

Research on Teaching Reform and Innovation of the Graduation Design of Civil Engineering Major

Qian He^{1, a}

¹ Department of Civil and Hydraulic Engineering Institute, Xichang University, Xichang, 615013, China

^aemail

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Abstract. Graduation design is the last comprehensive practical teaching link in the undergraduate education of civil engineering specialty. It is also an important process in the talent training program of civil engineering specialty. However, the current graduation design teaching of civil engineering major has many problems, causing that the quality of graduation design is generally not high. In view of these problems, this paper puts forward the corresponding suggestions, including Improve subject selection mechanism, reform design time mechanism and innovate quality control mechanism to provide some references for the relevant researchers.

Introduction

Graduation design is an important link for college students to apply professional knowledge to solve engineering problems, and it is also an important means to train applied talents. At this stage of teaching for students not only the consolidation of knowledge and study comprehensively, but also continue to broaden students' knowledge and cultivate their ability to solve problems, to cultivate their independent thinking habits, stimulate their interest in the future of professional work in the field of real desire. Thus, the teaching of graduation design requires teachers and students to attach great importance to the ideological, teaching content organization should also be carefully arranged, while the teaching process should be rigorous and pragmatic. Cultivating students' innovative ability is not only a slogan, but a real practical activity. The characteristics of specialized course teaching and basic theory course are teaching and learning. The purpose of teaching is to make the students lay a good foundation and accumulate knowledge. At this stage, the students' knowledge level is relatively low, the knowledge is not comprehensive enough, objectively lack of innovation. The characteristics of graduation design teaching is to use professional knowledge to solve engineering problems, in the face of some must end and real project design and project within the stipulated time, the more can stimulate the two aspects of teaching and learning innovation ability, and cultivate the students' innovation ability in the process of practice, endless joy let the students to practice the practical experience. The teacher must seek truth from facts, and actively provide the students with innovative learning environment, give students more freedom to think, freedom of choice, and to the teaching focus on improving students' working ability and learning ability, with independent thinking of students as the starting point respect their hobbies and interests, for the development of students' innovative ability to create conditions.

Common Problems of Graduation Design Teaching of Civil Engineering Major

Problem of Subject Selection. At present, the subject of graduation design of civil engineering major is mainly engineering design, and the direction of architectural engineering is mainly based on the frame structure. This is because the frame structure in terms of structure, the application of computer software, or hand calculation steps are the structure of the simplest, and all kinds of frame structure of the graduation design book is everything in the market. From the breadth of the topic, all kinds of civil building design accounted for the clear majority, especially office buildings and

teaching buildings, while industrial buildings, construction organization and management, underground engineering design is very few. As for the research papers, the number of poor. From the depth of the selected topic, the structure form is too single, except for a few involving shear walls, the rest of most of the traditional reinforced concrete frame structure, but also limited to low rise buildings. However, like high-rise buildings and large span space is almost very few people are willing to try. The graduation design instructor provides detailed graduation design tasks, which clearly defines the design content and schedule. The graduation project of students is only a big assignment under the predetermined plan, but the design is difficult, but the task is heavy. Due to the expansion of higher education led to the number of graduates increased year by year, the number of students per instructor guidance too much, plus other teaching and research tasks, due to the limited time and energy, teachers over the years are guiding the same type of subject, similar content. Students generally feel that the graduation project and actual project derailed, there is no enthusiasm and innovation desire, and student cannot give full play to the subjective initiative.

