

Exploration and Practice of Construction of Innovative Platform for Engineering Training of New Engineering Talents

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Fund Project: Research and reform project of undergraduate education and teaching in autonomous region (Project number: 2020JG006).

Abstract: Based on the principle of educating people, this text creates the curriculum system of engineering training practice innovation platform for new engineering talents training, comprehensively improves the quality of higher education, and improves the quality of personnel training, so as to performs the four basic functions of scientific research, personnel training, social service and cultural inheritance. This paper explores the multi-level engineering practice training ideas for engineering college students from engineering understanding, engineering training, engineering comprehensive practice and innovation, in order to continuously improve students' engineering practice ability and professional quality, and lay a solid foundation for their employment and further study.

Keywords: Engineering Training; Curriculum System; Teaching Methods; Teaching Reform

1. Social status and school status

At present, the scale of China's higher education system is large, but the structural problems of higher education cannot be ignored. In the past two decades, the rapid promotion of higher education popularization has increased the number of college graduates year by year, resulting in the increasingly prominent employment problem of college students. It is difficult for many enterprises to find the desired applied talents, especially the mismatch between the supply of mechanical manufacturing talents in higher education and the talent demand of enterprises, which makes it difficult for college students to find employment and enterprises to recruit talents. Based on the principle of education oriented, this paper creates the curriculum system of engineering training practice innovation platform for new engineering talents training, comprehensively improves the quality of higher education, and improves the quality of personnel training, so as to performs the four basic functions of scientific research, personnel training, social service and cultural inheritance. This paper explores the multi-level engineering practice training ideas for engineering college students from engineering understanding, engineering training, engineering comprehensive practice and innovation, in order to continuously improve students' engineering practice ability and professional quality, and lay a solid foundation for their employment and further study.

2. Thinking on the establishment of curriculum system

According to the particularity of engineering training practice course with long cycle and continuous time, the engineering training practice innovation curriculum system of new engineering talents training oriented by application training ability

is established. The establishment of the curriculum system is based on the professional talent training program. It connects with the requirements of engineering practice ability training of students of different grades from three levels of engineering cognition training, engineering practice training, engineering comprehensive practice and innovation. The teaching content is from easy to difficult, from basic to comprehensive, which conforms to the cognitive law of human beings. Among them, engineering cognition practice mainly allows students to experience industrial production site, understand engineering status and discipline development, and popularize basic engineering knowledge. It enables them to understand technical means, strengthen the learning concept of combining theory with practice, and initially establish engineering concept, as well as stimulate interest and curiosity. In the learning process, students will understand common engineering materials, common processing equipment, processing principle of common machining equipment, basic processing technology of conventional parts, cutting tools, measuring tools, fixtures and auxiliary tools in common processing technology system and the most basic operation of machine tools, so as to establish students' awareness of safe and civilized production; engineering practice training enables students to understand technical principles and master operation skills, experience the process of engineering, and strengthen the concept of practice, in order to establish engineering awareness, and cultivate engineering literacy and technical practice ability. Students will be trained in various material forming processes such as lathe processing, fitter, planning, milling and grinding, thermal processing, numerical control and 3D printing, and master the production of common shaft, sleeve, disc, box parts and simple structural parts in engineering application. Comprehensive engineering practice and innovation cultivate students' comprehensive engineering practice ability and innovation ability, fully embody the comprehensive, design and independent advanced teaching concept and interdisciplinary, and take into account the basic, cutting-edge and the requirements of the times; it can stimulate students' potential, cultivate innovative consciousness and innovation ability, and improve students' autonomous learning and independent work ability; it can enhance students' healthy psychology quality and team cooperation ability, familiar with and master the project research and development process and experience the product research and development process; the teaching process follows the typical engineering problem approval, project analysis, scheme determination, project implementation, project evaluation process sequence, so that students can further integrate and sublimate the theoretical courses and practical courses, and lay a foundation for students' employment, entrepreneurship and further study.

