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Research on the Integration of Professional Education of Construction Engineering Technology and Innovation and Entrepreneurship Education

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Abstract: With the rapid development of society and economic growth, the construction engineering industry has become an important industry. However, the traditional professional education of construction engineering technology attaches more importance to theoretical knowledge explanation of construction engineering and lacks practical education and cultivation of innovative and entrepreneurial consciousness, which is not quite in line with the needs of industrial development. Therefore, the integration and development of professional education in construction engineering technology and innovation and entrepreneurship education have attracted much attention. This paper discusses and analyzes relevant theories and concepts, effectiveness and problems of integration practice, ways and methods to promote integration development, policies and measures, respectively. Through various ways and methods, the deep integration of professional education in construction engineering technology and innovation and entrepreneurship education is strengthened to promote industrial innovation and development.

Keywords: professional education in construction engineering technology; innovation and entrepreneurship education; integration and development

1. Introduction

Construction engineering is a highly practical discipline, while innovation and entrepreneurship are the spirits advocated by the current society. The integration of innovation and entrepreneurship education and construction engineering technology education helps students realize the conversion of theoretical knowledge and practical skills, master the basic knowledge in practice, master the application methods of professional technology, and quickly get on the job after graduation to meet the requirements of enterprise positions. In recent years, more and more colleges and universities have started to try to integrate construction engineering technology professional education and innovation and entrepreneurship education, and have achieved certain results. The purpose of this paper is to explore the theories and concepts related to the integration of professional education in construction engineering technology and innovation and entrepreneurship education, the connotation and characteristics of integration, the effectiveness and problems of integration practice, the ways and methods, policies and measures to promote the development of integration and promote industrial innovation and development.

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2. Theoretical framework of integration of

professional education of construction engineering technology and innovation and entrepreneurship education

2.1 Relevant theories and concepts of integration

Construction engineering technology major is an important discipline to train professional skill talents for enterprises, aiming to improve students' professional skill level and engineering construction management level. Innovative and entrepreneurial education pays more attention to practical skills training, realizes rapid transformation from campus environment to enterprise working environment, and students are able to master necessary vocational skills through learning innovative and entrepreneurial education. The integration of professional education in construction engineering technology and innovation and entrepreneurship education aims to combine the practice in professional education in construction engineering technology and innovative thinking in innovation and entrepreneurship education, and also to promote the innovation and development of the construction engineering industry (Meng, 2018). The process of integration requires students to master the theoretical knowledge and knowledge application methods of construction engineering professions in order to better guide practice.

Among them, the theories and concepts related to the integration of professional education in construction engineering technology and innovation and entrepreneurship education mainly include the following aspects.

Firstly, with the practical and applied nature of professional education in construction engineering technology, students should master the way of conversion between theoretical knowledge and practical skills in the learning process, and learn to apply basic knowledge to solve problems. In contrast, innovation and entrepreneurship education emphasizes students' active exploration and experimentation in the process of innovation and entrepreneurship and cultivates students' creativity and innovation ability.

Secondly, in the practical process of integrating the two, attention needs to be paid to the combination of engineering management and innovative and entrepreneurial thinking. In the practice of construction engineering, innovative and entrepreneurial thinking needs to be considered to solve practical problems through innovative ways, while engineering management also needs to be strengthened to ensure the quality and safety of the project.

Finally, it is also necessary to focus on the reform and innovation of education and teaching. Professional education of construction engineering technology needs to combine with the characteristics of innovation and entrepreneurship education to improve students' innovation and entrepreneurship ability through innovative teaching modes and teaching methods; innovation and entrepreneurship education also needs to combine with the practical and applied nature of professional education of construction engineering technology to improve students' engineering management and application ability through practical teaching and engineering management practice (Chen, 2017).

2.2 Connotation and characteristics of integration

The connotation of integration includes strengthening innovative and entrepreneurial thinking in construction engineering practice and integrating innovation and entrepreneurship into engineering practice; in innovation and entrepreneurship education, students' practical skill level and application innovation ability are emphasized, and innovation and entrepreneurship are combined with engineering practice. This integration not only enables students to apply theoretical knowledge and practical skills in engineering practice to solve the problems existing in engineering but also cultivates creativity and innovation ability in the process of innovation and entrepreneurship, which makes students continuously improve their skill level and practical application ability(Ma, 2019).

