

Exploration and Research about the Improvement of Students' Innovation and Entrepreneurship Capacity under the New Education Mode

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Abstract—“Public entrepreneurship and mass innovation” are the new requirements put forward by the era, therefore, colleges have listed innovation and entrepreneurship education into one of the main directions for education reform. The exploration of college education model takes the big era as the background and profoundly understands the deficiencies of the innovation and entrepreneurship education system under the new model. It can provide a basis for each university to determine the direction and make a correct judgment. This article takes the Bioengineering Department of the University of Science and Technology Liaoning as the example, and explores the feasibility for jointly building a new education system under the mutual penetration and mutual integration of innovation and entrepreneurship education with professional education, so as to cultivate more high layer and high level talents for the society.

Keywords—University of Science and Technology Liaoning; Innovation and entrepreneurship; Professional teaching; New education system

I. INTRODUCTION

In the new century, the education industry of our country is now gradually marching towards popularized lifting stage at an amazing speed, and colleges have become the effective approach for injecting fresh blood into all fields to build an innovation-originated nation. Through regarding innovation as the characteristics, and entrepreneurship as the objective, what we want is to conduct thinking training and capacity cultivation step by step. These two contents are closely related, mutually penetrated and integrated. In the book called *Innovation and Entrepreneurship Spirits*, Peter Drucker combined lots of enterprise cases, and conducted separate pages of discussion about the connotation of innovation and entrepreneurship, the relationship thereof and mutual penetration and integration, etc. [1-2]. As for colleges, they take the cultivation of students' innovation capacity, innovation consciousness and entrepreneurship skills as the basic contents, and strive to cultivate high-qualified innovation-oriented talents, and build new education system. As for college students, their ultimate objective is to flexibly apply the professional knowledge learned thereby in the practice of innovation and entrepreneurship, and apply their knowledge.

II. DOMESTIC AND OVERSEAS INNOVATION AND ENTREPRENEURSHIP EDUCATION RESEARCH PROGRESS

In America, it has already had above 60 years of history in carrying out innovation and entrepreneurship education, and in 1947, it was started at Harvard University. In 1967, Babson College set entrepreneurship courses. The innovation and entrepreneurship education for college students are regarded as the “direct driving force” for national economic development, so entrepreneurship specialties emerged among colleges, and there were even the generation of highly educated talents, such as the cultivation of master and doctoral candidates [3-4]. In British, in 1987, “Higher Education Entrepreneurship” Plan was sponsored by the government [5]. At home, the research about innovation and entrepreneurship education was started relatively late. Such education mode truly came into people's sight until Tsinghua University held the First Entrepreneurship Plan Competition in 1999, and attracted lots of attentions. However, the Party Central Committee and the Government paid high attention to the innovation and entrepreneurship education when putting forward innovation and entrepreneurship education related development strategies during the 17th CPC National Congress, and then in 2010, the Ministry of Education issued the Opinions about energetically promoting the Opinions for the Innovation and Entrepreneurship Education of Colleges and Universities as well as the Self-employment Work of College Students. All of these can indicate that practical actions were used to promote the progress of innovation and entrepreneurship education.

III. EXISTING PROBLEMS FACED BY THE INNOVATION AND ENTREPRENEURSHIP EDUCATION IN COLLEGES

From the moment when “science and technology constitute the primary productive force” is put forward, it has established the important position of talents in the field, while colleges are the cradle for cultivating talents, and in colleges, the cultivation of innovation and entrepreneurship consciousness for students at school is the footstone for social development. From the layer of the state, lots of documents and policies have been issued to support such education. For colleges, in combination with the advantages of all places, it is requested to actively explore and build innovation and entrepreneurship education

mode, and make its form different and characteristic. But there may be lots of problems and challenges on this road, which require us to have enough faith to go smoothly and stably on this road.

