

# Research on Innovation and Entrepreneurship Education in Universities Based on Triple Helix Theory

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doi:10.56397/RAE.2023.02.06

## Abstract

Mass entrepreneurship and innovation education is an effective way to cultivate people's innovative spirit and drive, and an important engine to promote economic development. Improving the education system for innovation and entrepreneurship can improve the quality of college personnel training and promote students' employment. However, there are still some problems in the education of innovation and entrepreneurship in colleges and universities, such as weak educational foundation, inadequate implementation of government policies, and low participation of enterprises. In view of the existing problems, based on the triple helix theory, the paper constructs a trinity innovation and entrepreneurship education system of colleges, governments and enterprises, and explores the innovation and entrepreneurship education reform mode in colleges and universities.

**Keywords:** specialization and integration, innovation and entrepreneurship education, triple helix theory, compound talents

## 1. Necessity of Promoting Innovation and Entrepreneurship Education in Colleges and Universities

With the rapid development of knowledge economy and science and technology, as well as the challenge of employment difficulties brought by the popularization of higher education, the strategic position of mass entrepreneurship and innovation education in the national economic and social development is becoming more and more prominent, and the mass entrepreneurship and innovation education of college students has gradually become the focus of the reform and development of higher education in China. State Office No.36 [2015] put forward the reform goal of establishing and improving the double-creation education system in colleges and universities by 2020. Guofa [2018] No.32 puts forward higher requirements for double-venture education, which has become a strategic task for the reform and development of colleges and universities.

The Ministry of Education has also made it clear that we should promote the reform of mass entrepreneurship and innovation education as a breakthrough to improve the competitiveness of colleges and universities.

### 1.1 It Is an Inevitable Requirement for Building an Innovative Country in the New Era

Cultivating compound talents with innovative thinking, creative spirit and innovative ability who can adapt to the complex and changeable international environment is the necessary move to connect the national talent development strategy and the construction of innovative national development strategy. Vigorously developing innovation and entrepreneurship education is the demand of China's higher education from the elite stage to the mass stage of transformation and development, is a new direction of education to adapt to China's current social

and economic development, and is an important way to cultivate high-quality employment and entrepreneurship talents of Chinese college students. Cultivating compound talents with innovative thinking, creative spirit and innovative ability who can adapt to the complex and changeable international environment is the necessary move to connect the national talent development strategy and the construction of innovative national development strategy. Vigorously developing innovation and entrepreneurship education is the demand of China's higher education from the elite stage to the mass stage of transformation and development, is a new direction of education to adapt to China's current social and economic development, and is an important way to cultivate high-quality employment and entrepreneurship talents of Chinese college students. Gao Zejin once said: The double creation education which does not combine with the specialty is like the water without a source; Professional education without the combination of mass entrepreneurship and innovation is a stagnant pool. (Gao Zejin, 2021) At present, under the correct guidance of national policies, China's mass entrepreneurship and innovation education has made some achievements, but the awareness and ability of carrying out innovation and entrepreneurship education in colleges and universities are not strong, and the innovation and entrepreneurship system needs to be improved urgently.

### *1.2 It Is the Inevitable Choice to Deepen the Reform of Professional Education in Colleges and Universities*

In the new era, higher education should not only cultivate professionals with solid basic knowledge, but also innovative talents with the ability to use knowledge and innovation. However, the current personnel training in colleges and universities in China pay too much attention to the imparting of knowledge, ignoring the cultivation of students' innovative spirit and entrepreneurial ability, this kind of professional education which ignores practical teaching can not meet the real needs of social development. Therefore, colleges and universities should adjust and reorganize their majors according to the diversified development of the society and the needs of the training objectives of double-creation education, promote the organic integration of professional education and double-creation education, strengthen the concept of double-creation education and deepen the reform of professional education through the integration of professional curriculum teaching and curriculum practice.

