

# Research on the Innovative Mode of Cultivating Professional Master Students in China

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**Abstract** This article attempts to provide an overall description of Professional Degree Masters, to examine and analyze the similarities and differences between Professional Degree Masters and standard Academic Masters, and to illustrate the valuable experiences accumulated during the development of professional degree education in representative countries through literature research method and comparative research method. It studies problems existing in China's present Postgraduate education system and probes that the mode of nurturing Professional Degree Masters could be improved by transmuting sponsoring concepts, electing outstanding graduates, optimizing teaching programs and establishing double or multiple supervisors system. This article concludes that the curriculum should be reasonable, practice oriented to promote the link between talent training and social needs and thus to result in an effective reform on Chinese professional master training mode in order to achieve practical outcomes.

**Key words** Professional degree master; Course master; Research master; Cultivating mode

## 1 Introduction

There are three main modes of postgraduate education in the world, 1) target on the region and flexibility--represented by America, "not only enrich students in the professional knowledge but also cultivate their creative thinking on university campuses."(He zhiyu, Feng Xuefei, Xue Liuzeng,Fu Wenbao,2004) "Elite education". In Germany," from the early 19th century it has paid much attention to the combination of the master's training objectives and the scientific research, and still retained the tradition and characteristics of the academic and research."(Graduate education groups of each European country,2002) Interdisciplinary integration goals. In Australia, it aims at "representing the development research students get more and new advanced professional knowledge of the project designs and evaluation". Chinese relevant researches basically have following three views (1) on the positioning of professional and academic, the representative viewpoint is "strengthen the cooperation and develop the exchanging researches of varies disciplines.(Zhang Jianrong,2008) The orientation theory of the subject construction. Representative viewpoint is "to strengthen cultured cooperation between the capabilities of the profession and academic."(Zhou Mingxing,2004) Focus on the professional and academically localization theory. Representative viewpoint is "without a start on training target, it should based on the specific circumstances of the process of cultivating students' innovative ability and covering the tutors guiding practice."(Luo Kuang,Rao Yilun,2008)

All opinions above reflect the different aspects of the cultivation target for master degrees. They also have roles to enlighten orientations of professional degree masters and to optimize the mode of cultivating professional degree masters in China.

## 2 The Description of Professional Degree Masters and the Aim of the Cultivation

The term Professional Degree Master is defined in comparison with standard Academic Master for whom the focus of degree studies are to a large extent course oriented. Professional Degree Masters are educated to become sophisticated specialists in their professional areas with the ability to apply good mastery of theories into field practices that suffice the requirements of particular industries and/or actual job contents. On the premise of solving realistic problems, Professional Degree Masters have a better understanding of the research areas and a stronger initiative to study. They tend to focus more on the practical use of theoretical knowledge and, given their existing professional skills, are more capable of bringing technical innovations and reinventions based on academic findings.

### 2.1 The characteristics of professional degree masters

Firstly, in perspective of knowledge structure, Professional Degree Masters command an in-depth comprehension of the professional theories and a broad scope of field knowledge, emphasizing on the completeness, coherence and practicability of knowledge system.

Secondly, on ability aspect, they advance in analysis and creativity on both theoretical and

technical fronts, due to their professional qualities and ability of action gained from the systematic training they receive.

An outstanding characteristic of professional master degree education is the combination of theoretical studies and a great amount of reality practice. Instead of proceeding to further academic and research careers, the Professional Master's Degree holders are supposed to work in their areas of expertise such as engineering, medical, educational, law and accounting. As a result, when presume/resume their careers, they will be expected to improve the standard of their industries and the efficiency of management through innovation in the respective areas, by their own knowledge and ability and thus, create value for the society.

### **2.2 The core competencies of professional degree masters**

The core competencies of Professional Degree Masters include resourcefulness, good professional qualities and relatively stronger practical abilities and creativity. During learning and research processes, they are provided with the opportunities to create and integrate professional resource. Based on their knowledge and skills, they will have the potential to fully use available resource and maximize the effectiveness, in order to obtain continuous competitive advantages.

Professional qualities, as a result of systematic professional trainings, refer to the basic work ethics include ethicalness, spiritual aspiration, strong sense of social responsibility, honesty, and good manners, which prepare the students to become qualified future professionals. (Zhang Xinyue, Dong Shihong, Zhou Jinqi, 2008). The practical abilities consist of the abilities to find and solve the problem, to make practice oriented knowledge transition and to coordinate and organize work and study.

In addition, Professional Degree Masters also exhibit strong creativity. Creativity not only reflects in both acquiring, re-structuring, and applying of the existing knowledge and researching and inventing of new ideas, technologies and products, but more importantly, also reflects as a conscious of presuming innovation and originality, as a tendency of facing and dealing with challenges, as a sensitivity in exploring opportunities and an adaptiveness to the environment. Creativity allows Professional Degree Masters to gain competitive advantages by means of new ideas, new technologies and new methods and therefore is the most important among the above mentioned core competencies.