Students lack in confidence, and entrepreneurship knowledge. Except for requesting entrepreneurs to have certain accomplishments in professional knowledge, entrepreneurship activities also request them to master certain knowledge of management, marketing, and political policies, and even some financial knowledge. Obviously, current college students generally cannot comprehensively integrate all of these knowledge [6], so they often don't have faith in conducting entrepreneurship activities, especially for universities of science and technology, and there are few arrangements of innovation and entrepreneurship courses. Although from 2012, as per the requirements of the Ministry of Education, colleges should open no less than 32 credit hours and no less than 2 credits of Entrepreneurship Foundation course. For colleges that have the capacity to open innovation and entrepreneurship education course, it is requested to provide sufficient guidance and support. But for students, the response and participation enthusiasm for the setup of these course are not high, and mostly they are completing the task. Besides, the course hours are limited, and it is not easy to understand the profound meaning, let alone apply it in actual entrepreneurship practice. Even if you have entrepreneurship idea, and can actively contact with the teacher, there are extremely few in-depth exploration after class.

Students mechanically apply the existing mode, with the innovation below the average. Along with the innovation and entrepreneurship education of colleges being successively conducted into the in-depth stage, some schools that have obtained good effect started to make a figure, but there are also some schools completely neglecting the difference among schools as well as the difference of emphasis between the same specialty in different schools, and they merely blindly repeat what the book says, and apply mechanically. In the recent years, various innovation and entrepreneurship competitions have emerged in endlessly, and generated various kinds of new entrepreneurship projects, of which there are few splendid projects that can attract people's attention. However, more and more of them are conservative traditional entrepreneurship projects, such as copy shop, coffee shop, dessert shop and other projects with low technological contents[7]. There are few distinctive entrepreneurship projects, and the degree of innovation is low. Thus, the emphasis is to broaden students' thoughts, and make their concepts ahead of time, and carry out creative education. The stronger the students' innovation consciousness is, the more beneficial it is for promoting the quality of students.

The participation enthusiasm of professional teachers is low. Academic background of college teachers occupies a big proportion, and they have no entrepreneurship experience, let alone systematic training, and this has resulted in the entrepreneurship and the professional education going separate ways. Actually, professional teachers have their own misery, and don't know where to start rather than unenergetically responding. Besides, professional teachers generally bear lots of scientific research task, teaching task, professional

construction and other work, and it is difficult for them to have enough time and spirits to study innovation and entrepreneurship education. Moreover, there are no regulations of college and even college layer for supporting and awarding, it is difficult to mobilize the enthusiasm of professional teachers, and the timeliness of innovation and entrepreneurship education is delayed again and again.

IV. THE INTEGRATION OF INNOVATION AND ENTREPRENEURSHIP EDUCATION WITH PROFESSIONAL EDUCATION

Taking the Bioengineering Department for the Chemical Engineering Institute of the University of Science and Technology Liaoning as an example, explore the education mode that can organically combine innovation and entrepreneurship education with professional education.

Integrate with professional cultivation; if you want to obtain obvious effect in innovation and entrepreneurship education, innovation and entrepreneurship spirits should match and keep pace with theoretical knowledge. We professionally emphasis on the cultivation of students' innovation thoughts and innovation capacity, take the user demand and market demand as the professional cultivation policy, and the objective is to deeply cultivate the professional skills of undergraduate students majoring in bioengineering, adapt to the enterprise and social demands, the professional science quality and professional capacity of sustainable development, innovation consciousness and entrepreneurship concept. Emphasize on the cultivation of innovation and entrepreneurship capacity in professional reform process, and cooperate with enterprises to build new type of course framework. Jointly work with the first-line management and technical backbones of relevant industrial enterprises in the analysis of professional cultivation objective, confirm talent cultivation positioning, innovation capacity and entrepreneurship skill standards, explore the integration of course and internship practice, and build the talent cultivation mode good for the innovation capacity of undergraduates and the professional quality cultivation; integrate innovation and entrepreneurship education with professional education; change the original teaching mode of undergraduates majoring in bioengineering.

