

Teaching Reform and Practice of Engineering Project Management Course for Application-oriented Undergraduates

Jin Yang

School of Architecture and Art Design, Xi'an Peihua University, China
16606023@qq.com

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Abstract. According to the needs of the transformation and development of application-oriented universities and the characteristics and requirements of engineering project management courses, this paper expounds the formation of the idea of engineering project management course reform. Taking xi 'an peihua university as an example, this paper explores and practices the project management curriculum reform from the aspects of curriculum teaching content reform and curriculum teaching method reform.

Introduction

Engineering project management course is one of the compulsory courses for students majoring in engineering management. It studies the objective laws, management theories and methods of the whole process of engineering project construction, and closely relates to the practice of engineering construction management[1]. It focuses on cultivating students' practical ability and aims at improving students' comprehensive quality. It tries to cultivate students' comprehensive ability of engineering project management through various teaching links, so as to better meet the needs of future engineering project practice and taking relevant professional qualification examination.

With the acceleration of China's construction process in the 21st century, the national engineering construction field gradually expands the demand for senior technical personnel engaged in engineering construction, which is reflected in the demand for application-oriented talents, making the training of engineering technology and management professionals in colleges and universities face new opportunities and challenges. In the context of the transformation of application-oriented universities, we must constantly carry out reforms in teaching methods, teaching means and teaching contents, so as to adapt to the new management modes and methods in the field of engineering projects under the background of informatization. The teaching reform of engineering project management course is imperative.

The Formation of Reform Ideas

The Development of Engineering Project Management Discipline in China. Modern project management in China originated from the "planning method" popularized by professor hua luogeng in the 1960s. Professor hua luogeng introduced network planning technology and combined it with the guiding ideology of "overall consideration and comprehensive arrangement" in China to promote and apply it in key engineering projects and achieved good economic benefits. At that time, the task of project management was to emphasize the realization of quality, cost and schedule. In 1984, during the construction of the lubuge hydropower station project funded by the world bank in China, the Japanese construction enterprises used the project management method to manage the project effectively, and achieved very good results, which had a huge impact on the engineering field in China. In 1987, the state required construction units to adopt the project management construction method, and began to establish China's project manager certification system. In 1991, the ministry of construction put forward the comprehensive promotion of project management and project manager responsibility system, China's project management system has been greatly promoted. The establishment of PMRC, in particular, marks the beginning of the maturity of China's project management discipline system[2].

The Current Situation of Engineering Project Management Courses in Our School. The engineering project management course offered by our school is a professional compulsory course. It is a comprehensive and practical subject that students face after studying engineering laws and regulations, engineering measurement and valuation, engineering economics, engineering bidding and contract management, etc. It's usually taught in the first semester of senior year, Because of a rich theoretical foundation the students have so that they can be in the senior year followed by graduation practice in the flexible use of knowledge.

However, some problems are still found in the course teaching in recent years: The first is the problem of talent training program. Basically, we are revising the talent training program every year in terms of the connection between courses, class hours and credits, introduction of cutting-edge subject knowledge, etc. We all hope that the courses can be better used for the employment of students. However, as it is still in the transition period, there are often some unreasonable Settings such as class hours. For example, the engineering cost of 16 undergraduate students canceled the construction project progress control course, and the engineering project management course hours were only optimized to 32 class hours, how to let students master a lot of content in a limited time give us a difficult problem. The second is the teaching method of the course, engineering project management is a practical course, which requires students to learn the most basic methods of "three control, two management and one coordination", so as to manage actual engineering projects. But at present, most of our time is spent in teaching these theoretical knowledge, and students have few opportunities to practice with their hands, so they don't know what is the use of learning this course for practical work. For the practical training course of project management, just uses the guanglianda company's sand table simulation system to carry on the simple case plan. In the beginning, students can still be interested, just like playing a game, but this freshness only lasts for two classes. The main reason is that this kind of sand table simulation is limited to let students understand the process of project management, but it idealizes many problems that may occur in the project, and students often do not follow the set routines in the implementation process. And this kind of sand table simulation is not applicable to actual engineering projects at present.

