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Reform Exploration of Research Practical Teaching of Civil Engineering Discipline under the Integration of Enterprise and University

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Abstract: In order to further improve the research practical teaching effect for civil engineering discipline and establish the training objectives of research-based practical teaching for civil engineering discipline, universities and colleges should rely on the integration of production and education and school-enterprise cooperation to reform and innovate the practical teaching mode. Through the research on the research practice teaching mode of civil engineering discipline under the background of the integration of industry and education, the ability of civil engineering discipline to carry out research practical learning and solve complex engineering problems is strengthened, and the industry backbone of civil engineering discipline facing the future and developing in an all-round way is cultivated. Improving the quality of talent training is the core and foothold of the integration of production and education.

Keywords: integration of enterprise and education, Practical teaching, civil engineering discipline, Innovate, reformation

1. Introduction

The report of the 20th National Congress of the Communist Party of China proposed to comprehensively improve the quality of independent training of talents and strive to create top-notch innovative talents. At present, universities generally attach importance to the research-based teaching of theoretical courses, while the research-based teaching of practical courses is relatively weak, so the drawbacks of the traditional teaching mode of civil engineering majors are gradually exposed. Therefore, the establishment of high-level personnel training system is an urgent requirement for undergraduate universities to train academic and research-oriented talents. Under the background of the integration of production and education, colleges and universities need to further reform the practical teaching mode, improve the talent training mode, and enhance the teaching level of teachers in order to achieve better teaching results. Strengthen the training of civil engineering students to carry out research practice learning and solve complex engineering problems.

2. Deficiencies in the research-based practical teaching mode of civil engineering

2.1 Prominent problems that emphasize theory over practice

Practice is students' hands-on ability, which refers to students' ability to find and solve problems. At present, a common problem in colleges and universities is that there are too many lectures on theoretical knowledge and less practical teaching, and the "50% of theory and practice" only stays in the teaching plan, which can not be implemented in proportion to the actual teaching, thus affecting the cultivation of students' practical ability. Civil engineering is a practical activity, which is the process of transforming drawings into entities, exercising and improving students' practical ability and opening up innovative thinking. In teaching, the school should cultivate students' solid professional knowledge and excellent work style through various ways and forms, strengthen students' practical ability, and cultivate excellent engineering and technical personnel for the country and society.

2.2 The integration between teaching content and enterprise is not high

Teaching content is the direct source for students to acquire knowledge. The cutting-edge, scientific and practical teaching content is not only the key factor affecting the quality of personnel training, but also an effective way to ensure that civil engineering majors have the characteristics of integration of production and education. The arrangement of practical teaching links in colleges and universities is out of line with the requirements of real industry, and the teaching quality is difficult to guarantee.

In the teaching process of civil engineering in colleges and universities, students' practical ability, basic knowledge and innovative thinking should be cultivated and improved in all aspects through the combination of theoretical knowledge and practical activities. So that it can play its due role in the various stages of civil engineering scheme design, technology optimization and process adjustment. However, in the actual teaching of

civil engineering in colleges and universities, the defect of insufficient innovation has become increasingly prominent. In the course of teaching, teachers only repeated explanations and experiments on textbook content, and did not leave enough space for students to play freely, so that students' innovation ability could not be greatly improved. It seriously hinders the growth of students in colleges and universities, and also violates the basic teaching principles of cultivating students' innovative thinking.

3. Innovation and reform of research practice teaching model for civil engineering

3.1 Establishing the research practice teaching training objectives of civil engineering

According to the goal of overall integration of education and industry, colleges and universities should deepen the integration of production and education, keep up with the actual needs of enterprises, refine and closely align the course characteristics of the industrial chain, formulate demand-oriented course objectives, improve the talent training model that meets the needs of the industry, and enhance the positive role of education in economic development and industrial upgrading. On the one hand, closely combining the characteristics of economic development and the actual situation of industrial development, the integration of industry and education to create curriculum characteristics is conducive to cultivating high-quality talents who meet the needs of regional economic development and seamlessly docking with the industry. On the other hand, in order to avoid the fierce homogenization competition in the supply of talents education and reduce the waste of educational resources, the characteristics of the training of talents with the same specialty in major colleges and universities are analyzed, the training of talents with different characteristics is explored, and the curriculum characteristics of talents without others are created, talents have their own advantages and talents have their own advantages are created, which is conducive to optimizing the educational structure and building a benign development pattern of the integration of production and education. Relying on the combination of schools and enterprises, enterprises participate in the talent training of colleges and universities, propose the talent training goals from the perspective of enterprise needs, and jointly develop curriculum syllabuses, teaching materials, experimental training instructions and other teaching materials, so as to achieve seamless docking of teaching content and industrial needs, and cultivate high-quality talents who meet the needs of industrial posts.

