

Practice Teaching Reform of Mechanical Design and Manufacture and Its Automation Specialty under Transformation and Development

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Abstract: With the development of the times, undergraduate colleges and universities begin to transform and develop to adapt to the changing society, and put forward new requirements for practical teaching strategies, especially for applied undergraduate colleges. The reform of practical teaching is particularly important. Under the development of education transformation, the reform of mechanical design and manufacture and the practice teaching of automation specialty also occupy a very important position. Through the understanding of the reform of the practical teaching of this specialty, the effect of the reform is observed, and a reasonable teaching scheme is put forward to promote the steps of the transformation of the practical teaching.

Keywords: Mechanical design; Mechanical manufacturing; Mechanical automation specialty; Practical teaching of transformation and development

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1. Introduction

At present, there is a certain disconnection between the talent training strategy of our country's educational cause and the development of our country's society, and the transformation of practical teaching is the inevitable trend of the development of our country's undergraduate colleges and universities. Our Ministry of Education put forward in "the guidance opinion on the pilot Project of Transformation and Development of Local undergraduate Colleges and Universities". The key to the transformation of education reform is to transfer the idea of running a school to the development of the local society and economy, to carry out the cooperation mode of the combination of industry and education, to train the applied talents and to strengthen the students' ability of employment and entrepreneurship. From the transfer of these two keywords can see the importance of practical education in China, the country and society attach great importance to the professional construction of applied colleges and universities, in the development of talents to promote the development strategy.

2. Requirements for Practical Teaching of Mechanical Design and Manufacture and Automation Specialty under the Background of Transformation and Development

The practical teaching of mechanical design and manufacture and its automation specialty is an important part of

cultivating students' practical ability and innovation ability. Practice teaching is the main way to improve college students' quality and employment competitiveness. In the process of transformation and development of mechanical design and manufacture and its automation major, we should combine them with the economic reality of the region. According to local conditions, we must cultivate the ability to apply high-quality talents and improve the employment and entrepreneurial ability of college students. We should reform the teaching methods and contents of "light practice, emphasizing idea" in the teaching of colleges and universities, and solve the problem of shortage of teachers in practical teaching.

2.1 Increases the Proportion of Courses Taught in Practice

To increase the proportion of practical teaching in mechanical design and manufacture and its automation major, to construct a teaching system with practice and employment as the main content, to reform the teaching mode, and to strengthen the proportion of practical teaching in the course arrangement. It is emphasized that the teaching content should be guided by ability cultivation and employment practice, and an independent comprehensive practical education system should be formed, in which practical skills and operational skills are coordinated.

2.2 Change the Method and Content of Practical Teaching

In the background of transformation and development ,

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the practice teaching reform method and content of mechanical design manufacturing and its automation specialty is mainly to increase the confirmatory experiment and reduce the teachers' demonstration work. To change the situation in which college students always rely on their teachers to complete their experiments, improve students' enthusiasm in practical teaching, improve students' autonomous learning ability, exercise their independence and creative ability, and make the practical teaching program carry out smoothly. Promoting the combination of practice Teaching and production practice in Mechanical Design and manufacture and its Automation Specialty

2.3 Strengthening the Base Construction of Practical Teaching

In the context of transition, strengthening the Base Construction of Mechanical Design and manufacture and the practice Teaching of Automation Specialty, it can improve the work efficiency of the school and the big enterprises to educate people together. The advanced experimental teaching base can promote the basic construction of our higher education production, study and research platform. Generally speaking, off-campus practice bases have the advantages of high scientific research level, fast production and operation efficiency, advanced technical management methods, and so on. The practical teaching platform of school can make full use of the practical teaching resources of enterprises, relying on the strong of the enterprise, establishing the platform of mutual development of the complementary and complementary development of the school-enterprise, jointly educating people, and promoting the students' professional accomplishment, to realize the common progress of local regional economy and social science and technology, and to promote the cooperation between schools and enterprises.

2.4 Expanding the Teaching Staff of Practical Teaching

Under the conditions of transformation and development, expand the Construction of Teachers in Mechanical Design and manufacture and its Automation Specialty, to improve the construction of the whole teaching staff in colleges and universities. Through arranging teachers with high academic qualifications, rich experience and strong practical ability to give extracurricular guidance to students in practice, to get students to apply for a job in a related enterprise, exercise to improve students' practical ability and the level of practical teaching in schools. Besides, experts or technicians who are rich in the design and manufacture of machinery and its automation operations may also be employed, to work as a part-time teacher for students, to guide their practical training work, to guide

their graduation design, and to form a practical teaching team with reasonable structure and excellent teaching.