Problem of Insufficient Attention. The arrangement of graduation design is general in the eighth semester of undergraduate stage. Now most of the graduates have successfully signed, a considerable part of the students thinks that if the graduation design qualification, which can successfully get a diploma and degree certificates will be fine. It isn't necessary, spending too much time and energy on graduation design; some students did not find the job is busy to participate in various recruitment, don't sink in the heart to make the graduation design done seriously. And a small number of graduate students to prepare for graduate interview and retest work also involves a lot of time and effort. This can affect the progress and quality of the graduation design. Some students don't pay enough attention to the graduation project itself, ignore the graduation design is the last comprehensive warm-up before going to work, to waste a good opportunity. In view of the above situation, leading to the overall quality of graduation design is not high. In the process of graduation design often have students who participate in the recruitment, interview, and other reasons not regular and absenteeism, graduation design in the late part of the notebook computer does not need computer, students cannot be moved to the desktop fixed classroom to do graduate design, make the attendance system a mere formality. In addition, the design cycle is relatively long, during the guidance of teachers and other teaching and research tasks, sometimes on the graduation design management and monitoring is not in place, the student level is uneven, some students do not get effective supervision and the problems are not let things drift, take the initiative to contact the instructor, resulting in design progress is seriously lagging. The design of pre-graduate slack, and the late-night combat is almost every year of graduation design have a phenomenon. This high-quality design results cannot be simply guaranteed in the situation.

Problem of Design Evaluation. The fairness and rationality of graduation project assessment method is the lifeblood of students' serious and rigorous attitude towards graduation project. Considering the current graduation design of grade teachers, teachers, Defense Review Group three aspects of weight, but the specific operation also has some disadvantages. Teachers are relatively reliable results, but it usually teachers on students usually understand a handful, only by correcting the students' graduation design results in a short time the results are given. The defense team finally given results are questionable, because of the time limit and reply to answer questions, to comprehensive evaluation of students to grasp the knowledge and ability, lack of the whole process of graduation design test. In addition, the judges, the respondent group between the direction of teachers' professional study and differences, lead to results of graduation student groups cannot be compared, it also greatly reduces the students' enthusiasm for graduation design. The graduation design is the last stage of undergraduate courses, the students facing a different situation: some students are busy looking for a job, some students are busy retest, some schools do to these students relaxed policy, leading to shorten the time of graduation design. Complete the graduation design so much work in a very short period, the students actively completed the graduation design of faith is greatly reduced, but did not have time to put forward its own views on the graduation design, lack of initiative and innovation, and even some students copy the previous or with the graduation design, the quality of the graduation time greatly affected. Graduation defense is to check the quality of

graduate design, it can reflect the ability of students to master knowledge in the process of design and design creativity. If you don't pay attention to the graduation reply, will throw out during time, forming a vicious spiral.

Deepen Reform to Enhance Graduation Design Quality of Civil Engineering Major

Improve Subject Selection Mechanism. In the past few years, the graduates of the civil engineering graduates have a strong ability to practice in the field of production and management, which requires graduates to have strong practical ability. The graduation design practice teaching as a comprehensive, the first step of the research work is particularly important. The topic should be combined with the engineering practice, it is conducive to mobilize students' enthusiasm, initiative and innovation consciousness. To ensure every question, the instructor requires multi aspect and multi-channel acquisition task: the cooperation project with the construction unit or the local research design institute; can be combined with the research topic and major guidance teachers to design or research topics; can be combined with the employment of students and the characteristics of interest to study. After the selection of topics, the college set up the leading group of graduation design to carry out a collective demonstration of all topics, requiring a comprehensive knowledge structure, a full amount of work tasks, practical application. At the same time, the teachers and students with double, graduation design students and guiding teachers. Independent undergraduate graduation design proposition should be added to college students and teachers, on the one hand teachers according to their professional direction to guide the students to have contact or contact to jobs and personal interests to choose their own groups, on the other hand, two-way choice also to further enhance the enthusiasm of students and teachers and convenient arrange the schedule of students' graduation design. Complete the two-way choice after it officially entered the graduation design stage, according to the actual situation of the group, layout review has been learned related knowledge, literature search, familiar with the relevant data and standard, familiar with the relevant software, internships contact. This requires the students to do the graduation design work.