Through the reconstruction of engineering training practice curriculum system of different majors in engineering colleges and universities, the establishment of the curriculum system connects with the requirements of engineering practice ability training of students of different grades from three levels of engineering cognition training, engineering practice training, engineering comprehensive practice and innovation. The teaching content is from easy to difficult, from basic to comprehensive, which conforms to the cognitive law of human beings. In the early stage of curriculum setting, it is necessary to sort out and classify the requirements of engineering practice training ability of each specialty, not only to grasp the differences of each professional ability requirements, but also to find out the generality of each professional ability requirements, classifying and carrying out curriculum setting for three different levels. The design of teaching content is closely related to the training requirements of classified professionals, and the teaching resource database is established in the form of teaching modules, so as to make the cultivation of students of different majors and levels more targeted. Through improving the quality monitoring system to supervise and feed back the teaching process, problems can be found and solved in time to ensure the steady and improvement of teaching quality. The quantitative evaluation and assessment system makes a comprehensive evaluation on the teaching process and teaching effect, laying a foundation and providing basis for further teaching optimization and reform.

3. Reform measures

According to the differences and commonness of the ability requirements of students of different majors, the curriculum is designed for three different training levels. Among them, engineering cognition training and engineering practice training emphasize more on the generality of students' practical ability training, while engineering comprehensive practice and innovation emphasize more on the differences of students' practical ability cultivation. According to the conventional parts manufacturing process system involved in machine tools, cutting tools, measuring tools, fixtures, auxiliary tools

and molding engineering materials, related knowledge is linked to improve students' engineering cognition. At the same time, the ideological and political elements are excavated, the library of ideological and political elements is established, students' awareness of safety, civilization and responsibility is established, and the spirit of craftsman in a big country is carried forward.

According to the requirements of different majors for students' engineering practice ability, the engineering practice training course selects the typical processing carrier. Based on the working process, the carrier selection is closely related to the learning major. According to the knowledge and ability to complete the processing carrier, the learning content is constructed. The engineering practice training course pays more attention to the students' ability of drawing recognition, processing technology analysis, machine tool operation and parts detection in the manufacturing process. In the teaching process, not only the students' awareness of safety, civilization and responsibility should be established, but also the students' sense of teamwork should be set up.

Xinjiang's machinery manufacturing industry is mainly oriented to petroleum, agricultural machinery, mining machinery and coal chemical industry and other fields. The curriculum of engineering comprehensive practice and innovation needs to extract typical engineering problems through in-depth investigation of relevant enterprises, and further evolution and reorganization to determine the typical work tasks. According to the knowledge and ability involved in the typical work tasks, based on the personnel training and work process, to excavate the ideological and political elements, construct the learning content, and decompose the learning content, so as to determine the final learning task. Through the cultivation of students' engineering comprehensive practice and innovation, the professional education and market demand can be better combined, which is conducive to improve the employment adaptability and innovation ability of mechanical graduates, and also help to realize the education idea of "education oriented, quality first" and "comprehensive development of quality".

Assessment is a comprehensive evaluation of students' overall learning situation, including learning process and results. The evaluation results can be synthesized from many aspects. A good evaluation system will better stimulate students' enthusiasm for learning. In engineering training under the academic year system, the final score of students is composed of the usual performance and the final assessment result. The usual score accounts for 30%, which is the assessment of students' attendance, and the final score accounts for 70%. However, the composition of the results cannot fully reflect the whole process of practice and the learning situation of each work type. In view of different internships, the composition of the results cannot fully reflect the whole process of practice, because of the different project and instructor, failing to the ultimate unity.

4. Conclusion

Based on the analysis of the current situation of social talent demand and school education, this paper puts forward the idea of building engineering practice innovation curriculum system, and discusses the main reform objects such as the teaching process, teaching content and teaching mode. According to the ability requirements of different grades of students, the teaching level should be positioned, and the knowledge and ability of teaching level should be based on the working process to excavate the ideological and political elements and construct the teaching content. The teaching process takes the teaching module as the bright line, the cultivation of students' knowledge and ability as the dark line, takes the teacher as the leading role and the students as the main body, and integrates theory and practice into one. It lays a theoretical foundation for the establishment and reform of the later engineering comprehensive practice course.

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