

Innovative strategies for the cultivation of engineering management talents in Colleges and Universities under the new engineering

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Abstract: with the proposal of a series of national strategies such as “made in China 2025” and “smart manufacturing in China”, the transformation and upgrading of the construction industry and manufacturing industry have been promoted, and the demand for engineering talents has increased year by year. “New engineering” has become the wind vane leading the reform of talent training mode for engineering management majors in Colleges and universities, urging colleges and universities to improve the professional curriculum system and cultivate “double qualified” teachers, so as to improve the quality of talent training for engineering management majors. Teachers majoring in engineering management in Colleges and universities should actively carry out interdisciplinary integrated teaching and link up the courses of civil engineering, information engineering and management; Comprehensively optimize practical teaching, flexibly design practical training projects, and improve students’ practical ability; Actively carry out information teaching, carry out BIM Technology and hybrid teaching, and comprehensively improve the teaching quality of professional courses; Comprehensively promote school enterprise cooperation, promote modern apprenticeship, carry forward the spirit of craftsman, and improve the teaching and education quality of engineering management.

Key words: new engineering; College engineering management major; Personnel training; Training strategy

The “new engineering” not only requires students to keep improving in their majors and courses, but also requires them to have the skills of interdisciplinary and interdisciplinary learning, emphasizing the practicality, intersection and comprehensiveness of disciplines, and promoting the close integration of new technology and traditional technology. As a traditional science and engineering major in Colleges and universities, engineering management should actively implement the concept of “new engineering”. On the one hand, it is necessary to actively develop an interdisciplinary, interdisciplinary and integrated curriculum system, promote the integration of multiple disciplines, achieve the teaching effect of $1 + 1 > 2$, and cultivate more compound engineering management talents. On the other hand, colleges and universities should integrate new technologies such as artificial intelligence, BIM Technology and virtual simulation into the teaching of engineering management, do a good job in the docking of job skills and professional courses, innovate teaching methods, stimulate students’ interest in learning, improve their information literacy and innovation ability, and lay a good foundation for students’ employment.

1. Interpretation of the connotation of “new engineering”

“New engineering” is the product of new economy and new industry. On the one hand, we should establish and promote a number of new engineering specialties, such as new engineering specialties with artificial intelligence, intelligent manufacturing, cloud computing, blockchain and robots as the core, and cultivate compound new engineering talents. On the other hand, we should actively promote the reform and innovation of major in China, create an interdisciplinary, interdisciplinary and comprehensive curriculum system, promote the convergence of industrial development and higher education, and further improve the quality of education in Colleges and universities.

Since February, 2017, the Ministry of education has continued to promote the construction of new engineering, issued the notice on carrying out research and practice of new engineering and the notice on recommending research and practice projects of new engineering, actively promoted the reform of China’s engineering education, and helped build a powerful country in higher education, so as to cope with a new round of scientific and technological revolution and industrial reform, support service innovation driven development”Made in China 2025” and a series of national strategies.

The major of engineering management is a composite discipline, including four modules of management, technology, law and economy, with the goal of cultivating talents in engineering construction management, real estate development, civil engineering construction, construction engineering supervision and engineering project management. Teachers of engineering management major in Colleges and universities should actively implement the concept of “new engineering”. On the one hand, they should actively promote the integration of various professional courses, carry out interdisciplinary teaching, integrate the teaching resources of professional courses, integrate new technologies such as artificial intelligence, big data and cloud computing into the teaching of professional courses, further promote the docking of professional courses and industry development trends, and cultivate compoundExcellent engineering management talents as the goal. On the other hand, college teachers should continue to improve their professional ability, obtain certificates of professional skills related to engineering management, be “double qualified” teachers, and constantly improve their personal practical teaching ability. At the same time, they should keep up with the pace of the times, constantly expand their horizons, grasp the development trend of the front end of the profession, and integrate typical engineering management cases of advanced management technology into teaching, Let students familiarize themselves with the post skills of Engineering Management in advance, deeply understand the connotation of discipline and specialty, so as to improve the teaching quality of professional courses, and cultivate more compound engineering management talents with craftsman spirit, hard-working spirit and innovative spirit for the country.

