Core Course Construction of Engineering Management Major

Xiangjun Zhang[1,a,*] and Ziheng Di[2,b]

[1]Business Management Branch, Jilin Business and Technology College, Changchun, 130061, P.R.China

[2]Safety Engineering, Xiangtan University, Xiangtan, 411105, P.R.China

[a]dxd0303@163.com; [b]xiaodi19@163.com

Abstract: Facing the future is one of the training directions of China's outstanding engineer education and training program. In the construction of core courses of engineering management specialty, we should have strategic vision and forward-looking consciousness. We should not only adhere to the characteristics of engineering management specialty, but also grasp the development direction of Engineering Management Technology in the future. Tamping the basic theoretical knowledge of engineering management is the premise, and enlivening the practical teaching of engineering management is the way out. Especially in view of the development needs of Jilin Province, explore new ways to cultivate college students' engineering application ability and innovation consciousness.

Keywords: Engineering Management Major, Core Courses, Practical Teaching

1. Introduction

With the "Education and Training Plan for Excellent Engineers", Chinese universities have accelerated the reform of undergraduate training plan and teaching construction. "Plan of Excellence" advocates adherence to the training orientation of "facing industry, the world and the future". It is especially suitable for the growing construction technology to promote the growth of emerging market economy.

According to estimates, by 2020, the scale of China's new technology assembly construction market will exceed 2 trillion yuan, and by 2025 will reach 4.7 trillion yuan. Assembly building is expected to usher in leap-forward development. Faced with the future social challenges and the development of emerging market economy, engineering management teachers need to seriously consider: what is the development trend of future social engineering technology, what knowledge and abilities should engineering management professionals possess in the future, and how to construct and reform the core curriculum of engineering management profession? It is both an urgent task and a long-term strategy to cultivate a large number of diversified and innovative outstanding engineering management talents and provide intellectual and talent support for China's industrial development and international competition. The specific objectives are: by 2020, to explore and form a new construction mode of engineering management specialty, and actively adapt to new technologies, new industries and new economic development; By 2030, a world-class engineering education system with Chinese characteristics will be formed, which will strongly support national innovation and development; by 2050, a Chinese model leading the global engineering education will be formed, a powerful engineering education country will be built, a world engineering innovation center and talent highland will be established, and a solid foundation will be laid for the realization of the Chinese dream of great rejuvenation of the Chinese nation. 。

2. Discuss and Establish a New Development Model of Engineering Management Course

China's planning clearly puts forward seven key areas of development, including energy conservation and environmental protection, new information technology, biomedicine, new equipment technology, new energy, new natural resources and environmental protection and

  DOI: 10.25236/sser.2019.040

transportation. These areas require a large number of solutions for new technologies and products. This is a golden opportunity and challenge for Chinese engineers. According to the law of interaction between higher education and previous industrial revolutions in the world, new trends and requirements for future technological and industrial development are put forward. On the basis of summing up the experience of technical paradigm, scientific paradigm and engineering paradigm, this paper explores the establishment of a new model of core curriculum of Engineering management. Guided by coping with changes and shaping the future, and taking inheritance and innovation, cross and integration, collaboration and sharing as the main ways, the research and practice of new engineering management courses are carried out in depth.

3. Prospective Consciousness in the Course Construction of Engineering Management Major

Course construction is a key link in the teaching reform of undergraduate majors in modern universities. In order to cultivate project managers who can meet the future development needs, adapt to and lead the future direction of engineering technology development, the guiding ideology of the construction and reform of the core curriculum system of engineering management specialty is proposed.

In the construction of core courses of engineering management specialty, we should think strategically, not only adhere to the characteristics of engineering management specialty, but also reflect forward-looking. Tamping the basic theoretical knowledge of engineering management specialty is the premise, and invigorating the practical teaching with strong engineering quality is the way out. Especially, we should leave room to actively sort out the connotation of core courses of engineering management specialty, incorporate part of modern engineering technology into the professional curriculum education, and activate the curriculum system, leaving room for teachers to increase or decrease the teaching content according to the situation.

