

Professional Practical Teaching Model Reform Research of Mechanical Specialty

Liai. Pan¹

¹College of Mechanical and Vehicle Engineering Changchun University, No. 6543, Weixing Road, Changchun and 130022, China

Qiulei Du¹, Chunshan He^{1*}

¹College of Mechanical and Vehicle Engineering Changchun University, No. 6543, Weixing Road, Changchun and 130022, China

Abstract—On the basis of professional analysis of the mechanical engineering college, the importance of profession education has been put forward in traditional practice teaching; though research of profession education status at home and abroad, how to introduce profession education has been put forward in mechanical specialty, professional education how to integration with the traditional practice teaching, and the corresponding reform measures have been put forward. The application of these measures was conducive for students to understand theoretical knowledge and enhancement of practical ability and employment ability.

Index Terms—Practical teaching, Profession education, Model Reform, Mechanical specialty

I. INTRODUCTION

The task of applied undergraduate education is to cultivate the senior applied talents facing production, engineering, management and service. Practice teaching is an important means to achieve this task. To build a set of practical teaching system adapting of applied undergraduate talents training mode and achieve the purpose of theory teaching, it is the key to achieve its goals and tasks of applied undergraduate professional education. Therefore, in this paper, starting from the actual situation of our college, career planning of our college graduates has been analyzed, the importance of profession education has been put forward, profession education and practical teaching system can be integrated in a series of beneficial exploration and practice, and it could provide the cultivation of applied talents with good conditions.

II. SPECIALTY STUDENTS' PROFESSIONAL ANALYSIS

Along with large industrial recovery in recent years, in our country, the demand of the talent who are proficient in modern mechanical design and management is gradually increasing. The demand of mechanical talents will be larger; especially the numerical control developed talented person has become the target of each enterprise

competition. As in recent years, the employment rate of college of mechanical and vehicle engineering of our university has remained at more than 90%, structure and geography of students once employment are very good.

Mechanical specialty of our college mainly includes mechanical engineering, industrial design, industrial engineering and vehicle engineering; And other colleges and universities mainly includes mechanical design, mechanical engineering material forming and control engineering, process equipment and control engineering, etc. There was a misunderstanding for many people to employment prospect of mechanical specialty; they think of this kind of counterparts' work of mechanical specialty not to look "decent". Actually, they have ignored the breadth, adaptability of mechanical specialty, such as equipment maintenance, CNC maintenance, environmental protection equipment design, and application of other fields. At the same time, the mechanical specialty also involves a lot of cross section, through the accumulation of knowledge, they provides a strong protection also for across mechanical professional, cross-industry employment. Mechanical specialty requires students not only have keen sensibility and the unique creativity, but also has the rich imagination and strong hands-on ability. Now professional analysis of the individual students of our school is as follows:

A. Mechanical Engineering

The purpose of mechanical engineering is to cultivate the modern mechanical engineer. It is also open to one of the oldest specialty in colleges and universities. Over the years, it is the secret of longevity: no matter how much a society civilization development to, it cannot leave the machinery manufacturing; it is the basic safeguard of people material life supplies. The graduates are mainly to the first line of industrial production, and engaged in the design and manufacture in the field of machinery manufacturing, mechanical and electrical product development, mechanical product development, development of hydraulic products, instrumentation development, weapons development, automobile industry, environmental protection equipment, mining equipment design, mound design and manufacturing, machinery manufacturing craft, CNC engineer, science and

Corresponding author: he03cs@126.com

technology development, applied research, operation management and business sales, etc. Employment distributions are at most five provinces and cities: Beijing, Shanghai, Zhejiang, Liaoning, and Shandong.

B. Industrial Design

Industrial design is the art and related mechanical engineering. Industrial design is belong to the modern industrial product, product structure, industrial structure of professional planning and design, innovation of machinery. It is the core of the environmentally friendly process from scientific and technological achievements into products, forming products, in line with the requirements, it is the landing site of technological innovation and knowledge innovation, and it is transformation method from the product, goods, and supplies to waste system.

This specialty is to train applied senior specialized talents with the basic theory of industrial design, knowledge and application ability, who can be engaged in enterprises and institutions, mechanical professional design departments, scientific research units engaged in industrial product modeling design, visual communication design and teaching and scientific research work. The value of industrial design in a product, which accounted for is not easy to quantify, because it lies in the inside, is a soft value. In some foreign, there is similar analogy, such as in the United States there is a saying: if in enterprise investment in technology and equipment update brought benefits, the benefits of the industrial design is five times. That said that the important status of industrial designers is self-evident.