2. Analysis of the current situation of Engineering Management Teaching in Colleges and Universities

1. the talent training plan is not reasonable

Talent training program is a key factor affecting the quality of engineering management talents in Colleges and universities. However, the current talent training program in some colleges and universities does not match the talent demand of the industry, which affects the effective development of engineering management teaching and the improvement of students' professional ability. For example, some colleges and universities' talent training programs for engineering management major are formulated around the teaching work of the University, ignoring the talent needs of the construction industry, market economy development, engineering management and other industries. The goal of compound and craftsman engineering management talents is not clear, which affects the teaching direction of professional course teachers. In addition, some colleges and universities' talent training programs were not updated in time, did not keep up with the current market demand transformation trend, and ignored the adjustment of talent training programs in combination with the development of regional industrial layout, professional curriculum groups, vocational skill level certificates and enterprise tutors' suggestions.

2. the curriculum system is not perfect

The "new engineering" advocates the establishment of an interdisciplinary, interdisciplinary and comprehensive professional curriculum system, but the curriculum system of Engineering Management in many colleges and universities lacks interdisciplinary and interdisciplinary characteristics, resulting in insufficient matching between the teaching content and students' abilities and interests, and does not achieve the effect of expanding students' knowledge. In addition, affected by the objective conditions and environment of the school, although more practical courses have been set up, there is a gap between the practical cases that students are really exposed to in teaching and the actual professional situation in reality. Professional teachers attach importance to the guidance of theoretical knowledge, but ignore the guidance of communication skills and working methods required for their profession, and ignore the integration of professional soft power into professional post skills, which affects the connection between professional course teaching and post skills training, and is not conducive to the cultivation of students' post competence.

3. The practical teaching mode is relatively simple

The engineering management major is highly practical, and requires high practical abilities of students in architectural drawing, design, construction management and civil engineering management. However, at present, the quality of engineering management practice teaching in Colleges and universities is unsatisfactory. Although the integration of theory and practice training teaching has been promoted, the training project is separated from the job skills, and the strong communication skills and working ideas for dealing with related problems required by this major are difficult to be exercised in the training courses, affecting students' understanding and learning of engineering management job skills. In addition, colleges and universities neglect to employ enterprise engineering management personnel as part-time teachers, and lack of high-quality part-time teachers, which affects the connection of post skills and practical teaching, the promotion of modern apprenticeship and the cultivation of students' post practice ability, all of which have an invisible impact on the improvement of the training quality of engineering management professionals.

3. Talent training strategy of engineering management major in Colleges and Universities under the background of "new engineering"

1. build an interdisciplinary integrated curriculum system and innovate talent training programs

Interdisciplinary integration is a major feature of the construction of "new engineering". Colleges and universities should extend this feature to the teaching of engineering management major, build an interdisciplinary integration curriculum system, further optimize the core curriculum group, do a good job in the docking of professional course teaching, job skills and industry development, and further optimize the training scheme of engineering management talents. First of all, colleges and universities can take management, technology, law, economy and information technology as the core of the interdisciplinary and integrated curriculum system, adjust the curriculum group of engineering management major around this core, reasonably allocate theoretical and practical class hours, and clarify the connection of teaching contents of various professional courses, so that students can understand the construction of professional discipline system in the curriculum setting. Scientifically plan the interdisciplinary integration teaching program, and improve the training program of engineering management talents. For example, colleges and universities should do a good job in the connection between vocational skill level certificates and professional courses, cooperate with off campus vocational training institutions, integrate the contents of vocational skill level examinations related to engineering management into teaching, and encourage students to actively obtain relevant vocational skill level certificates, so as to further enhance their employment competitiveness. In addition, the school will continue to improve the elective courses such as BIM Technology, prefabricated architecture and virtual simulation training, so that students can timely understand the new technologies and concepts in the engineering management industry, and further improve the quality of engineering management personnel training.