Strengthen the research on the demand of Engineering Science and technology talents for industrial development, do a good job of incremental optimization, stock adjustment, and actively plan the core curriculum construction of emerging engineering management. We will vigorously develop new technologies such as big data, cloud computing, Internet of Things applications, artificial intelligence, virtual reality and new industries such as intelligent manufacturing, integrated circuits and new materials, as well as new engineering management specialties and specialty clusters. Serve for industrial transformation and upgrading, to the high-end development of the value chain. Promote the cross-integration of existing management specialty and engineering construction, the cross-integration with other disciplines, the extension of applied science to engineering management specialty, and foster the formation of new cross-disciplinary specialty.

4. The Reform of the Core Courses of Engineering Management Major

(1) Renewal of the knowledge system of engineering management professionals

1. Adjustment of Core Courses of Engineering Management Major

The core curriculum of engineering management specialty should be adjusted into three parts: basic course of discipline, fine-tuning course, compulsory course of specialty and innovative course of specialty, practical course of specialty (see Table 1).

category	Course title	Remarks
Basic Subject Course	Principles of Management	Invariable Curriculum
	Applied Statistics	
	Microeconomics	
	Marketing Management	
	Basic accounting	

Specialized compulsory courses	Project Cost Management	Fine tuning course
	Introduction to BIM	
	Project Bidding and Contract Management	
Engineering Practice Course	VBSE Comprehensive Simulation Training	Innovative curriculum
	Innovation and Entrepreneurship Education Curriculum	

As can be seen from Table 1, the adjusted curriculum integrates the main knowledge points of engineering management specialty and moderately breaks away from the constraints of reference textbooks. Five courses of "Management Principles", "Applied Statistics", "Microeconomics", "Marketing" and "Basic Accounting" are boldly fixed to consolidate the theoretical basis for postgraduate students. Initially, a system of practical courses has been formed, including "Project Cost Management", "Project Bidding and Contract Management", "Introduction to BIM", VBSE Comprehensive Simulation Training and "Innovation and Entrepreneurship Education Course".

2. The construction of practical courses is the key

The basic courses and compulsory courses are relatively mature. The key points of their construction and reform are to sort out knowledge points, compress the "tedious" theoretical knowledge hours, multi-point assessment and interactive teaching. The engineering practice courses which emphasize the application and use of open teaching mode are forward-looking and time-varying. The construction and reform of the courses should focus on combining the high and new technology in the field of engineering management to stimulate students' production and creative potential.

Innovating engineering education methods and means, implementing the concept of student-centered, increasing students' choice space, facilitating students' cross-disciplinary and cross-school learning, enhancing teacher-student interaction, reforming teaching methods and assessment methods, and forming a learner-centered engineering education model. Promote the deep integration of information technology and education and teaching, build and popularize online open courses, make full use of virtual simulation and other technology innovation engineering practice teaching methods. We will improve the education system of "creativity-innovation-entrepreneurship" for new engineering management professionals, build a wide range of innovative entrepreneurship practice platforms, and strive to achieve that more than 50% of engineering management professionals participate in the "College Students' Innovative Entrepreneurship Training Plan" and an innovative entrepreneurship event. Build business incubation base and professional customer space, promote the close integration of industry, University and research and the transformation and application of scientific and technological achievements.

(1) Exploring the self-development and self-motivation mechanism of the new engineering management curriculum

Give full play to the autonomy of running a school and the initiative spirit at the grass-roots level, and enhance the sense of responsibility and mission. Make good use of the "new project management" experimental field, promote the comprehensive reform of colleges and universities, establish the personnel assessment and employment system and internal incentive mechanism that conform to the characteristics of Engineering education, and explore the mechanism of two-way communication between university teachers and professionals. Advantage universities, comprehensive universities and local universities of engineering management specialty should actively gather consensus inside and outside the university, take the initiative to act, innovate and

carry out diversified exploration according to their own characteristics.

(2) Creating New Ideas of Engineering Management Course

We should optimize the organizational model of collaborative education in schools and provide organizational guarantee for the training of new engineering management professionals through the establishment of a new interdisciplinary organization, which integrates departments, disciplines and specialties. We should pool the advantageous resources of industry departments, scientific research institutes and enterprises, improve the collaborative education mode of combining science and education, integrating production and learning, and school-enterprise cooperation, and build a shared collaborative education practice platform integrating education, training and research and development. Promote and implement the cooperative education project of industry-university cooperation, promote the reform of engineering education with the latest achievements of industrial and technological development, and cooperate with Guanglian Da Company in depth. The problems in teaching are analyzed as follows: Enterprises can help colleges and universities establish regional benchmarking image and promote the perfection and maturity of professional teaching system.

