

# Cultivating Base Establishment of Postgraduates with Professional Degree on the Idea of Large-scale Engineering

Aijun Tang<sup>1</sup> Hailong Ma<sup>2</sup> Bin Xu<sup>2</sup> Xingdong Yuan<sup>2</sup>

<sup>1</sup>School of Mechanical and Electronic Engineering in Shangdong Jianzhu University, Jinan, Shandong Province, China

<sup>2</sup>College of Materials Science and Engineering in Shangdong Jianzhu University, Jinan, Shandong Province, China

## Abstract

Aim at the insufficient education resource, especially the software and hardware conditions lack, the postgraduates with professional degree are difficult to become the application talents for society after graduation. Based on idea of large-scale engineering, this paper discusses the postgraduate training base in major of Materials Science and Engineering in Shangdong Jianzhu University, which is an advantage complementary between social forces and enterprise. This paper deepens the reform of professional degree graduate training mode, and improves the quality of postgraduates with professional degree.

**Keywords:** Postgraduate training base; Postgraduates with professional degree; Idea of large-scale engineering.

## 1. Introduction

The purpose of setting the professional degree is to "speed up the training of high-level professional talent for economic construction and social development". The current Master education in our country is on the scale of development, that training mode is gradually transform into the professional type from the single academic type, and

the proportion of postgraduates with professional degree is more and more big.

Constructing the postgraduates base of university-enterprise cooperating is the most appropriate point and approach between the university and enterprise. The research, new technology and new product development in the university and enterprise cannot leave the training base. The training of postgraduates with professional degree isn't more leave the training base. Establishment of training base is in varied forms, which depends on the university's contribution to enterprise. Large contribution can obtain the big gain, and vice versa. The training base is beneficial to the postgraduates, which must be persist and studious by the university. On the idea of large-scale engineering, Shangdong Jianzhu University explores to establish postgraduate training base for professional degree with the enterprise, which improved the quality of postgraduate.

## 2. Main connotation of large-scale engineering

Large-scale engineering is a teaching system based on the large-scale, which is a comprehensive systematical social engineering. This engineering need learn the basic theoretical knowledge and

technological innovation knowledge, and adjust continually the educational goal, content, measure and method according to the technology and market[1].

In order to adapt the development of modern social integration, the idea of large-scale engineering integrates the learning knowledge with training capacity, integrates the service development with comprehensive quality, integrates the scientific spirit with humane cultivation, integrates the reality adaptability with active innovation in the cycle of practice-knowledge-practice, which achieve the overall development engineering talents [2,3].According to the practical nature of large-scale engineering, the talents in major of Materials Science and Engineering can improve the innovative ability of engineering practice by practical education[4].

### **3. Postgraduates base establishment of university-enterprise cooperating**

#### **3.1. The significance of university-enterprise cooperating**

It has been an important subject how the intelligence of university advantages combines with the enterprise funds, production, and market advantages to form the virtuous cycle of “postgraduate wants to learning, enterprises want to accept”. The new product development and performance testing of the enterprise cannot leave the training base. The new technical experiment and maintenance can't leave the training base, too. In the college engineering professionals, teachers' scientific research cannot leave the training base. The subject research of postgraduate isn't more leave the training base. Therefore, the technical cooperation based on the training base is the most main, concrete and effective embodiment of university-enterprise cooperating.

#### **3.2. The form of university-enterprise cooperating**

In order to do well the training base, the advanced equipments of university and research direction and level of research team are the foundation, and the enterprise potential effectiveness is the key. According to the specific circumstances, establishment of training base is in varied forms. The training base can be built in the university or enterprise. The university and enterprise can add the new investment to build the base, and can share the original equipment to build, and can also in between. Based on the experiment equipment, site and intelligence superiority, the university can provide experimental instrument or site, which can only include the postgraduate, scientific research personnel in the training base construction to give guidance. Based on the capital, production equipment and practical subject, the enterprise can provide the capital (including equipment purchase and subject funds), equipment building together. It can form the various combination of university-enterprise cooperating.

