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Innovation and Practice of Graduation Design Teaching Mode for Civil Engineering Major under the Integration Background of Industry and Education

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Abstract: The graduation design of civil engineering graduates plays an extremely important role in engineering practice. The "integration of industry and education" is also an inevitable trend in the development of civil engineering specialties. At present, the graduation design of civil engineering majors has a single graduation design topic, lack of novelty; less reference specification, less contact with engineering practice and other problems. This paper makes a detailed discussion on the current problems of graduation design of civil engineering majors, and puts forward suggestions for teaching mode innovation and practice in the context of "integration of industry and education".

Keywords: industry-teaching integration; civil engineering; graduation design; innovation

1. Integration of industry and education

The integration of production and education means that enterprises and schools jointly carry out personnel training through personnel training, education and teaching activities. Its core is to realize the development and utilization of human resources, promote the implementation of the strategic objectives of enterprise development, and also meet the employment needs of students. That is, the integration of production and education, teaching in production practice and production in teaching, the two are interrelated, closely combined and inseparable. As the main trend of the development of major majors, the integration of production and education will have a strong impact on the teaching structure of each major. As the main body of these majors, colleges and universities carry out the integration policy of production and education plays a heavy role. However, in the process of implementing the integration policy, some problems will inevitably occur, such as inaccurate positioning of universities, unclear interests of all parties, and temporary and unstable integration of industry and education[1-3].

The report of the twentieth CPC National Congress points out that it is necessary to promote the integrated development of vocational education, higher education and continuing education, strengthen the integration of vocational education and popularization, the fusion of industry and education, and the integration of science and education, and optimize the positioning of the types of vocational education. Promoting the in-depth development of the integration of industry and education has become a necessary path for the high-quality development of vocational education in China. To promote the integration of vocational education, it is necessary to do a good job in three aspects of work, first, improve the macro-integration mechanism, the need to incorporate vocational education into the economic development strategy at the national level and regional level, with the same planning, with the same deployment; secondly, to strengthen the organization of innovation and innovative institutions and mechanisms, to promote the education chain, the talent chain, and the industrial chain, the innovation chain and the integration of the organic integration of vocational education, the integration of vocational education; thirdly, to strengthen the construction of vocational education standards system and take the standard as a traction to guide the organic docking of education chain and industry chain to realize the universal improvement of the quality of vocational education [4-5].

The integration of industry and education is also of great significance for the development and transformation of colleges and universities. It is conducive to the innovation and entrepreneurship reform of college education and promotes the development of college education to a better aspect. It is beneficial to stimulate students' interest in learning and cultivate their ability of innovation and entrepreneurship. It is helpful to improve the engineering practice ability of engineering teachers. It is helpful to alleviate the shortage of local university funds and promote local economic prosperity at the same time. Can better promote the employment of college graduates docking problems.

2. Problems in graduation design of civil engineering majors

2.1 Graduation design topic selection is old and lacks novelty

When selecting the topic of the graduation project, some instructors did not fully consider whether the graduation project met the social needs and the development status of the industry, and always used the old topic[6], which is inconsistent with the actual project and even "backward" in the current practical project, and lacks due value and significance. For a long time, there is no lack of plagiarism and use of the wind, students cannot really effectively grasp the corresponding knowledge and ability. Graduation project topics are old, or mainly design, lack of novelty, which is also a main reason for students' lack of interest in graduation project. In addition, in terms of the current civil engineering graduation design in most schools, the teacher's opinion plays a "decisive" role in the graduation design, which also leads to students in the graduation design project too dependent on the instructor, lazy thinking or not thinking, seriously lack of students' own opinions and innovation. Graduation project instructors should try to avoid the same or similar topics, and the topics selected for students should have certain novelty, and should conform to the current project practice, so as to avoid falling behind the current project practice. It is necessary to try to connect with the reality of social engineering, and to design the topic according to the social needs and the development of students' graduation and employment.

2.2 Few reference specifications for graduation design

In traditional graduation design, students mainly refer to the textbook example content, are not familiar with the latest professional design specifications, professional standard atlas, professional construction manual, and do not spend time to read these design materials. Students rely on textbook examples for graduation design, which inevitably leads to some textbook errors. Students do not consult relevant norms, resulting in design errors. As a result, students' design results can only be discussed on paper and cannot be used in engineering practice. As far as the direction of housing construction is concerned, students need to use 06SJ813 General Principles of Civil Building Design and GB50016-2014 building design fire protection code when they carry out their graduation design. However, in the actual graduation design, students often do not refer to these specifications, thus making some low-level mistakes, such as the selection of some scales does not conform to the building module, and these problems are found after the completion of the architectural plan sketch to the teacher, resulting in a waste of time. In short, the importance of civil engineering design code can not be ignored. Reasonable design specifications can improve the quality and safety of the project, reduce the construction cost, protect the environment and resources, which is the key factor for the successful implementation of civil engineering. Therefore, in the design of civil engineering, it must be carried out in strict accordance with the norms to ensure the rationality and scientific design scheme, and provide guarantee for the construction of safe, efficient and sustainable projects.

2.3 Graduation projects lack teamwork and are mostly completed independently

Civil engineering as a comprehensive professional, many work is not independent, it needs many professionals to communicate with each other, help each other to complete. Nowadays, not only civil engineering industry, in fact, all industries need teamwork. Nowadays, most civil engineering projects are large-scale comprehensive projects, which require the cooperation of the construction side, the design side, the construction side, the supervision side, the material supplier, the local government and other aspects. Only a person or a team can not complete all the projects, so the sense of teamwork is crucial. However, in the process of graduation design, this kind of teamwork spirit is extremely lacking. Taking the graduation design of housing construction project as an example, including the overall layout and size selection of the beam structure, the comparison and selection of the beam structural design scheme, the construction method design, construction drawing, reinforcement configuration and other links, most of the graduates are completed independently through pkpm software, which is conducive to strengthening students' learning. But after all, the graduation project time is limited and everyone has different levels of professional knowledge. Not every student can master these software skillfully and not be good at all aspects of graduation project. If this problem cannot be solved, many students will waste most of their time in this step. Give full play to everyone's advantages, and work together efficiently to complete the graduation project.

