

Research on the Construction of Engineering Management Curriculum System and the Training Plan of Professional Talents in Colleges and Universities based on BIM Technology

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Abstract

In recent years, a series of teaching reforms and personnel training have been carried out around BIM Technology among colleges and universities. In the future project management talent training program, the requirement of BIM skills is an essential training content. Integrate the existing curriculum system, revise the existing curriculum syllabus, introduce BIM software operation hours into the corresponding curriculum teaching content, accelerate the construction of training bases inside and outside the school, and actively encourage and guide students to participate in the corresponding BIM competitions. According to the main goal of talent training at present, this paper makes an in-depth study on the construction of curriculum system and training program of engineering management major, hoping to improve the teaching efficiency of engineering management major, effectively integrate BIM Technology, realize the sustainable development of students in the future, promote the progress of talents, and improve students' understanding of theoretical knowledge of this major, Strengthen the combination of theory and practice, and improve the students' motivation and extracurricular practice ability.

Keywords

BIM Technology, engineering management, curriculum system, personnel training.

1. Introduction

At present, BIM Technology has developed rapidly under the promotion of government policies. In this context, the large-scale construction enterprises actively respond to the call of the government, and spontaneously apply BIM Technology in their own large-scale projects, in order to make the construction more efficient. At the same time, the overall level of information technology in China's construction industry is low and the information synergy is not strong, resulting in low profit margin of domestic construction industry output value and insufficient core competitiveness. The current situation of this industry is largely due to the lack of excellent BIM talents. At present, many domestic colleges and universities have begun to try to introduce BIM Technology into scientific research and teaching, but at this stage, there is no mature application of BIM Technology in the training program for undergraduates; there is no specific program for which professional courses BIM curriculum should include in foreign countries. For the current situation of BIM talent shortage, engineering management specialty should seize the opportunity to introduce BIM teaching into the classroom, improve the curriculum system construction and professional talent training program. Colleges and universities should deeply analyze the actual development trend of the current national industry and the actual demand for talents, and efficiently and rapidly transport BIM technical engineering management talents, which is also the main problem faced by colleges and universities.

2. BIM Technology

BIM (Building Information Modeling) is based on the relevant information data of construction projects, and uses three-dimensional digital technology to build the project data model. It has eight characteristics of information completeness, information relevance, information consistency, visibility, coordination, simulation, optimization and graphing.

3. BIM based Curriculum System of Engineering Management Major in Colleges and Universities

3.1. Basic Quality Courses

Public courses mainly include: Ideological and moral cultivation and legal basis, basic principles of Marxism, introduction to Mao Zedong Thought and theoretical system of socialism with Chinese characteristics, college foreign language, higher mathematics, linear algebra, probability theory and mathematical statistics, college physical education, college computer foundation, psychological quality training of college students, safety education, situation and policy, career planning, etc .

3.2. Professional Education Courses

Professional education course mainly includes three parts: professional basic course, professional core course and professional elective course. Professional basic courses mainly include building materials, engineering mechanics, management, engineering economics, engineering structure, construction engineering drawing, civil engineering construction technology, housing architecture, engineering measurement, operational research, etc.; professional core courses mainly include installation engineering cost, construction laws and regulations, construction engineering cost, engineering bidding and contract management, engineering project management, engineering evaluation, etc Major elective courses mainly include project investment and financing, introduction to construction supervision, real estate development and operation, project bidding and bidding, project network planning technology, introduction to BIM, BIM Technology and application, budget estimate experiment simulation (GTJ) of Glodon civil engineering, pricing GCCP), project management experiment (BIM5D, three-dimensional field layout, template scaffold, project schedule, etc.) .

In order to improve students' ability of applying BIM skills, we should combine the new courses with the embedded courses, and combine them with the practical course system. For example, BIM field layout module is embedded in civil engineering construction; BIM model is embedded in engineering bidding and contract management to prepare bidding documents and simulate bidding process and electronic bidding; BIM5D progress, quality, safety and other management modules are embedded in engineering project management for resource optimization management; GTJ measurement and GCCP pricing are embedded in engineering evaluation.

3.3. Practice Curriculum System

Practice curriculum system is divided into four parts: basic practice level, engineering cognition level, comprehensive practice level and innovative practice level. The basic practice level includes the practical training of computer basic skills; the engineering cognitive level includes the practical training of civil engineering drawing, computer-aided drawing, cognitive practice, engineering measurement and building materials. The comprehensive practice level includes the course design of civil engineering construction, the course design of construction engineering quota and budget, the course design of engineering cost, the course design of installation engineering cost, graduation practice and graduation design. The innovation practice level mainly includes the academic paper writing and so on. Practice teaching is an

important part of training application-oriented talents, so building BIM based practice curriculum is more practical, mainly reflected in the comprehensive practice level.

