



Exploration and Practice of Innovation and Entrepreneurship Education for the Safety Engineering Major

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Abstract: This paper discusses the reform and practice of Innovation and entrepreneurship education for safety engineering majors under the background of new engineering, considering the demand

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for safety engineering talents under the new situation and the requirements of the construction of new engineering disciplines. Taking the reform of Innovation and entrepreneurship education of safety engineering majors in our university in recent years as an example, through the construction of high-quality teaching staff for Innovation and entrepreneurship education, we built a "school, enterprise, research institution" for the integration of the innovation and entrepreneurship practice training platform, form a " comprehensive , three-dimensional , diversified" innovation entrepreneurship education system, innovation entrepreneurship education into the university training scheme, in the end, summarized the practical application results of analysis for nearly two years as well.

Keywords: New engineering, Safety engineering, Innovation and entrepreneurship education

1 Introduction

The arrival of the new industrial revolution has influenced the concept, mode, and content of engineering talent training^[1-2]. The connotation of new engineering discipline has been continuously expanded, a new discipline generated by intermingling different disciplines and a new specialty transformed, upgraded, and integrated by the existing traditional engineering disciplines^[3-4]. Safety discipline is an emerging, comprehensive, and interdisciplinary discipline of science, engineering, humanities, law, management, medicine, and other disciplines^[5]. Many colleges and universities offer safety engineering majors, characteristic of extensive comprehensive crossing, including military, chemical, petroleum, mining, civil engineering, transportation, energy, environment, economy, etc. With the cross-integration of disciplines, the training mode of "one specialty and multiple capabilities" for safety engineering majors has been unable to meet the needs of innovative talents for new engineering majors. Currently, nearly 100 universities in China have set up security engineering undergraduate programs, among which 11 universities have the right to grant security technology and engineering doctoral degrees, and 34 universities have the right to grant master degrees (excluding research institutes). Regarding regional distribution, more universities offer safety engineering majors in developed regions, which need and attach more importance to safety engineering talents. Safety Engineering at Xi 'an University of Science and Technology was formerly known as a mine ventilation and undergraduate safety major, then it was adjusted to be a safety engineering major, and in 2003, it was rated as a famous major in Shaanxi province, one of the first national characteristic professional construction points, and the safety professional teaching team was awarded the national teaching and the innovative team of the Ministry of Education. It has always been an essential base for training safety science and engineering talents, scientific research, and social services in China. Based on the Innovation and

entrepreneurship education of the students majoring in safety engineering in our school in recent years, the author explores the Innovation and entrepreneurship education model of safety engineering from four aspects, including the construction of an innovation and entrepreneurship education mentor team, entrepreneurship practice training platform, talent training mechanism and improvement of the training program.

2 Safety engineering innovation and entrepreneurship education system

2.1 The construction of high-quality teaching staff for Innovation and entrepreneurship education

A team of experienced teachers in safety engineering and successful entrepreneurs outside the school has been established. According to the characteristics of the development direction of the safety discipline of our school: science and control of coal fire, Coal and gas safety mining, safety emergency management, mine equipment safety and rescue, mine ventilation safety, and other five characteristic research directions, formed a full-time, high-level teacher guidance team. The basis of scientific research projects above the provincial or ministerial levels guides students, and they have organized the implementation of innovation and entrepreneurship course teaching and training programs, curriculum teaching, and other relevant teaching links. In addition, excellent entrepreneurs such as the general managers of 12 successful start-ups, such as Shaanxi Bo'an science and Technology Limited liability company were employed as part-time mentors. These mentors have strong management quality and practical guidance ability and participate in innovation and entrepreneurship classroom teaching and practical teaching links.

2.2 Construction of "School, enterprise, scientific research institution" as one of the innovation and entrepreneurship practice platform

To ensure that students majoring in safety engineering can participate in systematic training of Innovation and entrepreneurship, a training platform for innovation and entrepreneurship practice integrating "school, enterprise and scientific research institution" for safety engineering was established. The majors there are the national experimental area, west mine mining applied talents training mode innovation, national mine rescue and disaster prevention and control of the ministry of education key laboratory (Xi'an) research center, west of coal mine safety engineering research center of the ministry of education, Shaanxi coal mine disaster prevention, control of "13115" engineering research center and seven provincial-level innovation platform. At present, 8 enterprises, including Shanxi Jianrui fire protection Limited liability company, have jointly established the off-campus practice training base. By deepening the cooperation of the school-enterprise alliance, comprehensive and multi-channel employment channels for students were formed, a platform for

communication and communication with enterprises was set up, and a platform for the entrepreneurial practice of students was built. These innovation and entrepreneurship practice platforms are used to systematically carry out education activities such as professional knowledge learning, practice exercise, innovation experiment, entrepreneurship training, and entrepreneurship project incubation to cultivate students' Innovation and entrepreneurship abilities, help them understand the requirements of enterprises on talents, determine their career direction and enhance their competitiveness.

