

Research on the Training Mode of Professional Master with the Core of Practical Ability

A Case Study of the Control Engineering Field of Xijing University

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Abstract—The purpose of this paper is to explore the private university engineering master's service state special needs talent training project, how to improve the practical ability of engineering master to solve the practical problems of enterprises is a practical problem faced by the pilot colleges and universities. This paper discusses the application of the school practice base in the field of control engineering of Xijing University, the school enterprise joint training base, relying on scientific research cooperation platform and so on; it is feasible to take the practice ability as the core of Engineering Master's training mode in the field of control engineering of Xijing University. The innovation of this paper is to discuss how to improve the practice ability of the students in private colleges and universities from the private colleges and universities.

Keywords—practical ability; master of professional; school enterprise cooperation; training model

I. INTRODUCTION

Xijing University has become one of the country's five professional master's training pilot private schools. Graduate students in our country are that the creation of the world culture in private colleges, no successful experience is worth learning. Different from public colleges and universities in the system of civilian run colleges and universities, countries do not give financial support, relying entirely on their own to solve the problem of funds, there are a series of problems, such as teachers, and public institutions are different. Therefore, how to train the students in private colleges, how to get out of the characteristics of the private colleges and universities graduate training, this is a very real problem in front of the leadership of private colleges and universities. Therefore, the field of mechanical engineering from Xijing University, obtained the qualification of training graduate students began to control engineering, the board of the Xijing University and university leadership began training graduate top-level design. First by the chairman and the president directly responsible for, to set up a graduate student department under the leadership of the vice president, responsible for the training of graduate students. After the establishment of the leadership system, Xijing University began to develop training programs. Training objectives in the "special needs of talent service national training project" the spirit, spirit of service demand, project binding, double tutors, joint training guidelines, training application, composite high-level engineering and engineering management personnel.

The "national long-term education reform and development plan (2010-2020)" made it clear that the new mechanism to establish enterprise joint training talents, this is undoubtedly one of effective measures to develop the resource bottleneck breakthrough; the eighteen report also emphasized the collaborative innovation. Vice Minister of education Du Zhanyuan believes that we should vigorously promote the school, school, school enterprise, school and international cooperation between the depth of [1]. Zhang Daliang, director of the Ministry of education of the Ministry of education also pointed out that the collaborative education as an important mechanism, and gradually forms the education sector and industry departments to promote cooperation, universities and enterprises and institutions of the new situation of the depth of cooperation [2].

II. COLLEGE ENTERPRISE COOPERATION TRAINING PROGRAM BASED ON PRACTICAL ABILITY AS THE CORE

A. The opening of the curriculum pays attention to the theory and practice.

In the field of control engineering, the course is set up according to the practical application of the project. With professional demand as the goal, focus on theoretical knowledge and practice, in order to improve the comprehensive quality of students as the principle. Focus on practical application, emphasizing the teaching of professional practice and engineering practice courses.

B. Fully guarantee the quality of practice teaching

Practice teaching is an important part of the training of engineering master, and the combination of centralized practice and individual practice.. Master of professional degree graduate students in the study period, must ensure that not less than one year of engineering practice.

Second semester arrangement professional comprehensive experiment subject course, Combined with the requirements of the professional field of knowledge and the experimental facilities in schools, the creation of 3-6 modules of the comprehensive experimental project, focusing on the cultivation of students' comprehensive use of the professional knowledge of the ability. Students under the guidance of teachers, according to the research direction of the selection of 2 modules for research, students in the relevant laboratory to complete the requirements, and writing a comprehensive experimental study.

From the beginning of the third semester, according to the requirements of the binding project, the graduate student to the relevant enterprises to carry out research and practice activities, the content includes: familiar with the use of equipment and the production process of the enterprise, while the project related courses. At the end of the third semester to complete the selection of topics.