4. BIM based Training Scheme for Engineering Management Professionals in Colleges and Universities

4.1. Career Orientation and Jobs

Professional orientation: construction engineering consulting management enterprises, construction enterprises, construction industry management departments and relevant enterprises and institutions. Initial positions: BIM modeling engineer, BIM project management engineer, Engineering Data Engineer, assistant cost engineer. Development position: Construction Engineer, cost engineer and relevant technical management positions related to project management.

4.2. Training Objectives

Based on BIM, the engineering management major of colleges and universities is mainly for construction consulting management companies, construction enterprises, construction industry management departments and other relevant enterprises and institutions, to cultivate high-quality composite talents who master the necessary basic theories and professional knowledge of engineering management major, have the ability and professional skills of BIM Technology and Engineering management, and adapt to the development of modern construction industry .

4.3. Knowledge Requirements and Ability Requirements

① knowledge requirements. Master the professional knowledge of construction material application and detection, construction measurement, construction organization and project management, quality inspection, etc.; master the principle and method of construction engineering quota; master the preparation procedure and method of construction, decoration, installation engineering budget and settlement; master the theory and method of bill of quantities pricing; master the method of engineering cost computerization; be familiar with engineering bidding and bidding To be familiar with the basic methods of project cost control, to understand the basic knowledge of construction economy, to master the basic methods of construction statistics, to understand the common construction and economic laws and regulations related to the construction market, to understand the accounting methods of assets, liabilities, owner's equity, income and profit and loss of construction enterprises, the calculation methods of engineering, products and activity-based costing, and the preparation of financial statements To understand the basic knowledge and methods of financial management of construction enterprises. ② capability requirements. Be able to use computers to complete all kinds of word processing, table design, data processing, etc.; be able to combine with the construction and production process of construction projects, engage in engineering cost valuation and control, participate in engineering project management, complete engineering claims and engineering settlement, etc.; be able to use the basic principles of construction economy to analyze and solve general problems in engineering cost management; be able to work in engineering Work according to law in cost management; be able to skillfully use budget quota to prepare project budget; be able to skillfully use consumption quota to prepare BOQ quotation; be able to use computer to prepare budget and BOQ quotation; be able to skillfully complete all works of project bidding quotation; be able to skillfully handle all works of project claim; be able to prepare project settlement; be able to use financial meeting Knowledge of engineering cost analysis and dealing with economic problems of engineering cost.

5. Research on the Reform Direction of Engineering Management Major in Colleges and Universities based on BIM Technology

5.1. Construction of BIM Training Center

BIM training center is an in-school training place that integrates the internal teaching of BIM Technology, the training of teachers and employees of foreign universities, and provides external technical services. It is also an important base for training talents in short supply of BIM Technology.

5.2. Deepen School Enterprise Cooperation

School enterprise cooperation is the only way for the development of Engineering Management Specialty Based on BIM, and it is also an important way to realize the combination of production, learning and research, and to cultivate high-quality applied talents. And the engineering management specialty itself has a very strong operability, so it needs to enter the practice of enterprises to gain more practical experience. In order to establish in-depth cooperation between schools and enterprises, there are several aspects: first, to jointly formulate the training plan and the implementation plan of teaching reform; second, to participate in the construction of laboratories and experimental bases; third, to participate in the research of practice direction and the formulation of training plan; Fourth The University and the enterprise jointly establish a BIM industry university research cooperation platform, carry out technological innovation, product research and development, and subject research, and jointly strengthen the technical capabilities of both the University and the enterprise.

6. Conclusion

With the vigorous development of BIM Technology, the construction project management mode will have a revolutionary change. It is of great significance to study how to integrate BIM Technology into the talent training and curriculum system of engineering management specialty, determine the talent training objectives and programs, adjust the knowledge and ability requirements, formulate the curriculum system, and propose the direction of teaching reform for the reform and development of Engineering Management Specialty of Applied Undergraduate College. At the same time, more in-depth research should be carried out in BIM curriculum standards, curriculum resource construction and other aspects in order to cultivate engineering management graduates who meet the requirements of the modernization of the construction industry.

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