A Study on the Innovation and Entrepreneurship Ability of Engineering Vocational College Students under the Ecological Niche Theory

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Abstract: The ecological niche theory provides a theoretical framework and a new perspective for cultivating the innovation and entrepreneurship ability of engineering vocational college students. In response to the current situation of cultivating the innovation and entrepreneurship ability of engineering vocational college students, this article provides path choices from four aspects: optimizing the professional structure of teachers, innovating the teaching paradigm of vocational colleges, cultivating students' entrepreneurial awareness, and enhancing collaborative development ability. The aim is to improve the innovation and entrepreneurship ability of engineering vocational college students, cultivate more innovation and entrepreneurship talents for the country, further serve local economic and social development, and contribute to the realization of strategic decisions such as driving development of innovation and building an innovative society for the country.

Keywords: Niche theory; Engineering students; Vocational colleges; Innovation and entrepreneurship

1. Overview of Niche Theory

The term "niche" originates from ecology and was first proposed by American scholar Johnson Grinnell . The ecological niche theory is an important theory in the field of ecological research, which mainly emphasizes the symbiosis, competition, mimicry and other interactions between species in the ecosystem. These interactions will affect the physical, chemical, and biological space, status, and role of biological populations in the ecosystem. Therefore, it attempts to define the "ecological niche" for vocational engineering students who receive innovation and entrepreneurship education. In the new era the innovation and entrepreneurship education in vocational colleges is increasingly valued. Exploring the relationship and role among the position, resources, and functions that vocational engineering students occupy in the ecosystem has become particularly important . Introducing the theory of ecological niche and leveraging the professional advantages and characteristics of vocational colleges can better promote the development of innovation and entrepreneurship education in vocational colleges. This is of great practical significance for improving the comprehensive literacy of vocational engineering students as well as the educational effect of innovation and entrepreneurship.

2. The Integration of Ecological Niche Theory and Innovation and Entrepreneurship Education in Higher Vocational Education

The fit between niche theory and innovation and entrepreneurship education in vocational colleges is mainly reflected in the following two aspects: firstly, innovation and entrepreneurship education in vocational colleges has typical characteristics of a complete ecosystem. It needs to be closely related to multiple departments such as academic management and student affairs within the school, as well as external systems such as government, society, and enterprises. At present, local vocational colleges are basically able to carry out a variety of innovation and entrepreneurship activities, including building a teaching system for innovation and entrepreneurship related courses, establishing entrepreneurship colleges and collaborative spaces, and exploring effective paths for innovation and entrepreneurship education; The second, it is appropriate to apply niche theory to analyze the innovation and entrepreneurship education in higher vocational colleges. The talents cultivated by vocational colleges with professional characteristics and innovative entrepreneurial spirit are gradually becoming the core force of social production development and people's lives. In the ecosystem of innovation and entrepreneurship education in vocational colleges, the resources and influence of vocational colleges themselves are interdependent with other functions of the vocational education system, which will have an active role in the cultivation of high-tech skilled talents. With the continuous expansion of the ecological niche, the expansion of the ecological niche of engineering vocational colleges will ultimately be achieved, and their own high-quality development will be realized.

3.The Value Connotation of Cultivating Students with Innovative and Entrepreneurial Abilities

In recent years, China has developed rapidly in fields such as science and technology. In order to achieve iterative development of technology and compete for leading positions in the industry, enterprises have an increasingly urgent demand for high-tech skilled talents. The competition in the talent market and the pressure of employment are also increasing. The professional settings of vocational colleges have characteristics such as locality, industry specificity, and practicality, especially emphasizing the accumulation of technical skills and literacy in production practice, and focusing on the cultivation of high-tech composite application talents in design, manufacturing and innovation development in related technical fields. While cultivating students to contribute to the development of local industries, vocational colleges should actively cater to the new trend of innovation and entrepreneurship. They should not only attach importance to the construction of curriculum systems, teaching paradigms, and classroom evaluation research, but also integrate various extracurricular training base resources and high-quality cooperative enterprises to ensure that students continuously improve their practical skills and technical application literacy, and explore distinctive channels and methods for cultivating innovative and entrepreneurial talents.