Reform Design Time Mechanism. To solve the contradiction between graduation and employment, will graduate ahead of the layout design tasks arranged at the end of the seventh semester, it increases the effective time of graduation design, carry out the follow-up work. Organize the graduation design mobilization meeting before the winter vacation, arrange the students to meet with the instructors. The tutor can give the graduation design task book to the students in advance, let the students use the vacation leisure time to seriously consider the task and requirements of graduation design, and do the training work of the basic skills such as data collection in advance. The eighth semester graduation project started second weeks after graduation practice, the main task is to combine the subject and content of graduation project for special investigation. In the design stage, through access to many students and their related research data, specification and reference, further digestion and absorption, put forward feasible design plan and conduct a comprehensive and detailed demonstration, based on carefully written report. A good report helps students to deepen understanding of the task, to reduce the blindness of time and initial stage to the graduation design and graduation design is also carried out the following work to create favorable conditions. According to the different situation of students, different graduation design types, such as structural calculation, construction organization management, engineering cost, are classified. Let the students according to their own knowledge to choose good graduation design types, such as mechanics courses students can choose a solid structure frame structure calculation, and construction of more interested students can choose the management and construction organization design. In addition, it can guide the students to choose the topic of graduation design according to the whereabouts of the students after graduation, to improve the motivation and interest of students' participation, and mobilize the subjective initiative.

Innovate Quality Control Mechanism. The routine of the college mainly includes the preliminary work examination, the mid-term examination, the defense qualification control and the performance evaluation and so on. The initial examination includes topics of graduation design students of macro control, the instructor must ensure the selected topic with professional outline, to

avoid duplication, do a staff of students, at the same time, check the students' report completion and the corresponding practice research. The mid-term examination focuses on the progress of students' literature review, foreign language translation and part of the design results. Strengthen the strength and supervision of the mid-term examination, effectively grasp the students' design progress and the existing problems, and lay a solid foundation for students to finish the graduation project smoothly. The respondent qualification examination is mainly focus on the graduation design students complete the quality department as a unit, to carry out in reply before I can complete the graduation design students to enter the formal defense process through the audit, and ordered unqualified students to modify the audit again. Performance evaluation, the establishment of the respondent group, and to take teachers and experts on the way, in strict accordance with the college respondent process, according to the completion of the quality of students in all aspects of the final performance assessment. To highlight the college personnel training application type characteristics, college and take various measures to strengthen the industry relationship. Such as the appointment of brothers' colleges experienced professional teachers, increase school enterprise cooperation, improve the campus and other bases of practice. This semester from outside the appointment with intermediate and above titles, bachelor degree or above, with expertise and enthusiasm of undergraduate education in the design, construction, cost and other related fields of industry experts on accounting for the number of the graduation teachers more than half. At the same time, in view of the shortage of teachers' experience, the school also sets up the mutual promotion mechanism between the external teachers and the teachers inside the school, which provides a favorable guarantee for the defense.

Conclusion

Undergraduate graduation design of civil engineering is a complicated and long process of teaching practice, graduation design quality not only depends on the guidance of teachers, the level of student engagement time, is also closely related with we usually learn courses, curriculum design, requires the joint efforts of teachers and students. Civil engineering specialty is a very practical specialty, and the practical teaching reform should be strengthened while learning theoretical knowledge. Through the practice of learning, students can not only master the theoretical knowledge, but also can contact engineering practice, cultivate engineering practice ability, and achieve the goal of talent training of civil engineering specialty.

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References

- [1] Li Min, Wang Zhiyun. Application of Outcome-based Education in Civil Engineering Graduation Design [J]. The Guide of Science & Education, 2017(1): 53-54.
- [2] Zhang Jinyuan, Lu Yan, Han Qinghua. Innovation and practice of graduation design of civil engineering specialty [J]. Journal of Architectural Education In Institutions of Higher Learning, 2016, 25(1): 162-166.
- [3] Yang Yongdong, Zhang Zhenning, Teng Zunli. Problems and improvement measures in the graduation design of civil engineering specialty [J]. Journal of Architectural Education In Institutions of Higher Learning, 2016, 25(3): 132-135.

[4] Meng Yangjun, Li Can. Reform and Exploration of Civil Engineering Graduation Design under the Background of Combination of Production and Education [J]. The Science Education Article Collects, 2017(1): 65-66+82.