C. Industrial Engineering

This specialty is to train applied senior specialized talents with mechanical engineering, management, engineering related professional knowledge and ability, who has the mechanical product design and manufacturing and production management ability,. Industrial engineering graduates have the basis of both engineering and management, a wide range of interpersonal and organizational skills, favored by foreign companies, joint ventures and domestic large and medium-sized enterprises. The employment face is very wide, graduates can be engaged in the manufacturing and service companies as the industrial engineering and manufacturing, engineers and managers in the field of quality, logistics, etc., can also become managers in government or consulting firm, civil servants, or engaged in teaching work in the field of education.

D. Vehicle Engineering

This specialty is to train the senior engineering and technical talent with the vehicle structure design, vehicle manufacturing and test engineering, system engineering, vehicle performance vehicle environmental protection and energy saving project, vehicle operation management and marketing and other professional knowledge, who has on the basis of the research and development of the vehicle, as well as computer control ability, can be engaged in vehicle design, vehicle manufacture, test and research, technology development, quality control, production

organization and management, vehicle sales, teaching and scientific research in vehicle engineering and related fields. Vehicle engineering is a new major; the employment situation of graduates is not statistical.

III. NECESSITY OF PROFESSIONAL EDUCATION IN MECHANICAL SPECIALTY

In recent years, the employment of college graduates has become a more important social problem. Every year a large number of college graduates are into society and to participate in the competition, but the employment of college graduates is not ideal. A position in the workplace often has dozens of people, hundreds, even thousands of people. For many graduates, regardless of find a good job, even if to find a job is more difficult. With today rhythm faster and faster, time of our lives has been greatly different from our parents, you need to quickly and efficiently to make beautiful achievement, otherwise you will easily knocked out. This is the life that we have to face. Many enterprises can't find satisfactory candidate, it is due to cannot find a good professional quality of graduates. So, the enterprise has professional quality as an important index to evaluate people.

A. Connotation of Profession Education

So far, definition of the widely accepted professionalism: professionalism is to have a mature professional concept and attitude, to master and apply skilled efficient professional methods and skills, and professional tools and resources, to have good professional image and etiquette, in order to enhance the execution ability, improve work efficiency, which includes professionalism literacy, professionalism conduct and professionalism skills.

B. Research Status of Profession Education

Overseas Research Status: In order to meet the requirement of economic and social development and the change of the labor market, in western developed countries, important measures of professionalism education were taken early; open lifelong professional education system was established. Proposed slogan "the lifelong learning and training, the bridge to the future", lifelong education is not only required to build a new system of professionalism education, it was the more important to conduct the reform of the higher education teaching. French higher education professionalism tendency: firstly, short-term technical university (IUT) and a surge in the number of enrolled. Only two years, the graduates have been recruited from high school examination, and were mainly cultivated professional technical backbone; secondly, starting in 1991, the emergence of the university vocational college (IUD). The three years of college education, students have been recruited for a year of higher education, professional curriculum content has obvious professional. Thirdly, the higher education law was promulgated in 1984, from the Angle of law, it promoted the professionalization of higher education. Fourthly, on the teaching content and system reform, they tend to professionalism education.

Professionalization trend of German higher education: firstly, the "dual system" Professionalism education mode of the original secondary education, Professionalism education was introduced into the field of higher Professionalism education; Secondly, in 1976, Germany in the general method of higher Institutions, the task of colleges and universities was confirmed as: "for the students to engage in scientific knowledge and methods be applied or art manufacturing capacity to prepare occupational activities"; Thirdly, strengthen the reform of higher classes and pay attention to the development of college students' practice. Professionalism tendency of UK higher education: firstly, more efforts to establish multidisciplinary professional and technical college; Secondly, through the form of legislation of the national education, the university personnel training and the demand for talent social business closely are combined; thirdly, university contracts with industry and commerce enterprise industrial employment. At the same time, entrepreneurs also are invited to open business talents lectures in university, and open teaching company, business clubs, and Science Park. In the United States, cultivation of talents is attached great importance in Higher education. Firstly, through legislation by congress, college graduating students' employment problem was paid the attention in the college. Secondly, through the hierarchy of higher learning institutions, set the professional education in the college teaching type series, in order to cultivate professional and hands-on type talents. [1,2]

Domestic Research Status: College students' employment situation is very serious in our country. In 2003, about 640000 college graduates could not find work. Therefore, in 2005 the state council on vigorously develop vocational education decision "put forward that by the year 2010, in the key secondary professional schools at or above the provincial level and conditional professional colleges, a professional skill appraisal should be set up, and carry out professional skill appraisal work. After assessment is eligible, the students can obtain certificate of academic degree and corresponding professional qualification certificate. At present, Zhang Ying etc. [3] have studied an important position of the practice teaching in applied undergraduate professionalism education. Yan Shiwei [4] has researched that professionalism education of environment art design major should be highlighted "skill pay equal attention to" dual-track system. He Chunyan etc. [5] have researched the higher professional teaching reform as the center of "professionalism". Shi Yongjin etc. [6] have studied the professionalism education of common colleges and universities, and put forward some measures for your reference. Professionalism education is not to train professional talents in narrow sense, but for our students to adapt to career and the service after the work. This is the same view with "wide diameter, thick foundation, heavy capacity, and innovation". It not only makes students in ordinary higher education, at the same time, also received professionalism accomplishment, professionalism norms, and professionalism skills.

