and administrators. It found that more than 80 per cent respondents reported positively in all those areas (China's Doctoral Education Quality Research Team, 2010).

However, the large-scale questionnaire survey and the assessment of doctoral theses relied heavily on respondents' personal judgments. It remains difficult to compare the quality of doctoral education in different institutions (Zhou, 2010). In comparison with some other criteria that often generate debates, the quality of doctoral theses has been recognised globally as a relatively much more reliable indicator (Ji *et al.*, 2009). The aforementioned project received highly positive comments about the overall development from supervisors and the administrators who were directly involved in doctoral training, especially in dimensions including foreign languages proficiency, quality of theses, and research capacity. In comparison with the situation thirty years ago, the study reported substantial improvement in the quality of doctoral work. The international comparison showed an overall shrinking gap between domestic and overseas doctoral theses, with some domestic work already at international cutting edge.

While recognising remarkable achievements within a relatively short period of time, the study acknowledged a considerable lag behind the practices in the higher education systems of major Western countries (China's Doctoral Education Quality Research Team, 2010). The width and depth of theoretical foundations and subject knowledge respectively scored poorly in social sciences, only slightly better in management, and apparently better in agriculture and medicine. When asked whether or not to meet international standards for argument and presentation, only sciences scored highly, while others all substantially lower than the perceived international practice, with social sciences at the bottom. Overall, the quality of China's doctoral theses in sciences was well recognised, engineering did reasonably well, while management was just passable and social sciences quite poorly (Guo, 2009, pp. 31-32).

Although such assessments were only based on the (indeed quite subjective) judgments of Chinese doctoral supervisors and administrators, and their comparability between Chinese and Western performances could be open to question, these findings can still shed light on the quality of Chinese doctoral theses. For example, problems in doctoral training in China's social sciences, such as political, sociological, law and educational studies, have been well documented within the Chinese academic circles and internationally (Chen, 2006). Over-general topics, shortage of empirical and/or first-hand data, loose argumentation, and highly subjective conclusions remain commonplace. Students in these disciplines usually lack a basic understanding of the latest international achievements in their subject areas, let alone engagement with them. They also often receive little methodological training (Yang & Zhang, 2008).

In universities of science and technology, a common arrangement in China is that doctoral students take on their supervisors' research, partially or in total, as their doctoral projects. A survey at the Beijing Forestry University reported that 14.6 per cent of students independently chaired their supervisors' research projects, 72.9 per cent participated and devoted most of their study time to the research projects originally granted to their supervisors, only 12.5 per cent of students, who were usually part-time students with full-time jobs, reported that their theses were rarely or never part of their supervisors' research work (Liu & Wang, 2011, p. 143). Similar to Beijing Forestry University's situation, such experience, for both supervisors and students, has been largely well perceived with each side gaining what they desired. This is the normal way for China's doctoral students to receive financial supports to conduct their projects. It also helps them to have actual research experience. However, based on a survey of three 985 universities,[2] 10.3 per cent of all the doctoral students never participated in any research projects, while in social sciences 24.6 per cent students

***Table 3: Disciplinary Distribution of National Outstanding Doctoral Theses, 1999-2009***

| *Discipline* | *Number of theses* | *Percentage of the national total* |
|---|---|---|
| Philosophy | 17 | 1.57 |
| Economics | 24 | 2.22 |
| Law | 29 | 2.68 |
| Education | 24 | 2.22 |
| Literature | 47 | 4.34 |
| History | 30 | 2.77 |
| Science | 316 | 29.21 |
| Engineering | 395 | 36.51 |
| Agriculture | 55 | 5.08 |
| Medicine | 113 | 10.44 |
| Military science | 12 | 1.11 |
| Management | 20 | 1.85 |

*Source: Zhou et al., 2011, p. 75.*

reported so. Nearly a quarter of doctoral students in the humanities and social sciences denied strong correlation between their studies and their supervisors' research projects (Luo *et al.*, 2009).