At the beginning of the fourth term to complete the thesis. At the same time, according to the specific requirements of the project, fourth, five semesters in the enterprise field or school laboratory for related research work. Graduate students in the engineering practice of the enterprise, to accept the guidance of the school mentor and corporate mentors, in the fourth semester of the school, to complete the paper interim report and accept the inspection.

Professional practice arrangement adopts the way of combining centralized practice and subsection practice; the total period of master's degree graduate students' practice (practice) is not less than one year. Under the guidance of the teachers and the enterprise tutor, the graduate student to formulate and submit the practice plan, fill in the professional practice (practice) record form, writing the professional practice (practice) summary report.

Professional practice including occupation morality, corporate culture and rules of education, to participate in academic activities, topics, comprehensive experimental research, practice, professional enterprise business and management courses and project practice is a compulsory part of graduate students, a total of 12 credits.

After the end of the graduate practice, to complete the 3000 words about the practice of reporting, enterprise Tutor (together with the school supervisor) based on the graduate student's practice summary report, comprehensive performance and feedback of the practice unit, etc., According to "excellent", "good", "pass" and "fail" four grades.

C. Emphasis on engineering practice of graduation thesis of master of Engineering

Master of Engineering in the field of control engineering graduate thesis topics should be derived from the actual production, or have a clear engineering background and application value. There is a certain technical difficulty, can reflect the comprehensive use of knowledge, there is enough work, graduate thesis of Engineering Master's degree should pay attention to the application of engineering practice. Graduation thesis is the embodiment of the author's ability of knowledge application and knowledge updating; the research results of graduation thesis can promote the technical progress of the industry, especially the industry development in the region. According to the above principles, the graduate thesis must be based on the practical problems that students encounter in practice, or from the scientific research project or technical innovation. Students complete the research work of graduation thesis in a year's time. Papers can be technical research, technological innovation, technology promotion and application; new products, research and development of new designs, new technologies, new materials and new applications; introduction, digestion and absorption of advanced foreign

technology and application projects; A more complete engineering technology or project management project planning or research and so on. After the research topic is determined, the form of graduation thesis can be applied research, engineering design, product development, experimental research report.

D. Master of professional degree graduate students to implement dual tutorial responsibility system

With the guidance of the teachers in the school, and with the enterprise tutors in charge of curriculum study, engineering practice, project research and paper writing and other aspects of the guidance. Enterprise teacher participate in student learning plan, formulate the enterprise practice program, students reported the topics of the opening stage of the review process, the pre defense, defense the whole culture. Develop business mentor selection principle; require enterprises to tutor the rights and obligations of enterprises to provide a reasonable remuneration tutor. Can also be based on the direction of the student's thesis, can also set up a steering group.

III. THE MAIN MEASURES TAKEN TO STRENGTHEN THE CONSTRUCTION OF PRACTICE BASE AND PRACTICE TEACHING WITH PRACTICAL ABILITY AS THE CORE

Attach importance to the construction of the graduate student practice base, including the experimental base and the enterprise practice base, has created the "professional direction laboratory, research and innovation laboratory, Engineering Research Institute, outside practice base, network information resources" and other resources platform, and in practice teaching has taken a series of measures:

A. In order to improve students' practical ability, strengthen the construction of laboratory

In order to improve the practical ability of engineering graduate students, the transformation and construction of the school invested tens of millions of dollars for 29 specialized laboratories, and specifically for the master of engineering new special power supply, data collection and analysis, GPS / INS applications, such as five laboratories, strengthen the experimental training base and innovation base construction, strengthen the construction of laboratory management and information technology. To establish an Engineering Research Institute as a research experimental platform of Engineering Master's degree in Xijing University.