The integration is characterized by the emphasis on practicality and application, the practical experience and skills application methods that students learn from it through engineering case study and analysis,

and the practical nature of innovation and entrepreneurship education, which enables students to have innovative thinking through practical teaching and innovation and entrepreneurship practice and to continuously innovate and research in their daily work(Wang, 2020). This integration strengthens the practical nature of professional education in construction engineering technology and the practical nature of innovation and entrepreneurship education, which can help students to improve their practical skills.

The characteristics of integration also include focusing on reform and innovation in education and teaching, adopting more innovative teaching modes, enriching teaching materials, and improving the quality of education and teaching. This integration requires cooperation between teachers of construction engineering technology professional education and innovation and entrepreneurship education to jointly develop teaching plans and teaching methods to provide students with more comprehensive and effective education and teaching services(Yu, 2020).

3. mode and strategy of integration practice

3.1 Mode and strategy

The combination of the architectural engineering technology profession and entrepreneurship and innovation education requires corresponding integration modes and strategies for different educational contents and goals, and the following are common modes and strategies.

(1) Curriculum integration mode, which integrates the curriculum contents of both and establishes some related courses, aiming at organically combining the knowledge and skills of both education, so that students can master practical and innovative entrepreneurial ability in the learning process.

(2) Project integration mode, in the practical teaching of construction professional skills, some projects with innovative and practical values are selected to combine the features and contents of the two education, so that students can master the practical ability and innovative entrepreneurship in the actual projects.

(3) Teacher integration mode, establishing a team of teachers with a background in construction engineering technology and innovation and entrepreneurship so that teachers in both education fields can work together, discuss and exchange problems in teaching, share teaching methods and improve teaching quality and effect.

(4) Student practice activity integration mode, by organizing students to participate in various practice activities, such as innovation and entrepreneurship competition, construction engineering practice, etc., the content and objectives of the two kinds of education are combined, so that students can learn and master practical skills and innovation and entrepreneurship in practice.

(5) Discipline integration mode, establishing cross-research of related disciplines, carrying out interdisciplinary teaching and research, promoting exchanges and cooperation between the two educational fields, and improving education teaching and research.

In the process of integration, corresponding strategies need to be adopted, such as establishing corresponding education and teaching management system, improving curriculum systems, building practice bases, and improving teachers' teaching levels, in order to achieve the integration of professional education in the construction engineering technology and innovation and entrepreneurship education (Lei, 2020).

3.2 Effectiveness and problems of integration practice

The integration practice of professional education in construction engineering technology and innovation and entrepreneurship education has been implemented in some universities and has achieved some remarkable results. Specifically, the integration practice can enhance students' practical ability and innovation and entrepreneurship, improve their comprehensive quality and competitiveness; it can promote the innovation and development of the construction engineering industry and contribute to social and economic development.

However, there are some problems in the process of practice, such as the difficulty of integration, which needs to solve the problem of integration of different teaching methods and concepts of construction engineering technology professional education and innovation and entrepreneurship education; insufficient practice bases, as construction engineering technology professional education needs the support of practice links, while innovation and entrepreneurship education needs the support of entrepreneurship practice, so the lack of practice bases will limit the development of integration practice; teacher quality Inadequate, professional education in construction engineering technology needs professional technical guidance, while innovation and entrepreneurship education need teachers with innovation and entrepreneurship experience, and the quality of these teachers is often not easy to obtain(Yang et al., 2020).

Therefore, these problems need to be solved in the practice process, such as strengthening the training and support of integration teachers, increasing the investment and construction of practice bases, and improving the teaching level and quality of teachers, in order to further promote the integration of professional education in construction engineering technology and innovation and entrepreneurship education.

4. Ways to promote the integration of professional education in construction engineering technology and innovation and entrepreneurship education