Integrate with professional course; combine professional characteristics and the characteristics of students, improve the teaching mode as per the circumstances. Under the assistance of advanced information technology, gradually improve the boring sense of traditional teaching, and integrate distinctive and characteristic concepts into teaching, and make it become unique teaching system. Enlightenment and argument are good teaching mode, and the stereotype teaching of professional knowledge is inevitable, but in the teaching process, it can be more vivid and interesting to insert argument mode, and it can also facilitate students to learn and memorize, and the active participation of students can be more topical. The "integration of science and education" is also another combining point of the new education system, and the conversion of scientific research achievements into teaching can make the knowledge understanding more thorough and professional. Firstly, set up professional core courses and aim at the market demand. As

per the post demand of the specialty, and the relevant employment occupational qualification standards participating in the exhibition, integrate the teaching contents, reform the teaching mode and evaluation mode, adopt various teaching methods in the teaching process, combine after-class practice, promote students to accept the learning of advanced knowledge of the specialty, and then on the basis of possessing solid professional knowledge, cultivate students' divergent thinking and innovation consciousness, and under the precondition of possessing all of these capacities, intentionally integrate relevant discipline knowledge for entrepreneurship information integration and industrial development, and develop 1-2 professional core courses related to innovation and entrepreneurship. Secondly, set up new technical subject of learning and practical courses. During the sophomore year, set up 2-3 weeks of special courses about new technologies, which will mainly carry out the education of new dynamics about the academic frontier and enterprise technical development, etc. During the junior year, set up 2-3 weeks of new technical practice courses and the new technical practice courses mainly carry out the practical training of hands-on activities with certain innovation capacity and innovation awareness. In the formulation process of teaching plan, combine the successful experience and approach of reforms in other colleges as well as the characteristics of disciplines. Thirdly, in the innovation and entrepreneurship education reform process, it is requested to reinforce the teaching staff construction. Arouse the enthusiasm of teachers, reinforce the construction of teaching team, input more people in the innovation and entrepreneurship education system, and encourage teachers to put innovation and entrepreneurship cases, etc. into professional course teaching. In order to go further and more smoothly on the road of innovation and entrepreneurship, the scale and personal capacity of teaching team are extremely important, so it is requested to input lots of fund support in talent construction, such as training and further education, . With the reinforcement of overall capacity for the teaching team, it can be more effective, and can also more accurately seize the market trend, look into advanced information, and then teach students in accordance of their aptitude, and take three-way action of "thinking, learning and teaching".

Integrate with the practical platform; in order to improve the practical innovation capacity of college students, it is requested to conduct innovation and entrepreneurship practical activities, and fully play the school-enterprise cooperation advantages for realizing the organic integration of teaching, learning, research, production and usage, and then by virtue of the enterprise platform, take what they need respectively. Actively dig and fully play the influence, popularity as well as software and hardware resource advantages of small and medium-sized enterprises in domestic and international fields, build the platform that can meet the cultivation and training objective of students' engineering practice knowledge, engineering practice capacity, innovation spirits, realize the construction of new mode for the conversion of teaching scientific research achievements, reinforce the new mode of practical innovation application capacity talent re-cultivation. After introducing enterprises into colleges and laboratories, integrate teaching, scientific research and scaled production.

On such comprehensive practice platform, enterprises can obtain scientific research achievements therein, and through making improvement, they can be made into finished products suitable for scaled production. Colleges can provide a window that can dock with enterprises for teachers, develop the scientific research achievements meeting the actual demand of enterprises and the society, realize industrialization, and make the scientific research achievements become the productivity with actual application, fish out the technical conditions about industrialized production that can meet the actual application as well as the biological high-tech products that can bring economic benefits to the society and the people. Practical platform can provide a place for students to realize innovation and entrepreneurship ideas, fully use the professional theoretical knowledge of teaching and learning and let the innovative thinking run through it, and then combine enterprise production, and realize the entrepreneurship of school days.

V. CONCLUSION

Along with the social development and the progress of the era, professional education teaching and talent cultivation objective are gradually converted to the comprehensive training and cultivation of students' innovative thinking, creative spirit and entrepreneurship capacity. Under the current era of "public entrepreneurship and mass innovation", it is extremely important to cultivate students' innovation and entrepreneurship consciousness and thinking. Through entering into the enterprise for internship, college students can personally perceive entrepreneurship difficulty, and tedious operation; establish correct entrepreneurship value among contemporary college students, affirm their entrepreneurship faith in working hard, unflaggingly and marching forward courageously. Thus, the college education is in urgent need to promote the new mode that organically combines innovation and entrepreneurship education with professional education.

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