Each year around 100 outstanding doctoral theses are selected to be awarded as the nation's best theses of that year. During 1999-2009, a total of 1,082 from 145 institutions were awarded. As shown by Table 3, engineering, sciences and medicine have been the dominant disciplines. Table 4 further confirms the regional disparities in doctoral education in China: Beijing, Shanghai, Jiangsu, Shaanxi and Hubei were the top five positions, occupied 68 per cent of national best theses, while no awards went to Jiangxi, Guizhou, Xinjiang, Ningxia, and Tibet during the time period. As for institutional distributions, the top ten were Chinese Academy of Sciences, Tsinghua University, Peking University, Fudan University, Zhejiang University, University of Science and Technology of China, Nanjing University, Renmin University of China, Shanghai Jiaotong University, and Xi'an Jiaotong University respectively with 171, 85, 72, 48, 36, 30, 29, 25, 23, and 21 awards (Zhou *et al.*, 2011). Except for the national academy, all the higher education institutions are on the 985 Project list.

## Supervision

In China, doctoral supervision is on one hand highly debated, especially over issues such as the most important qualities for good supervision and whether or not there is a Chinese way to supervise doctoral students. On

***Table 4: Regional Distribution of National Outstanding Doctoral Theses, 1999-2009***

| *Province* | *Number of theses* | *Percentage of the national total* | *Ranking* |
|---|---|---|---|
| Beijing | 370 | 34.20 | 1 |
| Shanghai | 171 | 15.80 | 2 |
| Jiangsu | 89 | 8.23 | 3 |
| Shaanxi | 57 | 5.27 | 4 |
| Hubei | 49 | 4.53 | 5 |
| Zhejiang | 38 | 3.51 | 6 |
| Hunan | 37 | 3.42 | 7 |
| Guangdong | 35 | 3.23 | 8 |
| Tianjin | 32 | 2.96 | 9 |
| Anhui | 31 | 2.87 | 10 |
| Sichuan | 28 | 2.59 | 11 |
| Liaoning | 23 | 2.13 | 12 |
| Heilongjiang | 23 | 2.13 | 12 |
| Jilin | 22 | 2.03 | 14 |
| Shandong | 22 | 2.03 | 14 |
| Chongqing | 17 | 1.57 | 16 |
| Gansu | 11 | 1.02 | 17 |
| Fujian | 8 | 0.74 | 18 |
| Yunnan | 5 | 0.46 | 19 |
| Henan | 4 | 0.37 | 20 |
| Hebei | 3 | 0.28 | 21 |
| Shanxi | 3 | 0.28 | 21 |
| Inner Mongolia | 2 | 0.18 | 23 |
| Qinghai | 1 | 0.09 | 24 |

*Source: Zhou et al., 2011, p. 76.*

the other hand, it is also particularly valued. As reported by Liu and Wang (2011, p. 143), the doctoral students at Beijing Forestry University ranked supervision the second most important factor in deciding their completion of studies, only behind their own professional foundations and research capacity. Their majority (84.4 per cent) were happy with the supervision they had received, while 13.5 per cent thought it was 'just ok', and only 2.0 per cent considered the supervision was not acceptable. Similarly, 89.7 per cent of them reported that their supervisors attached much importance to their doctoral work, only one per cent were negative. As for how often they met their supervisors, 33 per cent answered 'monthly', 27.8 per cent 'fortnightly', and 25.8 per cent 'weekly', with 7.3

per cent reported 'twice a week' and 6.3 per cent said they rarely met. A survey of three major research universities by Luo *et al*. (2009) reported that 51.3 per cent of doctoral students met their supervisors at least fortnightly, while 18.6 had such meetings weekly. In terms of the frequency of supervision meetings between supervisors and students, there lacks clear disciplinary differentiation between social, natural and engineering sciences.

