

Research on Training Mode of Compound Innovative Talents in Civil Engineering Specialty Based on Social Needs

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Abstract. With the rapid development of China's higher education and social economy, the community's demand for civil engineering talents has been continuously improved. The competition for talents has changed from quantitative to qualitative. It is imperative to build a new knowledge structure for civil engineering talents. In addition to the employment pressure brought about by the continuous expansion of enrollment, the civil engineering major focuses on the theory and but not on practice. It is difficult for the cultivated students to adapt to the actual needs of society and to keep up with the development speed of modern civil engineering. The reason for this is that it is very important that the talent training in universities is out of line with actual needs. Therefore, with the changes in the requirements of the civil engineering talents in the market, it is extremely urgent for civil engineering majors in contemporary colleges and universities to further develop the training model of composite talents for civil engineering based on their social needs, the development and trends of civil engineering, and their actual conditions. This article analyzes the current status and problems of civil engineering talents training in China's colleges and universities, and explores the training model for composite innovative talents in civil engineering.

Introduction

As the civil engineering major has the characteristics of multiple disciplines, wide professionalism, comprehensiveness, and high humanistic qualities, especially after China's entry into the WTO, the development of China's construction industry ushered in unprecedented opportunities, but also faced with severe challenges, facing civil engineering. Technical talent also put forward higher requirements. In the face of fierce competition in the construction talent market, colleges and universities should adapt to the transformation of civil engineering to "large civil engineering" as soon as possible in order to cultivate talents in the building, give full play to the advantages of disciplines, and cultivate and develop new types of composite innovative talents that meet the development needs of the 21st century and competitive and innovative talents who meet the requirements of modern engineering management. According to the training program for civil engineering management professionals in China, the training goal is to cultivate the basic knowledge of management, economy and law related to the needs of modernization, civil engineering technology and engineering management, obtain basic training for engineers, and have certain practical ability and innovation. Ability of senior engineering management personnel. In the past, our civil engineering talents had a relatively simple knowledge structure. Many people were only experts in a certain technical field. However, such knowledge structure and practice proved to be incapable of adapting to the needs of modern engineering management. Therefore, this paper analyzes the current status and problems of the training of civil engineering majors in China's colleges and universities, and explores the training model for composite innovative talents in civil engineering.

The Characteristics of Complex Innovative Talents

Compound innovative talents are multi-functional talents. They are characterized by versatility and ability to show their talents in many fields. Compound talents include knowledge compounding, capability compounding, and thinking compounding. The major features of today's society are

cross-disciplinary, knowledge fusion, and technology integration. This feature determines that everyone should improve their overall quality. Individuals must not only expand their knowledge but also constantly adjust their mentality, change their own thinking, and become a "bright thinking person."

The complex talents required for online news, first of all, should be a combination of natural science and social science in the knowledge structure. Secondly, compound talents are also reflected in the integration of various disciplines in the humanities and social sciences. Thirdly, compound talents are also reflected in the organic combination of theory and practice.

Compound innovative talents refer to the innovative talents who have developed basic theory and extensive knowledge through a certain education model and have mastered the theory, knowledge, and skills of two or more disciplines. To cultivate complex innovative talents, colleges and universities must follow the laws of external relations of education, take the needs of society as the reference, adjust the school's professional settings, and professional training objectives, training specifications, so that personnel training can better meet the needs of economic and social development; It is necessary to follow the laws of internal relations in education, use professional training goals and training specifications as benchmarks, and adjust professional training programs and training approaches so that the various elements in the personnel training model can be more coordinated and the quality of personnel training and personnel training objectives can be improved. .

Current Situation and Problems of Civil Engineering Talent Training Mode

The talent cultivation model reflects the training objectives and specifications of professionals. Only by constantly exploring diversified personnel training models that meet the needs of modern society can we cultivate high-quality talents that are favored by society. The training objectives for civil engineering professionals are: Grasping the basic theory and basic knowledge of civil engineering disciplines, training civil engineers in basic qualities, designing, constructing, supervising and civil engineering management in civil engineering, and initially possessing civil engineering projects Planning and scientific research capabilities. With the adjustment of the country's professional catalogs and the changes in the market's requirements for civil engineering talents, the training mode for college civil engineering personnel needs to be reformed.