### *1.3 It Is the Main Way for Colleges and Universities to Enhance Their Ability to Serve the Society*

Serving social and economic development is one of the functions of colleges and universities. Under the background of innovation-led development strategy, it is urgent for colleges and universities to face the main battlefield of local economic development, face innovation-led development strategy, give full play to the professional characteristics of colleges and universities, accurately locate personnel training objectives, and meet the needs of local economic development for talents. Serving social and economic development is one of the functions of colleges and universities. Under the background of innovation-led development strategy, it is urgent for colleges and universities to face the main battlefield of local economic development, face innovation-led development strategy, give full play to the professional characteristics of colleges and universities, accurately locate personnel training objectives, and meet the needs of local economic development for talents.

### *1.4 It Is a Booster to Alleviate Employment Pressure and Expand Employment Channels*

In recent years, the number of college graduates has gradually increased, the traditional jobs have been unable to meet the needs of college students' employment, and the employment pressure of college students is increasing. Under the background of difficult employment, colleges and universities must carry out innovative entrepreneurship training, strengthen the connection between double-creation education and professional practice education, integrate double-creation education into professional teaching, stimulate students' enthusiasm for self-learning, cultivate students' innovative spirit and entrepreneurial ability of daring to explore and practice, and cultivate more innovative talents. We should open up a new pattern of diversified entrepreneurship and employment, and promote high quality employment of college graduates.

## **2. The Dilemma of Innovation and Entrepreneurship Education in Colleges and Universities**

In recent years, under the guidance of the national education reform policy, double-creation education has achieved certain results. However, from the perspective of the triple helix theory, the multi-resources of the government, enterprises and universities are still in a dotted state, which has not formed a joint force, nor has it formed a multilateral interactive resource sharing platform, let alone twisted into a rope. (Chen Yingbin, 2019)

China's traditional higher education teaching is still based on professional teaching, teachers focus on the imparting of professional knowledge and students' mastery of professional skills, not to integrate double-creation education into professional education, let alone into the talent training system, this kind of education which pays too much attention to professional knowledge neglects the cultivation of students' innovative and entrepreneurial ability. Creative education is only a part of career planning or employment guidance or employment training courses for college students, and there is no effective integration between creative education and professional education. Some colleges and universities do not pay enough attention to double-creation education, do not actively promote the development of double-creation education, and have not yet built a three-dimensional,

multi-level curriculum system. Teachers' awareness of double-creation is insufficient, teaching content is outdated, students' innovative thinking has not been stimulated, and their enthusiasm for entrepreneurship is insufficient. Shuangchuang teachers are weak, lack of experienced teachers, Shuangchuang courses are mainly elective courses, and the quality of teaching is low. There are few double-creation practice activities, and the practice platform is seriously inadequate. Influenced by the traditional professional education system, the students' awareness of mass entrepreneurship and innovation is still relatively weak, and they do not know enough about mass entrepreneurship and innovation education, which leads to the low participation of mass Entrepreneurship and Innovation Education, and even regards it as an optional course that can be learned or not, which affects the normal development of mass entrepreneurship and Innovation Education. (Wu Hui, 2021)

### *2.1 The Implementation of Government Policies Is Not in Place*

The national top-level design attaches great importance to mass entrepreneurship and innovation education, which points out the direction for the development of mass entrepreneurship and innovation education in colleges and universities. However, local governments have not formulated feasible plans according to local characteristics when promoting the development of mass entrepreneurship and innovation education in colleges and universities, so as to effectively promote the implementation of mass entrepreneurship and innovation, only staying at the macro guidance level. There are many documents issued by the government, few specific implementation policies, lack of specific guidance in school-enterprise cooperation, and the specific problems in cooperation can not be solved timely and effectively, which restricts the deep cooperation between schools and enterprises. In the practice of mass entrepreneurship and innovation education, the government should promulgate relevant laws and regulations in time and create a stable environment to promote the development of mass entrepreneurship and innovation education in colleges and universities.