#### **3.3. The postgraduate activities form in training base**

The aim of related enterprises participating in the training base is to solve some technical problems, new technology or the new product development, equipment modification or development etc., which are concerning the product testing, production process for the maintenance, and upgrading the product. The enterprise of base can provide research subjects in successive years, which can also provide irregular subjects, which can also find the subject by the university. The postgraduate can be mainly in the enterprise to do subject, who can also be mainly in school and

sometimes in the enterprise to do the experiment. According to the requirement and the distance between enterprises and university, the postgraduate decided to live in university or enterprise. The cost and living subsidy for postgraduate can be contributed by the enterprise or both. When the training base is located in enterprise or the main research activities in the enterprise, the postgraduate need employs a vice tutor in the enterprise, and implement “two tutors model”. Of course, the cooperation cultivation is not limited in “two tutors model”. The providing experimental condition, subject, research funds in enterprise can be classified as “cooperating training”.

#### 4. The teaching reform and the effects on the idea of large-scale engineering

##### 4.1. Integrating the practical teaching resources.

Through the two successive central and local laboratory projects and provincial experimental teaching center in College of Materials Science and Engineering, we will perfect and optimization practice teaching link, and choose 10-15 corresponding enterprises to establish the stable practice base. We will develop the practice teaching combined with the enterprise product development, technology innovation, process modification. In order to improve the postgraduates' practice ability and innovation ability, according to the platform of training the practical ability, experimental teaching resources is integrated. The experimental teaching process is complete experimental teaching process of material composition design—material reparation and process—material property detection and analysis—material application. In the process of experimental teaching, we establish the engineering training

platform, professional experimental platform, comprehensive experimental platform, innovative experimental platform. Every platform can be divided into some experimental modules according to the demand of ability training and knowledge structure system. Every module have some experimental projects which gradually undated. The characteristic is start from the training objective, which give priority to the ability training. The experimental teaching connects closely with the engineering application. The system of level-division, multi-module, platform-based and layer-by-layer progressive trains the practical ability and shows the undergraduates' individuality. The construction and reform content of practical education is followed as Fig.1.

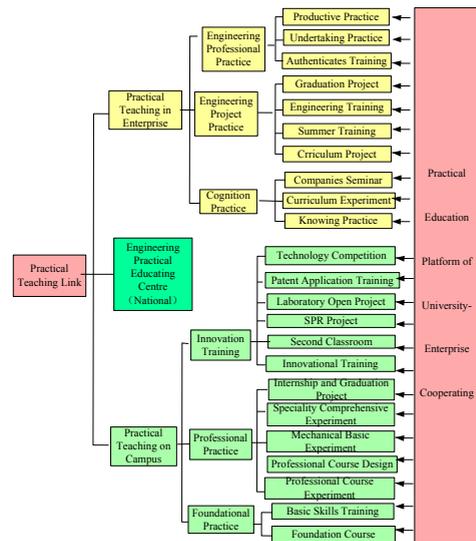


Fig. 1: Construction and reform content of practical education.

##### 4.2. Promote the integration of practice teaching, scientific research, engineering and social application.

At present, our college has signed the agreement about education base with some enterprises, such as Linuo

Paradigma Solar Energy Company, China National Heavy Duty Truck Group Corporation, Shandong Wu Zheng Group and Shandong Ju Ling Group. Materials functional laboratory which is cooperating built by our school and Jin Jing Group encourages postgraduate to participate in scientific research project. The latest research achievements will be integrated into practical teaching in time, which makes the postgraduate understand the academic front development conditions, and strengthens the innovation consciousness. Moreover, materials functional laboratory also updated the practical teaching content, and improved the practical teaching reform, and promoted the training base construction. The organic combination between the university and enterprise can give full play to the enterprise's effective resources. The "building function glass" laboratory which is cooperating built by our school and Jin Jing Group explores to transmit the production process data of large-scale production line for low radiation coated glass to the classroom teaching. In the process of solving the difficult technical subject, we introduced the technical ideas into the practical teaching, and designed some innovative experiments. For example, the subject achievements of "technology and application research of Solid Boron - Chrome Co-soaking" is applied by Shandong Ju Ling Group to the drill bushing, which increased the wear, prolonged the service life, improved the production efficiency, and saved the capital more than \$ 1 million.

## 5. Conclusion

In short, with the rapid development of the high-tech, we should focus on service in the local economy, promote social development and enhance the ability of independent innovation. On the idea of

large-scale engineering, we centre the "innovation consciousness, creative ability, entrepreneurial spirit and ability" to training the postgraduate. We explore the breakthrough point, form and running mode of cooperating training base to set up the long-effect mechanism of training mode, and improve the innovation ability and the training quality. Thereby, it can meet the need of social high-level professional talents, and lay the solid intelligence foundation for the country's economic construction.

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## 7. References

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