C. How to Introduce Profession Education in Mechanical Specialty

Profession education is introduced in mechanical engineering in colleges and universities; the students' profession development is mainly emphasized. The instructors should have profession knowledge as the main content, apply the certain means, carry out a variety of activities, and create professional situation cognition, emotion and behavior which are suitable for students, guides them to form stable professional sentiment, professional attitude, eventually forming process of health professional personality. [7, 8]

Well trained, code of conduct. Students not only learn a wide range of professional knowledge, and fully feel the air time and influence of campus culture. They also accept the targeted practice training, in order to lay the groundwork for professional development.

Integrated into the society, looking forward to work. Attitude participated in fact is a kind of professional consciousness. Use active integrate social practice, target to guide behavior, strengthening professional sensitive, intuition and professional thinking.

Focus on professional and industry. This is the essence of professionalization. More requirements of my future career embodied fully to grasp in trend of policy and industry development, and presented with joy and concern of the industry.

Identify individual development to meet the needs of society. Clear personal development cannot leave the development of the whole society; try to adjust their state of mind, habit and action.

Do right things to adapt to the environment. This is a requirement of the future professional norms, associated more closely with students' professional development.

Profession skill standardization. Professional skill is the basic requirement of profession. In accordance with the different stages of professional ability request, students should follow the necessary prerequisite and the principle of autonomy, choose skill certification program of this specialty. Seeking "one particularly many ability" talent requirement.

IV. RESEARCH OF PROFESSIONALISM EDUCATION IN THE PRACTICE TEACHING SYSTEM

Objective of personnel cultivation of Mechanical specialty in colleges is to technical personnel of process and design. So, we should have the technology application ability as the core, strengthen practice teaching, and it is particularly important to integrate the professionalism education. Now mainly the several aspects what reform the practice teaching are following.

A. Practice Stage of Basic Skills

Arrange cognition practice, cartographic generalization of surveying and mapping and metalworking practice. The cognition practice is to take a freshman to the enterprises to visit, and to make the students preliminary understanding in industrial equipment and parts frequently used, for the mechanical drawing of learning and

generalization of surveying and mapping. This stage makes the students preliminary understanding this major, and master the basic skills of this professional work.

B. Practice stage of Professional Skills

Correspond to specialized course; arrange course experiment, course curriculum design, numerical control practice, production practice and so on. By the experiments and curriculum design in universities, make the students to consolidate the theoretical basis, master the design idea, improve the ability of calculation, and then to enterprises into the "real thing" internship, a gradual process, can make the students master the professional skills and apply it to the production practice.

C. Practice Stage of Comprehensive Skills

At this stage, first of all, the comprehensive experiment has been arranged. Including electrical control comprehensive experiments, comprehensive experiments and engineering machinery comprehensive class how to make the professionalism education and practical teaching system of mechanical engineering mix together, and become an indispensable part. Curriculum design is to train students' ability of solving practical problems. Secondly, the practical and comprehensive graduation thesis (design) is irreplaceable by other teaching link. In this part, cultivate the student's abilities such as arrange work plan, access to information, design calculation, analyze and solve problems, drawing, verbal statement, and style of work and so on. Thirdly, organize students to take an active part in the discipline and skills competition, make students of the solid theory foundation and spare capacity in this discipline competition platform, improve and play innovation spirit and practice ability.

V. CONCLUSIONS

In the paper, through professional analysis of the mechanical engineering students, the importance of profession education has been put forward in traditional practice teaching; On the basis of research status at home and abroad of profession education, how to introduce profession education has been put forward in mechanical specialty, professional education how to integration with the traditional practice teaching, and the corresponding reform measures have been put forward. The application of these measures was conducive for students to understand theoretical knowledge and enhancement of practical ability and employment ability. The measures

have been implemented and the evident results have been achieved. However, with times development and social progress, no grades may once and for all. Practice teaching system of mechanical specialty still need to continuously explore and updates, advancing with The Times, constantly improve the quality of personnel training, and deliver more pillars to create an innovative country.

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