2. cultivate "double qualified" teachers and set professional examples for students

First, colleges and universities should pay attention to the construction of teachers' team of engineering management specialty, organize teachers to go deep into construction enterprises and engineering management enterprises for temporary study, further improve teachers' practical ability, encourage them to actively transform to "double qualified" teachers, and increase the number of "double qualified" teachers

of Engineering Management Specialty in Colleges and universities. For example, colleges and universities can organize teachers to study in industrial and civil buildings, roads and bridges, and municipal engineering enterprises, participate in the design, on-site construction, and engineering project management, constantly enrich their practical management experience, encourage them to transform their temporary experience in enterprises into teaching cases and scientific research topics, and provide rich materials for the construction of interdisciplinary integration courses. At the same time, teachers of engineering management major in Colleges and universities should continue to improve their personal ethics and style of teaching, organize students to study together in the construction site, give play to the spirit of hard work, hard work and dedication, set a good professional example for students, implement the ideological and political concept of the course, so as to improve students' professional ethics. Second, the school should actively employ enterprise engineering management personnel as part-time teachers, build a "professional course teachers + enterprise mentors" engineering management talent training mode, integrate front-line post skills into professional courses teaching, promote the exchange of teachers and technicians in the school, and further optimize the "double qualified" teacher team structure. For example, the school can employ project cost, project supervision and architectural designers as part-time teachers to explain green building, green construction, prefabricated building design and the application cases of BIM Technology in architectural design and construction for teachers, answer questions and solve doubts for teachers on site, jointly develop integrated teaching materials, and comprehensively improve teachers' teaching research and scientific research ability.

3. Comprehensively promote the modern apprenticeship system and cultivate the craftsman spirit of students

Teachers of engineering management major in Colleges and universities should comprehensively promote the modern apprenticeship system, and invite enterprise mentors to participate in the on campus training teaching, which can not only expand the teaching content of the training course, but also facilitate students to get familiar with the post skills in advance. For example, when explaining the relevant knowledge of installation engineering, teachers can invite enterprise tutors to participate in the teaching, and the enterprise tutors are responsible for the practical operation demonstration, so that they can explain the installation standards and operation specifications of building water, heating and electricity for students, expand the content of teaching materials, and further stimulate students' interest in learning. First of all, the enterprise tutor can explain the design of water, heating and power lines, installation operation standards and operation processes in construction engineering for students, and conduct on-site demonstration for them. While operating, he can explain the relevant theoretical knowledge, focus on the operation difficulties, strengthen students' understanding of professional knowledge, further improve their practical operation ability, and cultivate students' hard-working. The professional ethics of excellence, conscientiousness and responsibility encourage them to inherit and carry forward the craftsman spirit. Secondly, we can appropriately increase the class hours of "second class" and carry out professional spirit theme education for students. For example, we can broadcast documentary videos such as "building a big country" to show the spirit of a new generation of building construction and project management personnel to stick to their posts, love their posts and work hard, be willing to contribute, be self reliant, work hard and innovate, and carry forward the spirit of craftsman, Improve students' professional ethics. Colleges and universities should comprehensively deepen the school enterprise cooperation mode, invite enterprise tutors to participate in teaching, teaching evaluation and other work, and let students follow enterprise tutors to learn professional skills and professional ethics, so as to improve the quality of engineering management personnel training.

4. Conclusion

Teachers majoring in engineering management in Colleges and universities should deeply interpret the concept of "new engineering", actively promote the teaching reform of professional courses, build an interdisciplinary, integrated and interdisciplinary curriculum system, actively improve the informatization curriculum system represented by BIM Technology, improve new concepts and technologies such as prefabricated buildings, green buildings and new energy, and strive to grow into "double qualified" teachers, Set a professional example for students. At the same time, teachers should continue to optimize the practice teaching mode, invite enterprise tutors to participate in in class experiments, in class training, centralized training and enterprise training teaching mode, promote the wisdom teaching mode, further stimulate students' enthusiasm for autonomous learning, carry forward the spirit of craftsman, improve students' professional ethics, and then improve the quality of talent training of engineering management major in Colleges and universities.

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