Thoughts of Engineering Project Management Curriculum Reform. According to the new talent training plan of our school under the transformation trend of application-oriented university and the current development status of China's construction industry, the idea of engineering project management course reform is as follows: Through flexible and diverse teaching methods, students can be comprehensively improved in knowledge, ability and quality, cultivate students' sense of participation, competition and collaboration, and improve students' ability to propose, analyze and solve problems.

According to the professional talent training program, we should pay attention to the cultivation of students' comprehensive quality and innovative ability. We are an applied technology university rather than a research university, so students can learn enough theoretical knowledge, and focus on cultivating their practical ability. We should carefully study the curriculum system, optimize the proportion of repetitive courses, increase the proportion of practical courses, and introduce advanced and cutting-edge knowledge. At the same time, considering the employment needs of students, courses should be in line with the industry, the teaching content should be consistent with the qualification examination content of registered architect, cost engineer and supervision engineer, so as to provide convenience for students to take the examination after graduation.

Reform of Teaching Contents

The Teaching Content Should be Combined with the Industry. Engineering project management is a practical and comprehensive subject. Students need to have the ability to solve various practical engineering problems through the study of theoretical knowledge. The employment direction of students in our college is mainly cost consulting, construction project management, bidding and procurement, project supervision, etc. Therefore, in the process of teaching project management courses, it is necessary to timely understand the business scope and work characteristics of different industries in the process of project management. Take students into the enterprise in a timely

manner, supplemented by real cases of the industry to give students the opportunity to really learn and really do. This process will greatly increase the requirements for teachers, and this requires teachers to constantly participate in practice, constantly improve themselves, make full use of every opportunity for enterprise temporary training, enrich their practical ability.

The Teaching Content should be Combined with the Professional Qualification Examination. Project management is one of the compulsory subjects in the national qualification examination of registered architect, registered cost engineer and registered supervision engineer. Moreover, the teaching materials for the practice qualification examination are more targeted, with more theoretical and practical examples and case analysis in the book. Through the organic combination of the content of these textbooks and textbook theoretical knowledge, students' learning enthusiasm and initiative can be improved. Only when students have more specific learning objectives can they achieve twice the result with half the effort. Therefore, our school encourages teachers to improve their abilities, teachers who have obtained the certificate of practice qualification will be rewarded to some extent. Only when teachers keep learning and pay attention to the content related to the qualification examination and have a more real and profound experience, can they better combine it with the theory class and help everyone to grasp the key points and key issues.

Teaching Content should be Combined with Cutting-Edge Knowledge. With the continuous development of modern information technology, the engineering field is also undergoing earth-shaking changes. In order to fully implement the relevant spirit of the national "2016-2020 construction informatization development program" and "national medium and long-term talent development program (2010-2020)", we should introduce building information modeling technology[3] into classrooms as soon as possible, promote its practical teaching, and accelerate the innovation of talent training mode.

Since its establishment, our school has cooperated with a number of software companies, such as Glodon Company Limited, pinming Company and sanhao software technology co., LTD., in the construction of training rooms, hoping to improve the teaching quality of students' practice classes. For the project management course, the new talent training program sets up a centralized practice link at the end of the semester, and introduces various teaching software to carry out project plan planning, construction organization design, bidding planning, BIM5D comprehensive management, etc. Through the project management sand table simulation system[4], students can carry out simple project plan planning and execution deduction. Through the game experience project manager, financial manager, operation manager, production and procurement manager and other roles in the process of project management duties and business scope, deeply understand the connotation of project management. Through the practice of zebra dream dragon software and tea tasting progress planning software, students can make and optimize the progress plan of the unit project. on the basis of drawing, add artificial, material, machinery and other resources curve, combine the graphic information and cost data organically. Through learning BIM 3d site layout software, students can more vividly express the construction site layout plan, and have more intuitive experience of the site situation. Through BIM bidding planning training, simulation of bidding process and preparation of bidding documents, to help students master the engineering project bidding and contract management related knowledge. Through the BIM5D construction comprehensive management software, students can master the core knowledge of model import and integration, collision inspection, schedule correlation, list matching correlation, etc., and combine the dimensional data such as time and cost with traditional 3D, so as to achieve a higher level of connection with the construction site and greatly improve work efficiency[5].

