Exploration of Undergraduate Specialty Construction from the Perspective of Engineering Education Certification

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Keywords: Engineering Education Certification; Undergraduate Professional Construction; Personnel Training

Abstract. Based on the concept of engineering certification, the construction of undergraduate specialty is of great significance. Based on the top-level design scheme of talent training with "goal, idea, mode, system and characteristics", this paper systematically explores the professional construction approaches that universities generally pay attention to from the teaching mode and mechanism through the research of many major teaching practice reform projects. According to the circular mode of" exploring, perfecting, practicing, evaluating and popularizing application ", this paper promotes the professional construction.

1. Introduction

Nowadays, it is urgent to train a large numbers of innovative engineering science and technology talents, to support the development of new economy characterized by new technology, new business form, new industry and new mode, and to adjust the training system of engineering professionals for the needs of industrial change. The construction of undergraduate specialty based on engineering certification has strong practical significance.

As an effective way to achieve the goal of cultivating first-class undergraduate talents, the ability training of students is "whole process, full coverage, multi-level and multi-channel ". In view of the lag of the current talent training mode and educational concept, the failure to meet the needs of the development of new engineering courses, the lack of active professional reform, and the reform of professional construction remain in repair and repair, and the lack of progress; The curriculum system lacks innovation and cannot meet the needs of the national strategy. [1, 2] It adheres to the fundamental task of creating people by virtue, adheres to the concept of engineering education, deepens the" three integration "model of applied talents training, takes first-class teachers, first-class courses, first-class platforms and first-class achievements construction as the core, and takes engineering education professional certification as the starting point, further creates professional characteristics, promotes connotation, trains students' professional ability to study and solve complex engineering problems, makes students have family feelings and professional spirit, creates students' consciousness of lifelong learning and sustainable development ability of effective communication and management, and promotes students' all-round development.[3]

2. Renews the Idea, Constructs the Multi-Platform Fusion Training System

2.1 Adhere to the "three-standard" Concept of Co-Development Training to Create a Multi-Agent Resource Integration Platform

Long-term practice and exploration have gradually formed the concept of “education-based, society-based, students-based” coordinated development of talent training. Taking “Training Students by Virtue” as the foundation, setting up the correct "three views" to integrate thought leading education into curriculum teaching, reforming curriculum and practice system to solve the

problem of disconnection between talent training and social development, taking students as the main body and solving the problem of insufficient students' and practical ability. On the basis of the " three-standard" concept, driven by national strategy and industrial demand, guided by discipline development and high-level talent gathering, and based on the cultivation of innovative talents in the service industry, a multi-subject and multi-form cooperation platform, including industry associations and local enterprises, is built to train innovative talents urgently needed by the state and industry in an innovative way, and a first-class talent training model is constructed to promote the construction of first-class specialties.[4]

2.2 Training of Information Professionals Based on Local Economic Needs

With the development of information control field in China, Liaoning Province, as the vanguard of the revitalization of the old industrial base in Northeast China, increases the training of applied talents to meet the needs of information control professionals in the construction industry and economic construction of Liaoning Province. Professional personnel training programs should constantly adapt to the actual needs of the market and strive to improve students' ability to solve complex problems, strengthen curriculum integration, and actively promote the organic and deep integration of basic curriculum information, curriculum objectives, teaching contents, teaching methods, assessment methods, and teaching objectives.

2.3 A market-oriented, Multi-module Flexible Teaching System for Large Platforms

Facing the development and market demand in the field of information control in our country, six modules of mathematics and natural science, general education, humanities, engineering foundation, professional foundation and professional curriculum education are constructed according to the three levels of "consciousness, organization and operation ". At the same time, four practical platforms are set up: basic skills practice platform, professional curriculum training platform, comprehensive practical training platform, engineering practice training platform, management, incentive, guarantee and evaluation mechanism to cultivate students' ability to solve complex engineering problems.

3 Reform the System of Teaching Operation and Level the Content of Practice

3.1 Reform of Teaching Methods Through Multi-Channel Information Technology

Teaching content based on social needs, step by step, to achieve the goal of "teaching according to their aptitude" goal. Through the multi-mixed teaching mode of "flipping classroom" and the multi-interactive learning environment of "WeChat & Mobile Network ", the students are guided to make full use of the three basic ways of" autonomous learning, cooperative learning and inquiry learning "to realize interesting learning. At the same time, deepen the reform of examination contents and forms, take cultivating students' comprehensive quality, guiding students' active learning and personality development as the guiding ideology, and carry out "comprehensive examination" with the goal of cultivating creative thinking ability and innovation ability. In addition to the traditional closed-book examination, according to the nature of the course, open-book, semi-open-book, defense, design, practical operation, case analysis, reading report, literature review and paper can be used in different stages of the course.[5]

3.2 "Learning, Practice, Competition, Creation and Production" Practice Teaching System

According to the "basic comprehensive engineering practice" three-level ability training system, based on curriculum teaching, project training as the grasp, subject competition as a supplement, school and enterprise practice as a breakthrough, according to the three-level ability training system set a clear goal, each module from single to comprehensive, from shallow to deep, each module rely on each other, coordination, reflects the direction of information professional development. [6, 7]

3.3 Development of Personalized Training System and Establishment of Self-cultivation Model of "Learning from the Application of Self-cultivation

In the expansion of personalized training system, training research and development, innovative creative entrepreneurial ability. A systematic organization and implementation of innovative entrepreneurship training programs and competitions at all levels, the establishment of the Internet, ACM、 Mobile Development, Robotics and other cross-professional practice teams, encourage high-level teachers to participate in scientific research practice training, promote the national, municipal and other experimental teaching demonstration centers and national, provincial and ministerial level scientific research laboratories to fully open to students, students "independent positioning, independent choice, active learning" to form a multi-in-one ," self-learning "personality development. The pattern of cultivation.

4. Establishment of Management Mechanisms Adapted to the Sustainable Development of Teaching

4.1 Construction of Three-Level Monitoring Closed-Loop Teaching Quality Assurance System

This major takes the national social and educational development needs, the industry development, the school orientation and the development goal, the student development as the starting point, formulates the training goal-oriented teaching quality monitoring system. To achieve the training goal, graduation requirements and continuous improvement of the teaching process, through the off-campus cycle to continuously improve the training goal, through the internal cycle to continuously improve the teaching links, through the teaching cycle mainly continue to improve the teaching process.

4.2 Improve Teaching Management Mechanism Based on OBE, Multi-Level and Full-Range

Adhere to the teaching reform, around the cultivation of students' ability to improve and improve the management system of teaching work, the document covers the management of professional construction, teaching quality management, practical teaching management and teaching operation, etc. Aiming at the different levels of student training, teacher evaluation, supervision and supervision, the system of combining teaching with learning, encouragement and restraint has been formed.

5. Conclusions

The exploration and practice of undergraduate specialty construction from the perspective of engineering education certification, taking the students of the School of Information and Control Engineering of Shenyang Construction University as the research object and practicing for more than five years, has formed a relatively stable practical teaching system suitable for the training of professional applied talents, which has played a good role in the process of professional talent training.

Acknowledgments

This work was financially supported by Building Control and Energy-saving Optimization National Experimental Teaching Demonstration Center Open Project Fund(BCES2019KF09) , Education, Teaching and Research Project of China Association of Construction Education (2019148). Project of Ideological and Political Science in Shenyang Construction University 2020(kcsz202015).

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