### *2.2 Low Participation of Enterprises*

The pursuit of profit maximization is the goal of enterprise development, but also a measure of enterprise efficiency. In the double-creation education of colleges and universities, enterprises need to give corresponding human, material and financial support to colleges and universities, and according to the needs of enterprises, cooperate with the school to formulate personnel training programs to cultivate innovative and entrepreneurial talents adapted to the development of enterprises. However, enterprises believe that the double-venture education in colleges and universities is difficult to bring lasting profits to enterprises, so the enthusiasm of enterprises to participate in double-venture education is not high. On the other hand, because the double-creation teachers in schools have no relevant working experience in enterprises, they pay too much attention to the imparting of theoretical knowledge in the curriculum, lack of practical operation, and the students trained are difficult to meet the needs of enterprises. Based on the above reasons, enterprises will not increase their investment in double-venture education, and their enthusiasm to participate in school-enterprise cooperation will not be high.

## **3. The Path of Implementing Innovation and Entrepreneurship Education in Colleges and Universities from the Perspective of Three and Three Helix**

Henry Etzkowitz (an American sociologist) and Reuter Redsdorf (a Dutch scholar) put forward the triple helix theory of mutual benefit, win-win and benign interaction among universities, industry and government in 1995. In the triple helix theory, universities, government and enterprises are the main body and participants of innovation. They can not only maintain independence, but also achieve harmony and complementarity, and create social value together. (Henry Etzkowicz, 2006) The interaction among universities, government and enterprises is the necessary condition to promote the effective implementation of creative and innovative education. Based on the triple helix theory, universities, government and enterprises must take the common interests and needs as a link, and adjust the organizational boundaries in time according to their own development, each organization will have a linkage effect on other organizations while expanding its own development. The three are independent and interrelated, forming linkage and coupling due to common goals, and forming a spiral and efficient resultant force.

Creative and innovative education is an educational phenomenon driven by the national strategy of innovative talents, and it is the product of communication and influence among universities, governments and enterprises. Opinions of the General Office of the State Council on the Implementation of Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities, Some Opinions of the General Office of the State Council on Deepening the Integration of Industry and Education and Opinions of the State Council on Strengthening the Implementation of Innovation-Driven Development Strategy and Further Promoting the Innovation and In-depth Development of Mass Entrepreneurship. The promulgation of national policies provides policy guidance for innovation and entrepreneurship education in colleges and universities. It is pointed out that colleges and universities should innovate the talent cultivation mechanism, enrich the teaching content, constantly promote the organic combination of teaching, scientific research and practice, and enhance students' innovative spirit and entrepreneurial ability. The government should constantly explore the development mode of

innovative platforms and guide social resources to support double creation. Enterprises should improve the collaborative innovation ecosystem with universities and build a resource-sharing network of integration of industry and education. It can be seen that the tripartite cooperation subjects of universities, enterprises and governments are the key elements to promote the development of double-venture. The three main bodies must take the common interests and needs as a link, form a good interactive relationship through optimizing the allocation of resources, constantly penetrate each other, achieve mutual benefit and win-win situation, constantly carry out benign information cycle dissemination, and form a spiral upward double-creation education ecosystem.

In the era of knowledge economy, the competition between countries is not only the competition of comprehensive national strength, but also the competition of talent strength. Cultivating and bringing up high-quality compound talents with innovative ability is an important way to improve the comprehensive national strength and realize the great rejuvenation of the Chinese nation. The students trained by the traditional employment-oriented exam-oriented education can no longer meet the needs of the society for compound talents. Therefore, in addition to strengthening their own construction, colleges and universities also need the government and enterprises to participate in the double-creation education, and the three spiral subjects are deeply integrated to form a benign interactive triple helix cooperation mode, so as to improve the quality of higher education. Applying the triple helix theory to innovation and entrepreneurship education can better coordinate the relationship among universities, enterprises and the government. Colleges and universities cultivate talents for enterprises to adapt to the development of enterprises, which not only meets the needs of enterprises for talents, but also solves the problem of employment of college students, and at the same time, it is conducive to promoting the development of local economy and maintaining social stability. The government escorts the collaborative education of universities and enterprises, improves the investment enthusiasm of enterprises, and provides policy guarantee for school-enterprise cooperation. Enterprises actively participate in efficient innovation and entrepreneurship education activities, cooperate with universities to cultivate talents, and promote the maximization of the benefits of the transformation of innovation and entrepreneurship achievements in colleges and universities.