With research-based practical teaching as the core, it simultaneously strengthens theoretical courses and practical classes to cultivate future-oriented and all-round industry backbone.

3.2 Establishing a virtual platform to provide more practice opportunities

With the continuous progress of computer technology in our country, it provides a new development direction for the practice teaching of civil engineering specialty. The working principle of the virtual practice platform mainly uses the simulation technology to conduct a comprehensive and complete force analysis on the basic components and structural systems of engineering structures. And through the establishment of exclusive teaching database, it provides greater convenience for the optimization and adjustment of practical teaching work. By establishing a virtual practice platform, students can be provided with sufficient practice opportunities, and the economic expenses of civil engineering teaching can be reduced, so that the daily operating costs of colleges and universities can be greatly reduced.

3.3 The combination of schools and enterprises to improve independent learning ability

In recent years, in order to meet the needs of modern industrial development, the integration of production and education and the cooperation between schools and enterprises is a new model of vocational education, which makes full use of the existing resources of both schools and enterprises. Through the combination of colleges and universities with relevant enterprises, students can integrate into the working environment in advance, enhance their adaptability to the working environment, and apply the theoretical knowledge learned in the classroom to the actual production of enterprises, so that students' independent learning ability has been significantly improved. Build a practice base with enterprises, reform the teaching model, cooperate in scientific research, realize the training of research practice teaching, and explore the organizational structure and education model of co-construction and co-management. The internship at the construction site or construction enterprise in the last semester is another important practical teaching link for civil engineering students to cultivate their vocational skills and working ability. On the premise of ensuring the total amount of students' practice, it is necessary to realize multi-semester work-study alternations through school-enterprise cooperation according to the actual needs of teaching work, and arrange students' practice in stages.

3.4 Optimizing the research-based practical teaching curriculum system under the background of production-teaching integration

To improve the connotation of school-enterprise joint education, reconstruct the curriculum system of

research-based practical teaching, optimize the teaching content, and form a research-based practical teaching training model integrating production and education. Curriculum is the main carrier to ensure that the school achieves the teaching goal, and the undergraduate university should optimize the curriculum and promote the integration of production and education to achieve the goal of talent training. At present, the employment direction of civil engineering students is mainly all kinds of engineering construction enterprises and bidding enterprises. Therefore, schools with civil engineering majors can set course content according to the technical requirements of enterprises: enterprises can participate in the process of school curriculum reform, including major adjustment direction, textbook adaptation, teaching plan preparation and other aspects, and enterprises can clarify the demand for future talents and the qualities that talents should have.

By integrating the superior resources of both the university and the enterprise, innovating research practice teaching methods, designing the overall practice curriculum system, increasing the proportion of research practice teaching in the civil engineering industry, and promoting the organic combination of theoretical knowledge, scientific research ability and professional quality.

To meet the needs of industry and regional development, we have added practice courses of "research-based teaching" under the background of the integration of industry and education, carried out cooperative education for international needs, added courses of international laws and regulations, standards and norms, natural and cultural environment, and constantly improved personnel training programs.

3.5 Gathering high-quality engineering education resources to improve the teaching quality

Establish school-enterprise practice mobile positions, select young teachers to take temporary positions in enterprises, introduce outstanding talents from enterprises, set up high-level innovation teams, innovate the training mechanism of young teachers' research-based practice teaching, and improve their research-based practice teaching ability. Select and send outstanding teachers to visit and exchange in universities at home and abroad, broaden their horizons, learn advanced research practice teaching concepts and experience, and improve the internationalization ability of research practice teaching teachers. Make full use of the advantages of local industry, cultivate the practical ability of young teachers by integrating production and education, and improve the proportion of dual teachers; Build a relatively stable contingent of part-time teachers with rich practical experience. Then build a "double teacher" construction system with the core of improving teaching ability. At the same time, teachers can also conduct independent learning and training through high quality classes, famous teacher studios and online teacher training platforms to achieve the purpose of improving their own teaching level.

4. Conclusion

Facing the demand of employment under the new situation, colleges and universities should take the initiative to cultivate professional quality under the environment of integration of learning, production and teaching, and establish the construction concept of students' employment and entrepreneurship. In combination with the characteristics of colleges and universities and the needs of the development of local enterprises, we should actively improve the teaching methods and optimize the course content. Through the construction of a new talent training model, to create a teaching and practice platform conducive to improving the employment and entrepreneurship ability of civil engineering students, so as to further improve the employment and entrepreneurship ability of students, to provide sufficient professional talents for the construction and development of civil engineering in China.

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