### **2.3 The aim of professional degree master education**

The Professional Master Degree and the Academic Master Degree are equal degrees with different concentrations. They have their own definite positions in educational aims, and differ from each other in terms of teaching methods, teaching contents, and the standard requirements in achieving the degree. The Professional Master's Degree should be guided by practice in professional fields, with focus on activities and applications. However, the degree granting standard should still represent the distinctiveness of profession and the common requirements on professional knowledge and academic abilities for high-level talents. Hence, the writer believes that the educational target of Professional Masters is to produce top talents with practical capabilities to suit the need of the society.

## **3 Problems in Postgraduate Education**

By 2009, about 400,000 postgraduates had been enrolled in China. Looking from the employment tendency perspective, more and more postgraduates choose jobs of practical fields. With the development of the economy and society, the need of the application-based high-level professional talents is greater and more urgent in both quality and quantity. Now, the postgraduate education is facing these following four principal problems.

### **3.1 Unitarization of the training objectives**

At present, the amount of the academic master is too big, while the professional master cultivation scale is so small that only takes up 10 percentage of whole postgraduate education and the understanding to degrees of the society mainly concentrated on academic standards. The training requirement is the ability of scientific research and specialized technical work, and the training objectives are teaching and researching staff. But the development of the society needs not only scientists, college teachers but more application-based talents like high-level engineers and technicians, and high-ranged administrators.

### **3.2 Low adaptability of the talents training**

Today, the employment scope of the postgraduates is getting wider and wider, which does not only restrict to colleges and institutions. The result of this change is that the postgraduate training objects can't meet the need of society and go against with the practical work of graduates. The talents trained under the original objectives can not meet the demand of the society.

### **3.3 Scarcity of the types of professional degrees and coverless of professions**

From the analysis of the development of professional degree in China above, we can get that the types of our country's professional degree are enriched with more and more professions being covered. However, the quantity of professional degrees still constitutes a small percentage of graduate degrees, and the types of it are quit limited. As the social need of high-level application-based talents is various, the postgraduate training objectives should also be various. That requires to rapidly develop all types of professional degrees, and under the scope of one profession, it is still very necessary to settle flexible training objectives and plans to meet the society's need.

### **3.4 On-the-job postgraduates being more than full-time postgraduates**

The great percentage of on-the-job postgraduate affects the continuance of the development of student's study. Non-full-time education can't assure the quality of high-level talents training affecting the development of economy and society. Therefore, full-time professional cultivation is an inevitable result of the social development and an urgent need of the knowledge economy era.

## **4 Construction of the Professional Degree Training Pattern**

The aim of the training of the professional degree is to cultivate high-level application-based pioneering talents. So the concentration is put on the accumulation of students' practical experience and the combination of theory and practice. Further the reform of the training pattern of postgraduate training and strengthen the force of the training of the application-based talents can promote the connection between talent training and need of the society. Based on the completed description of professional degree talents and analysis of the experience and problems in the development of professional degree in and out of China, the essay puts forward constructive ideas about the professional degree talents training from the following point of view.

### **4.1 Changing the education belief**

Professional degree education is developed from experience and is adapt to the national conditions and practical training pattern of talents. It makes up the academic degree postgraduates' weakness in combination between theory and practice. But due to the low level of postgraduates is far from the satisfactory of the economic development. The postgraduate admission and training institution should seize the opportunity of enrolling the full-time professional degree postgraduates to reposition the training objectives and enlarge the scale of application-based talents. The development of professional degree should be paid great attention and the country should try to construct specialized professional degree brand.

### **4.2 Picking out outstanding source of students**

The quality of the source of students is the foundation and premise of full-time professional degree education compared to the enrollment of the on-the-job postgraduates, the enroll objectives of full-time professional degree is not restricted by the work experience. All the professional degrees examined and approved by Academic Degrees Committee of the State Council can enroll students, except for those that are prescribed or inappropriate for graduating students. The colleges examine the students who go for the reexamination according to the training objectives of the professional degree post graduator and increase the proportion of tests on practical ability, so as to picking out more potential source of students.

### **4.3 Reforming the training plans**

Professional degree training talents should have a solid theoretical foundation. On the other hand, they should possess the ability of practice. In order to assure the quality of the training of the full-time professional degree postgraduates, the colleges should make deep research and master exactly the laws of postgraduate education. The new training plans should be made with course study and professional practice.