### *3.1 Taking Colleges and Universities as the Leading Role and Strengthening Self-Construction*

Colleges and universities are the main body to realize innovation and entrepreneurship education, and play a key role in mass entrepreneurship and innovation education. Colleges and universities need to coordinate with enterprises to formulate personnel training programs, adjust curriculum structure in time, and provide teachers for innovation and entrepreneurship education.

#### *3.1.1 Constructing the Double Creative Ecosystem and Perfecting the Double Creative Teaching Platform*

Colleges and universities should fully understand the importance of double-innovation education, further improve the construction of double-innovation education ecosystem, and point out the direction for the cultivation of innovative talents. Through the teaching platform of modern technology, students' teaching experience is enhanced, students' data thinking and digital application ability are trained, and more immersive scenes are provided for teachers and students. By building and improving the digital teaching platform, we can provide more opportunities for students to learn and practice, and make higher education become an innovative activity with rich teaching content and fruitful results.

#### *3.1.2 Constructing Three-Dimensional Knowledge System of Double-Creation Curriculum and Establishing the Concept of Big Entrepreneurship*

Document No.3 [2010] of the General Office of the Ministry of Education points out that innovation and entrepreneurship education should be included in the teaching plan of professional education, and a multi-level and three-dimensional curriculum system of innovation and innovation education should be established to realize the organic integration of innovation and entrepreneurship education and professional education. Document No.36 issued by the State Administration of Education (2015) proposes that colleges and universities should tap the double-creation educational resources of various professional courses, adjust the discipline structure, and realize the cross-integration of discipline teaching and double-creation teaching in accordance with the overall goal of cultivating innovative talents, so as to meet the new needs of social development. Colleges and universities should make use of their own disciplinary advantages and professional characteristics, break through the barriers in the field of disciplines, actively explore the elements of double-creation in professional courses, emphasize the multi-disciplinary intersection of double-creation courses, (Wang Xi, 2019) form a cross-department, cross-disciplinary and cross-professional double-creation teaching curriculum system, and form a double-creation teaching system. To form a scientific and standardized compulsory courses + elective courses + professional training + project practice and other four modules of double-creation teaching curriculum system, to achieve the transition of personnel training from a single type to a compound type.

### 3.1.3 Introducing Industry Mentors and Innovating Teacher Cultivation Mechanism

In the double-creation education, teachers play a leading role and are the guides and implementers of innovative education in schools. The smooth development of mass entrepreneurship and innovation education needs teachers who have both solid professional knowledge and the ability of mass entrepreneurship and innovation education. However, the full-time teachers in colleges and universities are far from being able to meet the needs of the development of mass innovation and innovation education. Therefore, Hezhou University will practice teaching base in the enterprise, by teachers and enterprise experts to demonstrate for students, so that the theory and practice to achieve an organic combination. (Wang Xueyan, 2019) In the construction of double-creation teaching staff, we should continuously increase investment, train a group of specialized teaching staff, and provide environmental protection for the sound development of the teaching staff. For example, through regular training, special training and other forms, the introduction of industry mentors, the establishment of outstanding alumni joint venture base, the formation of a professional mentors + mass entrepreneurship and innovation mentors + enterprise mentors diversified mass entrepreneurship and innovation teachers team, to provide talent reserves for the mass entrepreneurship and entrepreneurship teachers team in colleges and universities.

### 3.2 *Strengthening Organizational Coordination with the Support of the Government*

In the triple helix, the government, universities and enterprises are mutually independent and interrelated, and in the double-creation education, the three parties should form a symbiotic relationship of mutual benefit and win-win cooperation. The government should provide policy guarantee for promoting the development of mass entrepreneurship and innovation education in colleges and universities, as the main body of coordinating the demand for talents in colleges and universities and enterprises, and successfully promote the smooth development of mass entrepreneurship and innovation education.