Overemphasizing the Training of basic Theoretical Knowledge of Civil Engineering, ignoring the Overall Training of Educators. At present, the training objectives of civil engineering professionals in China's colleges and universities are generally over-specialized. Usually, undergraduates target their training to the full development of morality, intelligence, physical and aesthetic development. The professional basic knowledge is comprehensive and comprehensive. It is broad and has strong hands-on and practical application ability. When setting the target of talent cultivation, colleges and universities are habitually focused on human application ability, resulting in a simple and unilateral submission of professional courses to social occupational needs. Due to the utilitarian nature of the society, students pay more and more attention to the knowledge and skills required by individuals in their short-term careers, and ignore the medium-term and long-term career development plans. Therefore, the undergraduates cultivated in different degrees have the following deficiencies: their adaptability is weak, their career planning ability is weak, innovation and entrepreneurship awareness is weak, either.

Examinations Focus on Theoretical Tests, Neglecting Skills and Other Aspects of Assessment. At present, professional course examinations in institutions of higher education cannot objectively and impartially reflect the true level of students. The reason is that there are many forms of one-time closed-loop theoretical examinations. The examination papers are basically the subject of teachers, and the "separation of teaching and examination" has not been truly implemented. More than fill in the blank, short answer, noun explanation, judgment questions, multiple choices, etc. can be more memory-like examinations, it is easy to cause students to memorize, do not seek to understand; However, there are almost no questions on the skill tests, operational drills, and practical application skills of students' application of knowledge flexibility and comprehensive

abilities, such as comprehensive thinking questions, analytical essay questions, proof questions, applied questions, and material analysis questions. The current examination method is difficult for students to master professional knowledge, especially the students' ability to innovate, which seriously hampers the development of professional comprehensive and innovative talents.

The Separation of science Education and Humanities Education in the Design of Curriculum System has Weakened the Humanistic Consciousness. In order to meet the needs of local economic construction in the new situation, civil engineering majors have paid great attention to the basic theory and basic knowledge of civil engineering disciplines and pay attention to the training of civil engineers, but they have neglected non-professional courses and general knowledge. It has led to undue neglect of humanistic education, a narrow knowledge structure of students, and a weak sense of students' humanities. The phrase "total soil and wood" precisely reflects the lack of humanistic knowledge. Therefore, although students can quickly become professional and technical personnel after graduation, it is difficult to achieve harmony and unity in doing work and doing things.

Insufficiency in Scientific Research and Innovation. Scientific and technological innovation activities are an important carrier and an effective way for all-round quality education, a natural and necessary extension of classroom teaching, and an important organic component of university student education. At present, many universities and colleges have established undergraduates' scientific and technological innovation management institutions, and have gradually increased funding and material support to effectively carry out undergraduate science and technology innovation activities. However, the market concept of student science and technology innovation is still insufficient. There are two aspects: Firstly, there is a lack of careful guidance and assistance from teachers in science and technology innovation projects. Secondly, science and technology innovation activities rely more on students' hobbies and interests, lacking of market surveys and actual needs analysis. These problems have hindered and restricted the development of student science and technology innovation activities, resulting in small-scale and inefficient utilization of technological innovation.

Conduct Civil Engineering Teaching Reform and Cultivate Complex Creative Talents

For building companies, they now face the need for change in domestic innovation and entrepreneurship. The integration of civil engineering and the increase of comprehensive engineering projects, especially the changes in economic systems and employment mechanisms, have made the overall quality, professional caliber, and adaptability become the most basic requirements for talents in society. Teaching plans must adapt to this change. Therefore, we must reform the personnel training model and the corresponding curriculum system, take the initiative to adapt to the requirements of domestic innovation and entrepreneurship training, and put this guiding ideology into the new teaching plan.