B. The establishment of graduate innovation practice platform through school enterprise cooperation

Through the joint efforts of school enterprise to build off campus practice innovation platform; as a graduate student of practice, practice base, sharing equipment resources and information resources, to expand the ability of students to build a strong extension of the support platform; promotes the engineering master's graduate student's practical ability promotion; teachers through business practice to guide students to practice, to understand the needs of enterprises, to find a breakthrough in scientific research and innovation, students in the cultivation of innovative consciousness in the practice of practice, looking for innovative projects, as

competition, graduate design, Graduate Innovation Fund, graduate thesis topics.

C. Construction of a number of thematic integrated experimental module to improve the practical ability of Engineering Master

Special subject of comprehensive experiment: a special comprehensive experiment of 7 modules is set up, such as "distributed control system (DCS) experiment", "level PLC\ inverter, touch screen control system based on", "switching power supply comprehensive experiment", these special comprehensive control engineering, testing technology, sensor engineering, electromechanical transmission control and other related courses, graduate students master knowledge and applied practice ability training.

D. Encourage engineering master students to actively participate in various competitions to improve practical innovation ability

In order to improve the practical ability of engineering graduate students, the school practice teaching base is established. Encourage engineering master students to actively participate in various competitions to improve practical innovation ability. Course experiment, comprehensive experimental, design of enterprise practice. Establish a three-dimensional practice teaching system, practice teaching in the graduate teaching plan, accounting for the total credits of 35%.

After the practice exercise strict school process, into the enterprise practice for students to lay a solid foundation, so that students practice process allows enterprises to benefit out of the enterprise, afraid of students to participate in practice of the haze, enterprises are also willing to arrange for students to practice, so as to greatly improve the students' practical ability.

IV. CONCLUSION

Through these years of practice, Xijing University has explored a set of their characteristics of the road of graduate cultivation. For private colleges and universities engaged in graduate training work has accumulated experience, can provide reference for the private college graduate training. Facts have proved that, under the premise of fully guarantee the enterprise benefit, with practical ability as the core of the professional master Enterprise Co-training mode is still a big future.

Practice has proved that the model in full cooperation interaction based on the joint education of school and enterprise, to the enterprise as a platform to project the graduate students can improve the ability to solve practical problems, this is an effective way, the following results have been achieved.

A. Realize the School, Enterprise and Graduate of the Three Party Win.

To solve the problem of lack of resources of school culture, broaden the educational and social services space; enterprises with talent resources to solve the problem of the actual production, at the same time for their own development reserves of human resources, saving the cost of recruiting and

training personnel; graduate students to obtain the ability of society, laid the foundation for a solid to society[3] .

B. With Practical Ability as the Core of the Professional Master Enterprise Co-Training Mode Effect Is Remarkable

Improve the students' practical ability, and solve some of the relevant technical problems of enterprises. In order to control engineering of Xijing University, 2012, 30 students of grade 2013 and two grade total graduate, the first author published 67 papers in journals and conferences, including SCI and EI retrieved a total of 52 papers, 4 papers in core journals, all kinds of winning the competition 23 times, made the invention or utility model patents 45, and help enterprises to apply to the practice of 2 research projects. The school has set up a "four" training objectives, namely to complete a graduation thesis, published a Zhenti really do business (or vertical) project, made a related occupation qualification certificate, to declare a patent. The students who have been trained in this way can improve the writing ability of the thesis, also raise the ability of patent consciousness and patent writing, and also improve the ability of graduate students to solve practical engineering problems. Through school enterprise joint training, the graduates of the personal business quality and comprehensive quality has been greatly improved, and the recognition of the recruitment unit, Xijing University, master of control engineering in the field of professional master's employment rate of 100%[4].

Xijing University control engineering services in the field of special needs of graduate students training program has graduated from the master's degree 2012, 2013[5]. We have studied the two graduate students who have graduated in 30 years, the data obtained by the analysis are as follows: job analysis is shown in Fig. 1[6], employment unit analysis is shown in Fig. 2, ability to solve the problem as shown in Fig. 3, found that the problem is shown in Fig. 4, the ability to cooperate as shown in Fig. 5, the analysis of wages and salaries as shown in Fig. 6.