However, frequency alone does not tell the entire story. Some studies based on in-depth interviews found that it was still a common feeling among doctoral students that they did not have sufficient communication with their supervisors. The most cited complaints included over-generalised advices, group supervision without targeting at their specific problems, and too much formality (W H Wang, 2008). This echoes an earlier study at Tsinghua University, which found that 42.9 per cent doctoral students reported that their supervisors were not directing at their real issues, and 43.9 per cent complained about their supervisors' unavailability (Jiang *et al*., 2005). According to another even earlier study conducted at Shanghai which further confirmed such findings, 40.9 per cent doctoral students said their supervisors just 'let things drift' (Song & Zhang, 2001, p. 3).

However, unlike Australia where lack of emotional support and insufficient social interactions between supervisors and students are commonly cited areas of discontent by students (Leder, 1995; Shannon, 1995), national surveys find that while the assessment of doctoral supervisors[3] was much poorer, positive response still reached 50 per cent (China's Doctoral Education Quality Research Team, 2010). Yet, the situation could become worse in the years to come as China has more and younger doctoral supervisors, as indicated by Table 5. Younger supervisors have been widely reported to be more focused on their own research and publications rather than on their interactions with doctoral students. Indeed, both their commitment and academic quality have been seriously questioned (Xu, 2005).

***Table 5: Increase of Doctoral Supervisors***

| *Year* | *Number of Supervisors* | *Doctoral Degrees Conferred* | *Student-Supervisor Ratio* |
|---|---|---|---|
| 1996 | 3478 | 5578 | 1.6 |
| 1997 | 4149 | 6793 | 1.6 |
| 1998 | 5067 | 8518 | 1.7 |
| 1999 | 5895 | 9593 | 1.6 |
| 2000 | 6919 | 11378 | 1.6 |
| 2001 | 8049 | 13744 | 1.7 |
| 2002 | 8772 | 14706 | 1.7 |
| 2003 | 10507 | 18625 | 1.8 |
| 2004 | 12315 | 22936 | 1.9 |
| 2005 | 14874 | 28318 | 1.9 |
| 2006 | 17800 | 35628 | 2.0 |

*Source: Li & Zhan, 2008b, p. 14.*

## Career

Since the 1970s, there have been some studies on career development of doctoral degree holders. Earlier research in the United States focused much on academic publications and income (Clark & Centra, 1982). There have since been further studies in Europe (Mangematin *et al*., 2000) and Australia (Kubler & Western, 2007). In 2004, OECD initiated the Project on Careers of Doctorate Holders, which collected data from Australia, Canada, the United States, Switzerland, and Germany and used indicators including types of employment, career mobility, income, and career satisfaction (Auriol, 2007).

In China, national surveys repeatedly confirm a general satisfaction of doctorate holders with their employment after doctoral studies, although with the seemingly ever-growing number of doctorates, their advantaged position in the labour market will be challenged more in the years to come (Li *et al*., 2007). The majority of Chinese doctorate holders choose to work in higher education and research institutions, in scientific and research-related jobs, although as the Chinese society becomes more diversified, the proportion of those with doctorates working in research and teaching environment in China has declined, for example, from 77.7 per cent in 1996 to 46 per cent in 2006 (Li & Zhan, 2008b). Generally, there is a clear match between doctorate holders' occupational orientation and their actual choice-making behaviours (Zhao & Deng, 2011).

In 2007, a survey of 31,251 respondents from 289 doctoral training institutions, 200 government organisations and over 100 enterprises showed that on average doctorate holders were promoted to associate and full professor levels at the age of 34.1 and 39.7. It also found evident gender impact on promotion: generally female doctorate holders needed an extra of 7.2 months to become a full professor. The average ages for Chinese doctorate holders' first internationally indexed (Science Citation Index, Engineering Index, Social Science Citation Index, and Art & Humanities Citation Index) journal articles, first patents, and first research grants in a role of principal investigator were respectively 30.9, 33.2 and 33. Here, once again, it

took female doctorate holders an average of 2.4 months longer to reach the same level (Zhao *et al*., 2011).