Reform of Teaching Method

Adopt Project-Based Teaching Methods. Due to the strong comprehensive practicality of engineering project management courses, the traditional classroom teaching mode of students finishing homework after class in the past has a low degree of student participation, which is far from meeting the needs of university classes under the new situation. Under the tide of the applied curriculum reform, project management courses should also implement project teaching, systematize teaching tasks, work tasks and courses, and work process[6]. The teacher breaks the original chapter structure of the textbook, reorganizes the course content, introduces some real and concrete construction projects as teaching tasks, and leads the students to complete each project as the ultimate goal, in this process to find and solve problems, so as to achieve knowledge understanding and mastery.

During the implementation of the project, it should be noted that the teacher divides the students into groups according to the number of students in the class, which is 5 for each group. If there are too many students, the sense of participation will be reduced, while if there are too few students, the goal cannot be achieved. In each class, the teacher will assign tasks according to the requirements of the project. The students will study the objectives of the task, and then learn, analyze and discuss the knowledge through books and the Internet, so as to find the key steps to complete the task and learn new knowledge and skills. In this process, students are the main body, and in the process of students' independent learning, teachers answer questions. After the students' discussion, the teacher makes a summary and evaluation. This process transformed the students' passive listening to lectures into active research, which greatly improved their learning enthusiasm.

Adopt Modern Teaching Methods. Engineering project management involves a wide range of knowledge and a lot of content, and a lot of teaching content cannot be understood by students simply through blackboard writing or narration. Therefore, it is necessary to constantly innovate teaching methods, introduce modern moocs[7], micro classes and other ways, and play video, animation and other vivid materials through multimedia equipment to make students have more intuitive feelings. It saves most of the time for teachers to write on the blackboard and can provide more information for students. After class, teachers can also communicate with students through QQ, WeChat, email and other ways to answer questions more efficiently.

Our school encourages teachers to use blue ink cloud classes for supplementary teaching. Teachers establish their own classes in advance, and upload some relevant knowledge of the class to the cloud. Students can read and browse the content sent by teachers after adding the class number, and obtain certain experience value. Teachers can sign in the class through cloud class, saving the time of attendance; students can interact with teachers in class by selecting students, raising their hands, rushing to answer questions, group evaluation and other ways, so as to improve students' sense of participation and obtain experience value at the same time; teachers can also release voting questionnaires, tests, question-answering discussions, group tasks and other activities, and communicate with students in various ways, which strengthens the connection between teachers and students. At the end of the semester, the classroom participation of all students in the class can be derived from the cloud, and the students' usual grades can be finally obtained. Compared with the traditional methods in the past, both authenticity and efficiency have increased significantly.

Adopt Flexible and Diverse Examination Forms. Under the new situation, engineering project management courses should have flexible and diverse assessment methods. The final paper cannot fully explain students' performance in a semester. The purpose of teaching is to enable students to really learn, really do, master the real skills, can combine theory with practice, to solve practical problems. Examination paper examination is only one aspect, some knowledge points can not be reflected by the test questions, and even some courses can not carry out the final examination. Teachers can increase the proportion of process assessment in combination with practice, and talk about students' complete term performance.

Conclusion

Project management curriculum reform is a long - term continuous exploration process. How to improve the teaching effect of courses and ensure that students learn more knowledge and acquire more skills within the limited time of courses are the focus of our reform. We should proceed from the needs of society and students, start from the basic work, constantly summarize experience, and carry out the teaching reform to the end.

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