3. The Content of Practical Teaching Reform of Mechanical Design and Manufacture and Its Automation Specialty under Transformation and Development

The strength of practical ability is an important index to evaluate the quality of applied talents in an enterprise. The practical teaching of mechanical design and manufacture and its automation specialty is an important method to improve students' practical ability and innovation ability. To adapt to the changing conditions of the transition, mechanical design and manufacture and its Automation Specialty in the process of Comprehensive Reform, The requirements of the manufacturing industry mainly around the main areas of our country, research and development of a talent training model based on the combination of Industry, teaching and research "the Depth Cooperation between School and Enterprise", promote the experiment Teaching Reform of this Specialty through this Mode, through strengthening the Cooperation between mechanical design and manufacture and automation specialty and enterprise in practice teaching, to enable students to experiment, practice and graduate design in class, the comprehensive, multi-level and multi-domain experience of the excellent resources brought by the combination of school and enterprise can improve the steps of the construction of the school and enterprise resources, promote the establishment of the teaching practice platform, and improve the students' mechanical design ability and practical operation ability.

3.1 Establishment of an Independent Comprehensive Practice Curriculum

The comprehensive reform of mechanical design and manufacture and its automation specialty is to integrate the basic course contents of the subject with the practice. To set up the main contents of "Comprehensive experiment of Mechanical Foundation", and to put the core courses and professional courses of mechanical design and manufacture and their automation major into basic experiments. Through the integration of the different directions of the professional development, form "Comprehensive Experiment of Advanced Manufacturing Technology" and "Comprehensive Experiment of Mechanical Design". Reform of practice teaching in mechanical design, manufacturing and automation specialty under transformation and development, the experiment course of comprehensive development has changed the development mode of traditional teaching experiment in our country. The limitation

of curriculum content is removed. By setting up a comprehensive design experiment with the integration of various professional knowledge points, multi-course fusion and adding elective experiments, to meet the requirements of students for the increase in the number of experimental courses in course teaching, enhancing the integration of professional knowledge with basic disciplines, arouse students' learning enthusiasm and initiative in practical teaching, to improve the teaching effect of learning and to broaden the students' horizons, to enhance the students' ability of thinking, innovation and practice, and to improve the openness of mechanical design and manufacture as well as the course experiment of automation major.

3.2 Self-made Experimental Equipment

The major of mechanical design and manufacture and its automation are mainly divided into two research directions: mechanical manufacturing automation and mechanical design automation. This paper evaluates the students' practical ability through two different directions of mechanical design and manufacture and their automation major. By designing and adopting different training schemes, two coordinated training platforms such as "Comprehensive training system for Machining process" and "Integrated training platform for Optical Machinery and Electrical Integration" can be made. Through the "Comprehensive training system of Machining Technology", the theory of machining technology as the core content can be quickly combined with the professional practice and training, and it can be widely used in the related course design, experiment and graduation design. It makes up for the blank in the practice teaching of machining technology and equipment in our country, and improves the study efficiency of students. The "Integrated training platform for Optical and Electrical Integration" is a multidisciplinary knowledge integration platform which integrates mechanical, electronic, optical, control and computer network technologies. Under this platform, open or project-based practical teaching can be carried out to accomplish the multi-purpose of professional teaching from design, wiring system and debugging. By using the self-developed and self-made comprehensive practice platform, several design experiments with comprehensive properties are studied and designed. Greatly increase the proportion of comprehensive performance and design performance in teaching practice of mechanical design, manufacturing and automation specialty. Strengthen the flexibility of subject teaching, combine discipline theory with discipline practice, improve the efficiency of theory transformation and practical skills, and improve the teaching effect of practice teaching. The

self-made teaching method of the experimental equipment has improved the teaching level, scientific research ability and education level of the teachers in colleges and universities. It promotes the enthusiasm of students to participate in practical teaching widely, promotes the popularization of teaching methods of promoting learning by research and training hands, increases the students' understanding of specialized knowledge, and improves the enthusiasm of students in learning. Improve students' ability to innovate.

3.3 Innovative Practical Teaching Management Model

Innovate the management mode of mechanical design and manufacture and the practice teaching of automation specialty, deepening the theoretical Teaching contents of majors and training students' practical and innovative abilities. The practical teaching of this major is usually organized by the experimental teacher.