4. The Current Situation of Innovation and Entrepreneurship Education in Engineering Vocational Colleges

4.1 Unreasonable structure of course faculty

In the innovation and entrepreneurship education of engineering majors in vocational colleges, teachers play an important role. The current number of full-time teachers for innovation and entrepreneurship courses in vocational colleges is still relatively small, and their entrepreneurial experience and practical abilities are relatively insufficient . The matching degree between part-time teachers and the requirements of innovation and entrepreneurship education is not enough, and the updating of teaching methods and concepts is lagging behind. Although part-time teachers can realize the cross-cutting nature of education and teaching to a certain extent, the time they can devote to the teaching of innovation and entrepreneurship education is limited, which makes the effectiveness of innovation and entrepreneurship education cannot be fully guaranteed.

4.2 Lack of systematic curriculum teaching

The current innovation and entrepreneurship education curriculum generally has more theoretical teaching than practical teaching, and there is no effective connection with the curriculum in the field of professional knowledge. There is no scientific "ecological positioning" curriculum teaching, and problems such as fragmentation of the curriculum system still exist. The systematic and forward-looking teaching of innovation and entrepreneurship courses is insufficient, The courses lack the teaching orientation of staggered competition and reasonable development based on their own historical traditions and specialties, and the relevance of course teaching is not strong. Therefore, it is difficult to combine various courses organically. The lack of diversified teaching means and teaching evaluation results may lead vocational college students majoring in engineering to have a superficial understanding of the content of innovation and entrepreneurship courses.

4.3 Students' entrepreneurial awareness needs to be improved

Engineering vocational college students are easily influenced by traditional family values and generally choose traditional jobs upon graduation. Under the traditional education model, students mainly acquire knowledge through listening and other relatively single methods, and their thinking and innovation abilities are easily limited. Their comprehensive expression of knowledge, ability, and professional technical expertise is not enough. There are not many technological innovation achievements formed in hands-on practice and experiments, and vocational college students participate in innovation and entrepreneurship projects and achieve rich results. The innovation and entrepreneurship literacy of engineering vocational college students has not been significantly improved.

4.4 Collaborative development capability needs to be improved

Most vocational colleges have established bases to serve college students in entrepreneurship. Some vocational colleges have set up innovation and entrepreneurship colleges to undertake the platform function of college students in implementing entrepreneurial activities. However, they have not fully utilized the resource coordination and exchange cooperation role of entrepreneurship education platforms, nor have they effectively coordinated teaching, research, management and other institutions to provide rich entrepreneurial resources. There are many participants, such as the Academic Affairs Office, Student Affairs Office, Employment Office, Entrepreneurship College, and secondary colleges, and the division of labor is not high. Improving the collaborative development system of innovation and entrepreneurship education requires more educational resources to achieve collaborative development.

5. The Path Selection of Innovation and Entrepreneurship Education in Engineering Vocational Colleges

5.1 Optimize the professional structure of teachers

From the perspective of ecological niche theory, vocational college engineering teachers and ordinary part-time teachers represent different ecological niches. Although their respective expertise and abilities are different, they can provide better support and guidance for students and enrich the ecosystem of vocational education. Vocational colleges should provide policy support such as professional title evaluation, workload recognition, and other aspects to encourage engineering majors' professional teachers to teach basic courses of innovation and entrepreneurship education. Vocational colleges can regularly arrange innovation and entrepreneurship teaching teachers to participate in enterprise production management practice, and widely participate in the construction of innovation and entrepreneurship courses and enterprise practice teaching. This way, engineering teachers can more easily find their own positioning when teaching innovation and entrepreneurship courses, avoid ecological niche overlap and compression. Engineering teachers can not only closely combine professional and industry development to tell basic knowledge such as entrepreneurial opportunity exploration and successful entrepreneurial stories, but also impart the latest production requirements and unresolved problems in the industry. This not only promotes the diversified and sustainable development of the "dual teacher" teaching team, but also achieves the integration of innovation and entrepreneurship education with the majors of engineering vocational college students.

