

Discussion on Training Mode of Civil Engineering (Outstanding Engineer)

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Abstract. Based on the requirements of "thick foundation, wide caliber, strong ability, and high quality" put forward by the Ministry of Education, through the construction of civil engineering majors in Jiangxi University of Science and Technology, the improvement of the undergraduate talents training program for civil engineering majors was discussed in this paper. It summarizes the present situation of personnel training system, the goal, significances and reform measures of outstanding engineers in civil engineering.

1. Introduction

The Ministry of Education's Education Training Plan for Outstanding Engineers is a major reform project to implement the National Outline for Medium-and Long-term Education Reform and Development Plans(2010-2020) and the National Outline for Medium-and Long-term Talent Development Plan(2010-2020). It is also a major measure to promote China's transition from a major engineering education country to a powerful engineering education country. The plan aims to cultivate a large number of high-quality engineering and technical talents with strong innovation capabilities and meet the needs of economic and social development, and serve the country's strategy of taking a new path of industrialization and development and building an innovative country and a talented country ^[1].

At present, in order to meet the higher requirements for higher education set by the new situation, Jiangxi Science and Technology Normal University has further deepened educational and teaching reforms, comprehensively promoted the achievements of applied talents construction, and established a system for the training of undergraduate talents that gives more prominence to the orientation and characteristics of our school. Cultivate and develop competitive high quality applied talents. The Civil Engineering Department of the School of Architecture and Engineering has been awarded the "Excellent Talent Training Program" experimental class project by Jiangxi Science and Technology Normal University. 2012] (No. 34) The standards and training programs for outstanding engineers in civil engineering have been formulated, and the reform of the curriculum teaching system and practical teaching system has been further promoted, and the construction of existing engineering practice teaching bases has been strengthened, and according to the industry's requirements for professional personnel training, With the well-known engineering design and engineering construction units in the province, a joint training unit was established.

2. Objectives and Significance of the Professional Implementation of the "Outstanding Engineer Training Program"

2.1 Overall objective

The overall goal of the comprehensive reform of the civil engineering profession is to meet the different requirements of civil engineering for civil engineering professionals and the existing problems in the training of civil engineering professionals, and to align the industry standards with the general standards for civil engineering professionals. Establish the standards for the training of outstanding engineers in applied civil engineering in our school^[2]. Cultivate innovative ability, adapt to the development needs of the land, wood and construction industry, adapt to the construction of the Poyang Lake Ecological Economic Zone in Jiangxi Province, and apply applied engineering talents for scientific and technological innovation, serving the country and Jiangxi Province's socio-economic development^[3].

And The goals of the "Excellent Engineer Training Program" implemented by the civil engineering major of Jiangxi Normal University of Science and Technology are to: update the education concept, face the first line of civil engineering, and cultivate high-quality civil engineers who meet the needs of the company; In view of the different requirements of civil engineering for civil engineering professionals and the existing problems in the training of civil engineering professionals, the standards for the industry and the general standards for civil engineering professionals are established, and the standards for the training of outstanding engineers in applied civil engineering in our school are established. Explore the establishment of a relatively stable teaching content and curriculum system, management system and evaluation methods that coincide with the "Excellent Engineer Training Plan"; Build a high-level "double division" faculty with strong practical ability combined with schools and enterprises, build a relatively complete on-campus civil engineering experiment training center, and build a group of off-campus practical training bases that provide good support for civil engineering "Excellent Engineer Training Program".

2.2 Sub-objectives

(1) The goal of teacher construction: To build a teaching and research team of outstanding engineers in civil engineering who specialize in "combination, two-way employment, and double high teachers".

(2) The construction goal of practice teaching base: Constructing "two bases, one center": training practice training base for outstanding engineers in civil engineering; Training base for outstanding engineers in civil engineering; Industry skills appraisal center.

(3) Curriculum and Teaching Resource Base Construction Objectives: To develop two to three school-based courses with Jiangxi civil engineering characteristics; Construct a digital, three-dimensional teaching resource base. (4) Evaluation criteria for training civil engineering professionals: curriculum standards; Quality evaluation standards for practical training; Skills standards; Comprehensive assessment and evaluation criteria for students.