But there are often situations where the content of the experiment is not closely connected to the experimental course. Reduce the teaching quality of experimental teaching. Some experimental courses are limited by the number of laboratory equipment, so that the number of experimental groups designed is small, and the number of students in each group is larger, and students have less chance of actually doing it. It is also very difficult to control the attendance of students, which cannot guarantee the teaching quality of students. These problems have seriously affected the improvement of the quality of practical teaching in our country. Therefore, we should explore the mode of practice teaching innovatively, and develop the practice teaching mode of "three combinations, single and four". This teaching model is to record the actual state of the experiment by strengthening the experimental content of practical teaching, reasonable experimental grouping, experimental hours and student attendance. So that colleges and universities, teaching teachers, and lab teachers can go through the form of experimental records, to realize the management mode of practical teaching content and experiment, experiment teacher and course teacher, experiment grouping and attendance rate, and the dual phase coordination of experiment hours and experiment content, in the real sense of experiment, the management of experimental teaching has continuously improved the teaching management effect of mechanical design and manufacture and its automation specialty, improved the experimental teaching results, and cultivated the basic earnest and realistic working attitude of college students. Improve the degree of opening of the laboratory, so that the test rate as high as 100%.

3.4 Increase the Tightness between Subject Competitions and Curricula

The course design of mechanical design and manufacture and its automation is mainly to transform the theoretical knowledge of mechanical design and manufacture and its automation into practical knowledge. Let students improve the ability of transforming theoretical knowledge into practice, and cultivate students' comprehensive quality. By arousing students' interest in mechanical design and manufacturing course design. To meet the diverse learning requirements of students, the training competition, mechanical design competition and other disciplines into the mechanical design and other related courses, Let the students take the group as the unit to carry on the professional discussion, launch the curriculum design, increase the flexibility of the mechanical design and manufacture and its automation specialty, cause the students' thought upsurge, improve the students' practical ability and team cooperation ability. Enhance students' creativity.

4. Conclusion

The ultimate goal of training all kinds of high-quality talents in colleges and universities in China is to provide huge assistance for the local social and economic development. Under the condition of Transformation and Development, the practice Teaching Reform of Mechanical Design and manufacture and its Automation Specialty, Train applied talents, Improving students' practical and innovative abilities, Cooperation between schools and enterprises, through the discovery of deficiencies in the practice of reform, According to the educational situation of the school, it is necessary to maximize the benefit of the reform of mechanical design and manufacture and its automatic teaching practice.

References

- [1] Hongyan Shao, Haining Yu. Practical Teaching of Mechanical Specialty under the Mode of Applied undergraduate training[J]. Journal of Guiyang University (Natural Science Edition) (2007), (04): 29-33. (DOI:10.3969/j.issn.1673-6125.2017.04.008)
- [2] Junyan Fan , Jiangling Fan, Guoxing Wu. Comparison and practice of Applied undergraduate Mechanical Design and manufacture and its Automation Specialty training Program[J]. Modern vocational education (22): 8-11. (DOI:10.3969/j.issn.2096-0603.2017.22.002)
- [3] Qian Dai. Reform and practice of Modular Teaching for Machinery Design, manufacture and Automation in Secondary Vocational School[J]. (21): 256. (in Chinese)
- [4] Zhidong Huang. Reform and practice of graduation Design of Mechanical Design and manufacture and its Automation Specialty under the background of Transformation [J]. Journal of Liaoning Institute of Science and Technology, 2007, (03): 41-42. (DOI:10.3969/j.issn.1008-3723.2017.03.017)
- [5] Yongcheng Zhao, Ling Lu. Reform and practice of Applied talents course system for Mechanical Design and manufacture and its Automation Specialty[J]. (35): 76-77. (DOI:10.3969/j.issn.1674-120X.2016.35.045)
- [6] Xiuyan Zhang, Rui Cheng. Exploration and practice of Mechanical Design and manufacture and training Mode of Automation Major in Applied undergraduate University[J]. (23): 105-106. (in Chinese)
- [7] Wanqiang Hu. Exploration and practice of Comprehensive Reform of Mechanical undergraduate Specialty under the background of Transformation[J]. Journal of Xuchang University, 2005, (05): 132-135. (DOI:10.3969/j.issn.1671-9824.2015.05.029)