Transform Teaching Concepts, Grasp Discipline Characteristics, and Promote Professional Development. Civil engineering major is a wide-caliber professional across civil engineering, management and economics. The construction of civil engineering disciplines should straighten out the cross-cutting relationship between architecture science, economic science and management science with management science as the core, handle the breadth and depth of the intersection of three science and technology, optimize the knowledge structure system and curriculum system, and establish large-scale civil engineering new concept of education, broaden professional caliber. From simply imparting professional knowledge to transforming students' ability to discover problems, gaining knowledge, and the ability to innovate and innovate, and increase awareness of quality, anxieties, and competition. It makes the original professional training objectives, training requirements, main courses and practice have taken place in fundamental changes, to adapt to the new training objectives and teaching requirements, we should make the new teaching plan, build the new talents cultivation system. However, it is not only rigidly adhered to the rigor of the theory, but also gives some emphasis to the concept of engineering practice. It also implements general education with emphasis on both theory and practice.

Improve Curriculum System and Improve Course Content. Civil engineering majors should systematically reform the traditional curriculum system based on the needs of cultivating innovative and innovative talents, and establish a teaching plan centering on the cultivation of students' innovative abilities, giving full play to the enthusiasm, initiative, and creativity of students in the learning process, improving students' self-acquisition knowledge and ability to use flexibly. First of all, in conjunction with the school's own situation, we constantly optimize the curriculum system. The curriculum system should be set up in accordance with the needs of the community and cultivate professional talents in civil engineering that meet and adapt to market demands. In the curriculum system, it is necessary to pay attention to the cultivation of students' overall quality and comprehensive ability, and more importantly, ideologically attach great importance to the comprehensive training of students' "vocational outlook", "scientific view" and "professional view", and set up corresponding course modules to set them up. It is closely integrated into the practical teaching process and truly nurtures the innovative talents with noble personality and pioneering spirit that the society needs.

School-Enterprise Collaborative Innovation Practice Teaching System. According to the "competence structure and comprehensive quality" requirements for the cultivation of compound innovative talents, students' hands-on, practical abilities, and multi-level and diversified needs are considered, and the innovation resources and talents of large enterprises such as Wuhan University and China Railway No. 11 Bureau are brought together. "Innovation, information, technology" of innovative elements, to achieve in-depth cooperation, the establishment of school-enterprise collaborative innovation in the practical teaching system and the corresponding practice platform, there are the following three platform.

Basic experimental platform

Relying on the platform to cultivate students' hands-on abilities and innovative thinking, three key points are highlighted: Not only the importance of confirmatory experiments, but also the importance of comprehensive and design experiments; Both strengthening the construction of basic laboratories and strengthening the construction of off-campus practice bases; Teaching laboratory construction, but also strengthen the provincial and ministerial level research base.

Professional training platform

By taking the off-campus practice base and the National Engineering Practice Education Center as the mainstay, supplemented by specialized laboratories in the school, the experienced engineers and technicians are recruited as practical instructors to guide students in understanding internships, production internships, graduation design, and engineering training. Integrate engineering practice to develop students' ability to analyze and solve problems.

Comprehensive Innovation Platform

It consists of three parts: Science and technology or social activities, including college students' extracurricular science and technology activities, innovation training program projects, social practice activities, etc.; competition activities or projects, including mathematical modeling competitions, structural design competitions, etc.; innovative works or entrepreneurial achievements, including Academic papers, technology products, patents, works of art, etc.

Summary

Categories of civil engineering innovative talents training mode is a systems engineering, and based on the professional training target, teaching program, curriculum system, course content, practice teaching and teaching staff construction of how to cultivate innovative talents in civil engineering categories was discussed in this paper. It is proposed that the training model of civil engineering complex type innovative talents should be based on the general framework of the professional guidance committee of the Ministry of Education, combining the needs of the professional development of the social development, reforming the connotation of the profession, and clarifying the training objectives of the composite engineering talents of the civil engineering. Teaching, plans, curriculum systems, curriculum content, textbook construction, and sources of teachers should be reformed accordingly so as to cultivate a multi-talented talent of civil engineering.

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