3. Reform Measures of the Professional Implementation of the "Outstanding Engineer Training Program"

3.1 Reform of the professional curriculum system

In accordance with the competency standards and training plans of the "Excellent Engineer Education Training Plan" in civil engineering, the Jiangxi Science and Technology Normal University has strengthened its research with enterprises, formulated and improved the curriculum of the "Outstanding Engineer Education Training Plan" course, and refined the training standards into knowledge and competency outlines. Restructure the curriculum system and implement the knowledge ability outline into the specific curriculum and teaching links. The key areas of improvement are as follows: (1) Further integration of the curriculum and reorganization of the

curriculum system. In accordance with the characteristics of civil engineering integration and innovation, vigorously promote the reform and innovation of teaching methods. (2) Strengthen practical teaching and enterprise learning. Combine engineering practice, further improve the practice teaching system. Its purpose is to cultivate students' ability to use the knowledge learned to think and operate independently through practice. (3) Experimental teaching. The existing experimental training room of the School of Architecture and Engineering of Jiangxi Normal University of Science and Technology is 640 square meters. It has civil engineering materials, engineering measurement, soil mechanics, HVAC engineering, mechanics laboratory, innovation laboratory and an engineering CAD center. The total value of existing experimental equipment is about 3 million yuan, and the experimental output rate reaches 100 %.

3.2 Design of the "3+1" Talent Cultivation Model Based on the Deep Participation of Construction Enterprises

This professional comprehensive reform pilot mainly focuses on the depth of enterprise participation in the personnel training process to carry out. Civil engineering "excellent engineer" adopts the "3 +1" model, that is, the school learns for 3 years, the company learns for 6 months, and the school designs for 6 months. Combining the practical problems in the life cycle of civil engineering projects, the basic training of civil engineers was obtained, so that students could meet the requirements of the technical capabilities of civil engineers and be able to flexibly use the basic theoretical knowledge of the profession. With the ability to solve engineering problems, communication ability and team cooperation ability, become a strong sense of innovation, welcomed by the company's outstanding engineering talents. Forming a theory-practice-theory-repractice knowledge ability training system.

3.3 Curriculum development

Build and improve the school enterprise cooperation course. Senior engineers and technicians in enterprises are invited to give lectures or co-lectures on professional courses. The main content is the core knowledge of the profession and the difficult problems in practice, forming a complete curriculum system and a stable team of enterprise teachers, so that the course construction and professional practice are closely linked. We should improve students' ability to relate theory to practice and analyze problem solving.

3.4 Teacher development

The School of Architecture and Engineering of our school has established a high-level teaching staff that combines full-time teachers with part-time teachers. Full-time teachers are mainly school teachers, with a high teaching level and "double division" quality, and are active in the first line of engineering planning and construction; Non-full-time teachers implement the appointment system, hire high-level experts to teach students to the society and the industry, and guide students in the cultivation of innovative ability and engineering ability. The college currently has 32 full-time teachers, including 1 professor, 8 associate professors, and 15 lecturers. The proportion of teachers with state certified qualifications for practice reached more than 70 percent of the teachers who have long participated in engineering design, construction, supervision and consultation. In order to establish an engineering teaching team that understands the development of the construction industry and meets the training of engineering talents, the Jiangxi Science and Technology Normal University intends to adopt a variety of methods to build teachers. The School of Architecture and Engineering has formed a faculty with a combination of specialization, strong engineering practice ability, and full of vitality.

3.5 Student Competence Development

(1) Student interest development

The biggest motivation for students to study and research is interest. In a sense, the size of interest determines the level of achievement. Fostering students' interest in learning and research is an important part of the "Excellent Engineer Education Training Program". By reforming the

classroom teaching methods, offering advanced knowledge innovation lectures, basic experiments, comprehensive experiments, design experiments, and innovative experimental programs for college students, we will promote the cultivation of innovative spirit and practical ability, and promote the cultivation of the humanistic quality of engineering talents.

(2) The Organic Integration of Innovation Ability Cultivation and Classroom Teaching

Through engineering training and teaching, it promotes the combination of theory and practice, and realizes the transformation from knowledge to ability, and cultivates students 'innovative thinking and innovative ability. Jiangxi Science and Technology Normal University set up an innovation training room, mainly through the practical operation of the production of models, simulation experiments, thinking into reality, promote the improvement of innovation capabilities. The goal of engineering training is to "learn craft knowledge, improve hands-on ability, enhance engineering practice ability, improve comprehensive quality, and cultivate innovation spirit and innovation ability."

4. Summary

Based on the reform of civil engineering teaching in Jiangxi University of science and technology, this paper gives some thoughts and practice on the training of outstanding engineers in civil engineering, and has achieved good results through the research and practice in recent years. It has greatly improved students 'ability to innovate, and through research and exploration on the reform of the training of civil engineering talents, we hope to form a relatively mature training plan for civil engineering professionals, create distinctive professional characteristics, and effectively improve the quality of personnel training. Meet the requirements of social development for civil engineering applied talents.

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