2.4 Graduation design has little relation with graduates' employment direction

Civil engineering as a comprehensive housing construction, underground space, water supply and drainage and other professional major, its annual employment rate of graduates is also high. However, a careful study finds that the job graduates choose after graduation has little correlation with their graduation project, or even with the major they have studied during the undergraduate period. For example, the graduation project of students who study housing architecture is the design of dormitory buildings in a certain school, but they choose

road construction after graduation, which cannot help but make people feel that the graduation project is only a graduation task, thus ignoring the relationship between it and employment. This is also a key factor that leads to graduates not paying enough attention to graduation design.

3. Innovative thinking and practice

3.1 Scientific and rational selection of graduation design topics according to the students' graduation destinations.

To understand the employment direction of graduates in advance, according to the students themselves, scientific and reasonable selection of graduation design topics is the key to a good graduation design. In the selection of graduation project, the "main body" status of students should be placed correctly, the graduation project selection should fully consider the personal will of students, in line with the principle of personalization and different people, comprehensive consideration of students' personal interests and graduation direction, professional basis, etc., to choose the most appropriate graduation project. In addition, according to the graduates' major and employment direction, they can reasonably choose topics in the direction of housing construction, roads, Bridges, water supply and drainage. Students who have been recommended for graduate school or plan to enter the postgraduate school can formulate relevant research topics according to the research topics of the instructor or the research direction they are interested in during the postgraduate period, cultivate the interest of such students in scientific research, and understand the basic scientific research methods and steps and master the basic scientific research skills through the graduation project. Through these measures, we can maximize the relationship between graduation project and graduates' employment, give full play to the main role of students in graduation design, and mobilize students' enthusiasm for graduation design.

3.2 According to the selected topic, reasonably provide relevant specifications

The graduation design of civil engineering majors generally includes the directions of building construction, underground space, road and bridge, water supply and drainage, etc. After guiding teachers select relevant graduation design topics according to students' own interests, they should provide a certain number of relevant norms according to the selected topics for students' reference. Compared with students, instructors have more experience and know more about the relevant norms. They can also provide students with relevant websites and public accounts to consult the norms, so as to make the best use of them. Civil engineering design code refers to the design scheme formulated according to certain standards and regulations, its importance is mainly reflected in the following aspects:

(1) Ensure the quality and safety of the project

The standardized design can ensure the quality and safety of the project. Through the formulation of reasonable design specifications, it can ensure that there will be no structural instability, load overload and other safety hazards in the construction and use process, and reduce the probability of engineering accidents to the greatest extent.

(2) Improve engineering efficiency

Standardized design can improve the construction efficiency of the project. Design specifications usually contain provisions on materials, construction technology and other aspects, which can enable construction personnel to operate in accordance with the specifications during the construction process, reduce the interference of human factors, and improve the efficiency and quality of construction.

(3) Reduce construction costs

The standardized design helps to reduce the construction cost of civil engineering. Through scientific and reasonable determination of design parameters, reduce waste and redundancy, avoid some unnecessary project expenses, so as to make the optimal use of project investment.

(4) Protect the environment and resources

Standardized design helps to protect the environment and save resources. Reasonable design specifications can reduce the damage and waste of land and water resources during construction and use, and achieve the goal of sustainable development.

Graduates can get twice the result with half the effort by consulting the relevant norms and carrying out the graduation design according to the norms, and can avoid some mistakes in the principle design, and can also be better connected with the engineering practice. Graduation design is an important link to achieve the teaching and training goals of civil engineering major. By providing relevant norms, teachers can better standardize graduation design and promote students' good habit of looking up information.

3.3 Strengthen team cooperation and cultivate team consciousness

In the process of graduation design, more discussion teaching is used, which can form a discussion atmosphere. Since the students are similar in age and have similar knowledge and feeling ability, the "team cooperation mode" can encourage team members to learn from each other, supplement and inspire each other, and all team members can develop their own qualities and achieve common progress, which lays a foundation for improving the teaching quality of graduation design. While explaining the design ideas and elaborating the reasons for the idea, it can improve the students' language expression ability and argumentation ability. Through teamwork mode, it can not only reduce the pressure of graduates' graduation design, but also allow students with higher professional level to exert their ability to guide some students with lower professional level. They are similar in age and it is convenient for them to exchange ideas. The team relies not only on collective discussion and decision-making, information sharing and standard strengthening, but also emphasizes that real collective results can be obtained through the joint contribution of members. Therefore, teamwork can often stimulate the incredible potential of the group, and the results of collective cooperation can often exceed the sum of individual performance of members. Civil engineering graduates through teamwork to carry out graduation design, can comprehensively consider everyone's ideas, graduation design is more safe and reasonable.

4. Conclusion

The graduation project is the last practical assignment in the undergraduate stage. It synthesizes the professional knowledge learned by students in the past four years, and through the graduation project, it can analyze the learning situation of graduates in the past four years, which is also an important process to deepen and consolidate the knowledge learned in the undergraduate stage. Therefore, colleges and universities should find a road that meets their own situation and is not divorced from social needs, and can improve the quality of graduation design, laying a good foundation for the employment of civil engineering graduates.

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