(3) Enhancing the Competitiveness of Engineering Education in Jilin Province

Understanding the frontier of domestic engineering education reform and development, researching the new trends and Strategies of National Engineering Education in developed regions, aiming at the future and leading Jilin Province, this paper puts forward the training program of new engineering management professionals.

We should adhere to the concept of development based on and serving local areas, and closely integrate the characteristics of real estate, road and bridge, and construction industries in Jilin Province and the whole northeast region. In recent years, Changchun City and the surrounding large and medium-sized cities are carrying out the transformation of urban traffic system. With a total investment of 22.3 billion yuan and a total length of 82.8 kilometers, "three vertical and two horizontal" expressway system engineering, a large number of engineering and technical personnel are needed. The core courses of engineering management specialty, Engineering Cost, Introduction to BIM Application and Engineering Quality Management, can make use of the theories, methods and means of civil engineering technology and modern management science. Provide technical design, management planning and consultation for relevant engineering construction units, and further promote the rapid and healthy development of road, bridge and construction industry.

Through a large number of social surveys, it is found that the quantity and quality of the social demand for engineering management students is gradually improving. Faced with the industry transformation, engineering construction enterprises urgently need skilled personnel who know not only the construction technology but also the operation of assembled building software, as well as the calculation and management of civil engineering. Students majoring in engineering management can obtain relevant professional qualifications, such as: BIM modelers, auditors of building systems, cost engineers, builders and other construction enterprises widely recognized professional certificates, professional employment export is guaranteed. Therefore, in the coming period of time, enterprises, especially small and medium-sized engineering enterprises in the province, will greatly increase the demand for engineering management positions. According to the employment situation of graduates from Jilin Business College since 2016, the number of graduates is close to 100, and the employment rate reaches 100%. At present, there is a great demand in our province. After adjusting the core curriculum, the students majoring in engineering management have a wide range of employment, and the degree of employment and professional fit has been further improved.

References

[1] Clewe O, Wicha S G, de Vogel C P. A model-informed preclinical approach for prediction of clinical pharmacodynamic interactions of anti-TB drug combinations[J]. J Antimicrob Chemother, 2017, 73(2):45-67.

[2] Li D, Xin S, Chen N, et al. Space-based information service in Internet Plus Era[J]. Science China(Information Sciences), 2017, 60(10):102-308.

[3] Ma X. Influence Research on the Industrial Transformation and Upgrading Based on Internet

Plus Strategy[J]. Journal of Computational & Theoretical Nanoscience, 2017, 14(9):4384-4390.
[4] Karn N K, Zhang H, Feng J. User-perceived quality aware adaptive streaming of 3D multi-view video plus depth over the internet[J]. Multimedia Tools & Applications, 2018, 77(11):1-19.
[5] Feng P, Yang W. Internet + Community Home Care: A New Model of Smart Home Care[J]. 2018:194-197.
[6] NING Xiao-Hui, NIE Fei, YANG Ying. Reform of Graduate Course of Analytical Chemistry Majors:Taking Electronic Technology Course as an Example[J]. University Chemistry, 2017, 32(5):56-98.
[7] Rosenbaum S. Now Welfare Reform, Of Course.[J]. Milbank Quarterly, 2018, 96(1):13-16.
[8] Aotian P. Reform and Practice of the Teaching Content System Based on the Management Course System of PBL.[J]. Eurasia Journal of Mathematics Science & Technology Education, 2017, 13(6):12-23.
[9] Xie F. Teaching Reform and Innovation Ability Training for Undergraduate in Closed-range Photogrammetry Course[J]. Journal of Geomatics, 2017, 42(1):119-122.
[10] Wang S, Zhang Q, Cai X. Multiple Practice Teaching Reform of Product Mapping Course[J]. Journal of Graphics, 2017, 38(3):453-457.