The curriculum should be based on the fundamental knowledge of the students taking account of the system ethicalness of knowledge and the practical demand of the concerning field, making the improvement of comprehensive quality and implicational knowledge and ability as the core. The following curriculum analysis is based on the example of Electrical Engineering postgraduates; the training objective of professional master is training advanced applied technological, inter-disciplinary electric engineering technology and engineering management talent. The students should possess the basic theory In the field of Electric, widening and update original knowledge and master systematic related knowledge, should have capability to research and develop fresh technology, fresh product and fresh equipment, furthermore, they should have obvious ability to resolve practical mechanical

engineering technology problem and to carry through the pioneering work. According to the similarities and differences of training objectives between professional master and academic master, setting the curriculum table of comparisons, as shown in Table 1.

**Table 1 The Comparison of Course Master and Research Master in Electrical Engineering Field (the public courses are not listed)**

Category	curriculum	Class hours of master of course	Class hours of master of research	credits of master of course	credits of master of research	The minimal credits of master of course	The minimal credits of master of research
Basic specialized courses	Matrix analysis	46	46	3	3	9	9
	Statistics and stochastic process	46	46	3	3		
	Intelligent control	46	46	3	3		
Limited optional courses	Financial control	45	45	3	3	2	2
	Modern business management	45	45	3	3		
	CAT	32	32	2	2		
Major Elective Courses	New special electrical machinery	30	32	2	2	12	12
	Electrical machinery of	30	32	2	2		
	Advanced Power Electronics	30	32	2	2		
	System identification and parameter estimation	30	32	2	2		
	The analysis of modern electronic system	60	64	2	4		
	Operation and Control for Power System	30	32	2	2		
	HVDC and FACTS	30	32	2	2		
	New generating capacity	30	32	2	2		
	Modern Digital Signal Processing	30	32	2	2		
	Signal Detection and Estimation	30	32	2	2		
	DSP single chip microcomputer control	30	32	2	2		
Others	Academic activity			\	1	3	3
	Social practice			2	\		
	Published papers			\	1		
	Graduate thesis			1	1		

According to Table 1, comparing to the credits which is the minimal and to the calculated separately class that are needed by both the master of course and research, the ratio of professional course credits of two kinds of student is 1:1, Of course credits than limit for 1 class, the ratio of 1:1, Professional elective credits of the ratio of 1:1, the better than for hours. It indicates that two kinds of students in the class have professional elective course is calculated, further academic master knowledge

learned than professional master class hours at least 12 hours, more than academic master in professional knowledge learning cultivation.

Professional practice is an important link in the nurturing of full-time professional degree masters. In order to guarantee the quality, the practical teaching should be managed, served and assessed during the whole process. For example, thesis of the project master should be closely contacts with enterprise of engineering practice, the application of the theory knowledge learned to solve engineering problems in the theory or work, or the key technical problems. Comparing to the demands of student's social practice in table 1, it shows that professional master practice credits required for 2 points, and nothing for academic master, thus in the professional practice ability to master the cultivation. While opening the reasonable curriculum, it also needs the flexible teaching methods to link more closely between the courses and practices. Universities should exploit and build more external practice bases to provide students with more practice chances to improve their ability to solve practical problems. The specification and standard of professional degree essays should be properly set in accordance with the cultivation goal of professional degree. The titles of the essays should come from implicational tasks and realistic problems, which enables the essays to realize innovation of a certain degree and practically implicational value, based on profound academic foundation.

#### **4.4 Creating double-tutorial or multi-tutorial system**

The key to the cultivation of professional degree masters is a group of teachers with high theoretical knowledge and rich practical experience. Multi-tutorial system should be established and perfected both in and out of the universities. Intramural tutors play dominant roles, focusing on cultivating students' academic theory researching ability, while external tutors participate in practice, program research and course and paper instruction, cultivating students' practical ability, hence making the most of the multi-tutorial system. The nurturing of full-time professional degree masters requires more qualified tutors. Universities should select teachers with high professional knowledge as tutors and experts and scholars from other fields or with rich work experience as vice tutors. In this way, succeeding to professional knowledge, students can effectively combine theory with practice by putting theories into practice.

## **5 Conclusions**

In conclusion, the remarkable characteristic of Professional Degree education is the combination of theory studies and practice, with more attentions paid on the latter. In other words, it embodies a greater importance attached to the practicability of knowledge structure, as well as much focused applicability and creativity in the ability structure.

The author regards the Professional Postgraduate education as a scheme aiming to train application-oriented high-level specialized talents for the need of the society.

China's Professional Master Degree education could benefit from reforms in the aspects of transformation of the sponsoring concepts, selection of the capable pupils, optimization of the teaching programs, and establishment on a system of double or multiple supervisors.

A more reasonable program arrangement with better concentration on practical experience will in particular promote the connection between education and the ever growing social demand on talents, and consequently contribute to the success of reforming Professional Master Degree education.

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