4.1 Ways and methods to promote integration development

Various ways and methods need to be adopted, and the following are some common methods: strengthen the training and introduction of teachers, improve their teaching level and professional quality, and provide support and guarantee for the integration practice. Strengthen the construction and development of practice bases, establish more practice teaching platforms, and provide opportunities for students to realize a good employment environment and exercise their practical skills for successful job search. Promote cross-disciplinary and interdisciplinary research, strengthen the cross-disciplinary cooperation between professional education in construction engineering technology and innovation and entrepreneurship education, and promote the improvement of education, teaching and scientific research. Actively carry out innovative and entrepreneurial activities, such as innovative and entrepreneurial competition and entrepreneurial practice, to cultivate students' innovative and entrepreneurial spirit. The school should cooperate with enterprises to integrate enterprise job requirements and job duties into students' practical training education, enabling enterprises to directly select suitable talents and dispense with long-term training. Establish incentive mechanisms to encourage teachers and students to participate in integration practice, such as setting up scholarships for integration practice and selecting outstanding teachers and students for integration practice, to stimulate teachers and students to be active in innovative thinking ability and innovative research. Promote excellent cases, display enterprise practice cases as practice content, give reference to students' skill application, and help other universities and students better understand and participate in integration practice. Strengthen information sharing and cooperation, build information sharing platforms and cooperation platforms, promote communication and cooperation among colleges and universities, and promote the integration and development of professional education in construction engineering technology and innovation and entrepreneurship education. Strengthen social support and encourage all walks of life to actively participate in integration practice. Enterprises can set up practical training bases to supply students to participate in practice activities, and the government provides policy and financial support, etc., so as to jointly promote the integrated development of professional education in construction engineering technology and innovation and entrepreneurship education. Establish the mechanism of integration of industry and education,

promote the deep integration of professional education in construction engineering technology and innovation and entrepreneurship education with industry, and provide sufficient talent reserve for the development of the construction industry. Strengthen international exchange and cooperation, carry out international cooperation projects, introduce foreign advanced education concepts and modes of education in construction engineering technology and innovation and entrepreneurship education, and promote the improvement of education and teaching level and quality (Liang, 2020).

Through the implementation of the above ways and methods, we can better promote the integration and development of professional education in construction engineering technology and innovation and entrepreneurship education, and cultivate more talents with practical ability, innovative thinking ability and job responsibilities for colleges and universities. At the same time, it can also provide useful experience and reference for promoting the reform and development of higher education in China.

4.2 Policies and measures to promote integration development

In order to promote the integrated development of professional education in construction engineering technology and innovation and entrepreneurship education, the support of policies and measures is needed. Some common policies and measures: the education department should pay attention to innovation and entrepreneurship education, understand its positive role in improving students' practical skills and cultivating innovative thinking ability, support the integrated development of professional education in construction engineering technology and innovation and entrepreneurship education, and encourage colleges and universities to innovate and explore in curriculum setting, teaching methods, practical teaching and so on. The government needs to provide a guarantee for the development of innovation and entrepreneurship education, encourage cooperation between enterprises and colleges and universities, establish bases for practical training activities, and provide students with training opportunities for practical skills and entrepreneurship rehearsal opportunities. The government needs to encourage innovation and entrepreneurship education and introduce corresponding preferential policies, such as lower tax rates and financial subsidies, to provide solid backing for students' innovation and entrepreneurship. Cultivate the spirit and ability of innovation and entrepreneurship. The government can strengthen cooperation with enterprises and prompt schools to establish cooperation with enterprises to provide students with opportunities for skills practice and a platform for the application of practical skills and ensure that the content of the practice training fits with the content of enterprise jobs. Provide talent support for industrial development. Schools can develop corresponding integration practice plans and teaching programs, incorporate integration education into the school's education and teaching system and develop corresponding evaluation indicators and assessment mechanisms to ensure the quality and effectiveness of integration practice. Schools need to motivate students to actively and enthusiastically participate in innovative and entrepreneurial activities, provide relevant entrepreneurial services and support, such as entrepreneurial guidance, guaranteed loans for business start-ups, and business start-up funds, etc., to provide sufficient financial support and encourage students to engage in innovative and entrepreneurial activities. The university should cooperate with enterprises to provide opportunities for students' onboarding and employment during the internship stage, combine students' practical activities and innovation and entrepreneurship practices with the needs of enterprises, improve education, teaching and research, and provide talent support for industrial development.

Through the support of the above policies and measures, we can better promote the integration and development of professional education in construction engineering technology and innovation and entrepreneurship education, improve students'

innovative thinking ability, enhance the level of ware practice skills, and provide talent support and guarantee for the innovation and development of construction engineering industry.

5. Conclusion

The integration and development of professional education in construction engineering technology and innovation and entrepreneurship education can improve students' practical ability and innovation and entrepreneurship spirit, and cultivate more high-quality talents. At the same time, the effectiveness and problems of integration practice need to be constantly summarized and explored, assessment and supervision should be strengthened, and the existing problems should be found and solved in time. In order to promote integration development, joint efforts and support from the government, universities and society are needed to strengthen the deep integration of professional education in construction engineering technology and innovation and entrepreneurship education through various ways and methods, such as teacher training and introduction, cross-disciplinary and interdisciplinary research, practice base construction and development, and encouraging students to participate in innovation and entrepreneurship practice, so as to promote industrial innovation and development.

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Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

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