5.2 Innovative teaching paradigm in higher vocational education

Under the background of digital education, the informatization development of innovation and entrepreneurship education is an important direction for the innovative teaching paradigm of higher vocational education. From the perspective of niche theory, in order to facilitate the smooth niche shift of some individuals of the same species, it is necessary for innovation and entrepreneurship education to introduce teachers from different fields and majors, to draw on new technologies such as big data and cloud computing to carry out innovation and entrepreneurship teaching methods, to integrate engineering knowledge with innovation and entrepreneurship disciplines, to develop digital resources, and to focus on cultivating students' creativity and critical thinking during the teaching process. In teaching, higher

vocational engineering students are encouraged to make use of the design and manufacturing course platform to carry out interdisciplinary learning, and to achieve "learning by doing" in practical training. Integrating the objectives of innovation and entrepreneurship education into the talent training goals of engineering-oriented vocational colleges, establishing evaluation criteria for the quality and effectiveness of cultivating innovative and entrepreneurial talents, and assessing teachers' teaching quality as well as students' learning status can enhance the connotation of high-quality talent cultivation.

5.3 Cultivate students' entrepreneurial awareness

For students of engineering majors in higher vocational colleges, niche differentiation sometimes occurs among team members. In order to successfully complete the entrepreneurial project, senior students should not only have more entrepreneurial expertise, but also accumulate more practical experience to achieve a qualitative leap in innovation and entrepreneurship. Higher vocational colleges should encourage students to participate in innovation and entrepreneurship selection competitions, carry out scientific and technological innovation projects or entrepreneurial projects in practice, so that students can stimulate the potential for innovation, broaden their entrepreneurial horizons and thinking in competition and cooperation, and continue to promote the formation of students' innovation and entrepreneurship achievements. For excellent projects, higher vocational colleges focuses on providing support in terms of venue, funding, and personnel, carrying out project incubation, and helping students establish a sense of identity and confidence in their entrepreneurial roles, forming a virtuous cycle of "practice cognition practice".

5.4 Enhance collaborative development capabilities

While emphasizing the management mechanism of innovation and entrepreneurship education and professional development, higher vocational colleges should focus on the improvement of collaborative participation and collaborative development capabilities of vocational departments, related departments, industries and enterprises. For example, they should collaborate with the Academic Affairs Office to explore the establishment of an integrated innovation and entrepreneurship curriculum system that integrates innovation and entrepreneurship public courses, innovation and entrepreneurship professional courses, and innovation and entrepreneurship activity courses.

From the perspective of enterprise demand and integration of industry and education, higher vocational colleges should continuously deepen their deep integration with enterprise practice, optimize team division of labor and cooperation, and provide diversified services. Higher vocational colleges should also continuously create learning and development platforms for entrepreneurial teams, promote close cooperation and mutual support among members, improve the quality and efficiency of team collaborative development, avoid ecological niche competition and other problems, promote innovation and entrepreneurship teams to have a clearer understanding of their goals, and obtain more comprehensive theoretical and practical guidance.

In the context of innovation driven development, higher vocational education needs to cultivate a large number of innovative and entrepreneurial talents. By analyzing the fit between niche theory and vocational innovation and entrepreneurship education, we can better understand the value implications of cultivating students with innovation and entrepreneurship abilities. In response to the current situation of cultivating innovation and entrepreneurship abilities among vocational engineering students, this article provides path choices from four aspects: optimizing teacher professional structure, innovating vocational teaching paradigms, cultivating student entrepreneurial awareness, and enhancing collaborative development capabilities, in order to improve the innovation and entrepreneurship abilities of high skilled scientific students, cultivate more innovation and entrepreneurship talents, and further serve local economic and social development.

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Special Project on Philosophy and Social Sciences Research in Higher Education Institutions in Jiangsu Province: Research on Enhancing Entrepreneurship Ability of Engineering Students in Vocational Colleges Based on Ecological Niche Theory (2019SJB455).

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