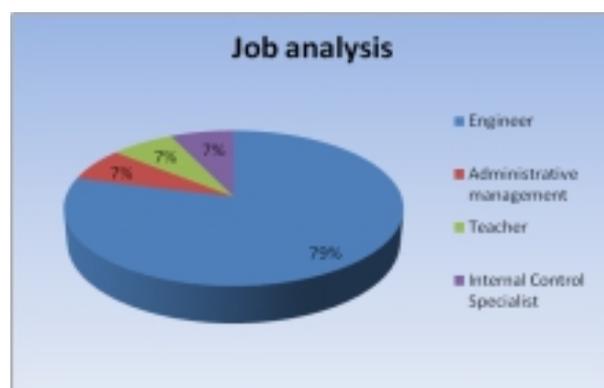


Fig. 1. Job analysis

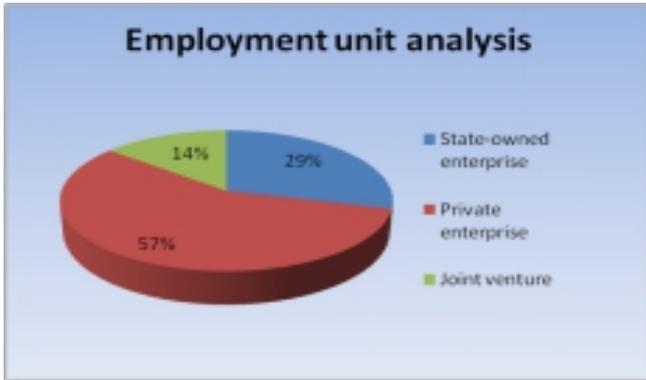


Fig. 2. Employment unit analysis



Fig. 5. Cooperation ability



Fig. 3. Problem solving ability

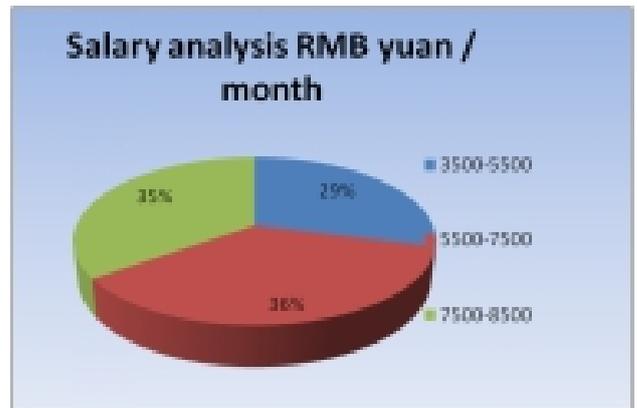


Fig. 6. Salary analysis

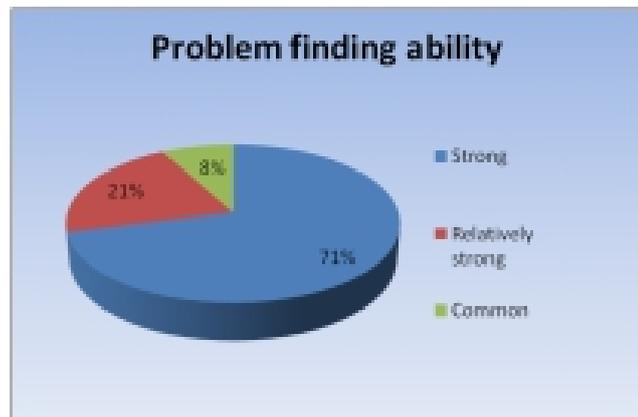


Fig. 4. Problem finding ability

The master of the school enterprise cooperation practice ability as the core of the training mode has important application value, for the master of engineering training can be of the same type of private universities in the field of engineering has played an exemplary role, also can provide a reference for other areas.

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