2.3 Establishment of "diversified" innovative and entrepreneurial talents training mechanism

The major has established a safety technology research center jointly with Shanxi coal chemical group and Xi'an branch of the coal science general institutes and established three international joint research centers on thermal power disaster prevention and control with Huizhou Saililong new materials Limited liability companies. The major directly carried out innovation and entrepreneurship education and student training through the connection between the major and the enterprise.

Every year, from the beginning of the freshman year, a program named "tutorial system" with an associate professor or above guides students in research, innovation experiment, entrepreneurship training, and employment. A series of lectures, such as safety lecture hall and wonderful youth lecture, will be held every month, and "professor topic day" will be held every week to enhance the communication between students and professors, expand students' vision, stimulate students' curiosity about scientific knowledge, and create a good atmosphere for Innovation and entrepreneurship. Select suitable projects based on students' scientific research interests, introduce corresponding extracurricular science and technology innovation activity groups, and carry out Innovation and entrepreneurship training.

In order to ensure the effective development of innovation and entrepreneurship activities, the safety engineering major has developed relevant systems and programs and formed a diversified training mechanism for innovative talents. The "innovation and entrepreneurship" cultivation project is specially set up in the construction fund of "first-class majors" in Shaanxi province, which involves a wide range of aspects. Students can cultivate their innovative spirit through project application, implementation process, and key technology research. Founded the student-led western safety association, annual safety design competition, safety knowledge contest, microfilm series, fire control safety knowledge contest, and other kinds of competitions; all students of safety engineering have participated in, On-campus full-time advisor, off-campus part-time advisors have guided, and excellent works have been selected to participate in the school, Shaanxi province, and national competition.

2.4 Adjust the curriculum system and integrate Innovation and entrepreneurship education into the talent training program

In order to integrate Innovation and entrepreneurship education into the whole talent training system, after adjustment, the safety engineering major currently has three education platforms: general education, professional education innovation, and entrepreneurship education. General education and professional education are completed within the class, and Innovation and entrepreneurship education are completed outside the class. General education consists of six modules, including humanities, social science, natural science foundation, sports, foreign language, computer, information technology, and economic management; professional education consists of three modules, such as engineering technology base, professional basis major, There are five teaching links: classroom teaching, experiment teaching, practice, comprehensive design, and special ability training. Each module and link is composed of several courses. Innovation and entrepreneurship education consists of four modules: social practice investigation, science and technology innovation experiment, entrepreneurship training, and project incubation. It includes participation in social practice investigation, science and technology activities, and innovation competition activities to ensure that innovation and entrepreneurship education runs through the whole four-year education process of college students.

3 Practice effect

In the past two years, we have followed the teaching reform thought of "combining teaching and scientific research organically and strengthening the cultivation of innovation and entrepreneurship practice ability", and formed distinct characteristics in talent training. That is: based on the western region, highlight the characteristics of coal mines, and cultivate high-quality innovative and entrepreneurial talents for the social and economic development of the industry and the region. Taking various activities such as extracurricular science and technology works competitions, entrepreneurship competitions, Internet + entrepreneurship college students' innovation experiments, and training programs as an opportunity to lead students to carry out various activities to promote their ability to improve. Students in science and technology competitions a total of 95 times above the provincial level and 228 times above the university level; The subjects won 57 person-times at the provincial level and 176 person-times at the university level. One of the works won the second prize in the National "Challenge Cup" College Students Extracurricular Academic Science and Technology Works Competition and the bronze prize in the progressive innovation award; won 1 first prize and 6 second and third prizes in the National College Safety Engineering Practice and Innovation Works Competitions; Second prize and one excellence award respectively in the BRICS Creators Competition; won 1 special prize and the third prize in

Shaanxi Province "Challenge Cup" Extracurricular Academic Science and Technology Works Competition for college students; 2 provincial silver prizes in The Third "Internet +" College Students' Innovation and Entrepreneurship Competition; One business incubation project was settled in the incubator, and eight undergraduate innovation training programs were completed. The employment rate of students majoring in safety engineering in the recent two years has exceeded 95%.

4 Conclusion

Along with our country's economy, widening the increasingly complex production system, and constantly introducing new and high technology, involved in the production environment, equipment, process, and operation risk factors become more complex, hidden, hazard risk is more serious. Due to the relatively poor science and technology foundation of production safety, the basic theory of production safety and the research on major vital technologies need to be deepened, and the innovation ability needs to be improved. In this case, the requirements for safety engineering professionals are getting higher and higher, and the market for innovative high-level talents specializing in safety engineering professionals is getting larger and larger. Safety engineering major promotes teaching through scientific research, seeks support by service, improves talent cultivation mode, deepens education and teaching reform, and focuses on cultivating innovative and entrepreneurial senior safety talents.

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