Overall, the 2007 study showed clear advantages for doctorate holders to obtain professional promotions and gain academic publications. It was also clear that the younger when one received her/his doctorate, the more likely s/he obtained professional promotions. It is particularly interesting to note that the study revealed that while supervisors' academic reputation had clear impact on the age of their students' first academic publications, the impact on the ages of their students' to gain their promotions, patents and research grants was minimal. This is because promotion is mainly decided by length of service and research outputs. Only under special circumstances can one's academic achievements lead to her/his accelerated promotion.

As reported by Zhao and Deng (2011), another study in 2007 by the Chinese Academy for Science and Technology for Development revealed that the chosen occupational categories related closely to their doctoral fields of study: those from the humanities and social sciences tended to choose the teaching profession primarily (57 per cent); those from science often selected basic research fields (20 per cent); while those from engineering favoured applied research, and technology development (57 per cent). It also found a high correlation between doctorate holders' social backgrounds and their occupational choices.

## Conclusions

During the past four decades when doctoral education experienced a variety of difficulties in many industrialised societies, China established its national system of academic degrees and postgraduate education, and developed it fast to become one of the largest in the world. This has been in line with China's massive leap forward in higher education since the late 1990s and its ambitious bid for world-class universities within decades. Doctoral education has been strongly, and arguable strategically, promoted by the Chinese government. Today, China's domestically trained doctorate holders have become a significant force of the nation's research and innovation, contributing vigorously to economic construction and social development in the country.

As part of China's higher education, doctoral education shares features and characteristic of the wider national system. The above account has revealed tight control by the central government over doctoral education throughout the entire process of doctoral training. While the Chinese are catching up swiftly in doctoral training, they acknowledge the considerable gap between their achievements and those practiced in major Western nations. Indeed, despite of the relatively short history of development, China's doctoral education has had some tough problems to tackle. One serious issue is the aforementioned imbalances and disparities that could have far-reaching social and educational consequences, especially in terms of equity and justice. Another major issue is the rampant academic corruption that has deeply penetrated into China's doctoral training, seriously affecting its quality and international reputation (Shen, 2009).

Both the growth and many problems China has echo much the international scenario (Pearson *et al*., 2008). The Chinese experience is particularly eye-catching for its up-and-coming positioning in the global doctoral education landscape. In a society that becomes rapidly knowledge-based and internationalised, China's doctoral education needs to respond well to evolving disciplinary practices, industry interactions and the career goals of doctoral students. Although a borrowed concept, it has fostered some features of its own. It is interesting to see how further China's doctoral education fares in an unprecedentedly keen global competition. While whether or not China's doctoral education could live up to the nation's high expectations remains uncertain, doctoral education definitely has a critical role to play in the rising Chinese power.

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## Endnotes

1. China's earliest practices in postgraduate education started in 1918 at nine research institutions in arts, science and law programmes at Peking University. Before the official establishment of a national system of academic degrees and postgraduate education, China also provided postgraduate education in the 1950s and 1960s (Xu, 2005, pp. 47, 51).
2. Project 985 is under President Jiang Zemin's call at the 100th anniversary of Peking University on 4 May 1998, and code-named after the date Year 98 Month 5. It aims to promote the development of Chinese universities to raise their influence and reputation in the world. To achieve this goal, the Chinese central and local governments have allocated large amount of funding to universities admitted into this project to develop new research centres, improve facilities, hold international conferences, attract world-renowned academic staff and visiting scholars, and to help Chinese academics attend conferences abroad. When it was first announced in 1998, funding was made available to Peking and Tsinghua Universities only and then to an elite group of 9 universities. By the end of the first phase of the project, 34 universities were sponsored. The second phase of the project added 5 more universities, making the total number of universities sponsored by the project to 39. It was announced in September 2007 that the project would not admit other universities. All the listed institutions are recognised as China's most research-intensive universities.
3. In China, doctoral student supervisor is a prestigious title given by the central government to nationally leading scholars, based on their academic achievement (Gu, 1991).

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