#### 3.2.1 Perfecting the Laws and Regulations of Mass Entrepreneurship and Innovation Education and Forming a Policy Guarantee System

Under the strategy of innovation-driven development, the government should coordinate universities and local enterprises by means of policies and platforms, clarify the rights and obligations of universities, governments and enterprises, construct a new pattern of coordinated promotion among universities, governments and enterprises, and actively formulate policies related to double-creation education in colleges and universities. Promote the flow of all kinds of social resources to the mass entrepreneurship and innovation education system. In formulating policies, we should strengthen the linkage of multiple departments and take into account the legitimate rights and interests of schools and enterprises. Encourage enterprises to participate in running schools, and jointly promote the adjustment of double-venture education and industrial structure with universities, so that the employment needs of enterprises and the training of talents in universities can achieve zero distance docking. Enterprises participating in entrepreneurship education should be given certain preferential subsidies to promote the establishment of a demand-oriented talent training model in colleges and universities, so as to realize the deep integration of universities and enterprises in all aspects. (Wang Qiuyu, 2018)

#### 3.2.2 Build a Double Creative Education Practice Platform and Improve the Public Service System of Entrepreneurship

In the double-creation education, the government is not only the policy maker, but also should undertake the construction of double-creation resource sharing platform, and constantly improve the hardware equipment of double-creation education practice platform. Colleges and universities should base themselves on the cultivation of students' innovative spirit and entrepreneurial ability, and embody the educational function of higher education. Enterprises pay attention to the economic benefits brought by scientific and technological innovation, and the pursuit of economic interests is the essential requirement of enterprises. The government should promote scientific and technological innovation by carrying out mass entrepreneurship and innovation education activities to meet the needs of enterprises for talents, and should not only focus on solving the employment problem. In the double-creation education system, the government should integrate social resources according to the actual situation of local economic development, actively build communication channels, actively participate in the cooperation between universities and enterprises, establish a resource sharing platform for government, universities and enterprises, accelerate the transformation of scientific and technological achievements, and serve the development of local economy.

#### 3.2.3 Give Resources Input and Public Opinion Guidance to Enhance the Influence of Mass Entrepreneurship and Innovation Education

The practice of mass entrepreneurship and innovation can not be separated from the market demand, which determines that the development of mass entrepreneurship and innovation can not rely solely on the investment of colleges and universities, and the government's financial support and public opinion guidance are also key factors affecting the effectiveness of innovation and entrepreneurship education in colleges and universities. The

government should make achievements in the introduction of double-venture mentors, the construction of double-venture incentive mechanism and the financing of college students' entrepreneurship, so as to create a good external environment for the development of double-venture education. At the same time, we should conform to the new situation of the current national innovation and development strategy, encourage students to carry out mass entrepreneurship and innovation, cultivate students' innovative spirit and entrepreneurial ability, organize students to participate in Internet +, Challenge Cup and other college students' mass entrepreneurship and innovation activities, give affirmation or reward to enterprises and individuals who won the prize in the competition, and use modern network media to vigorously promote the culture of double creation.

### *3.3 Taking Enterprises as Carriers to Improve the Effectiveness of Entrepreneurship*

In the triple helix, enterprises are the providers of information resources for mass entrepreneurship and innovation education in colleges and universities, can build a platform for mass entrepreneurship and innovation education, and can give financial support. In the practice of school-enterprise cooperation, enterprises should actively participate in it, make suggestions for the cultivation of talents in colleges and universities, and provide talent reserve for the long-term development of enterprises.

#### 3.3.1 Actively Participate in Running Schools and Build a Demand-Oriented Teaching Community with Universities

Enterprises should take the initiative to recognize the close relationship between talent training and their own interests, and actively integrate into the double-creation education in colleges and universities. Deeply excavate and utilize the resources of colleges and universities, continue to deepen the content of cooperation with colleges and universities, actively participate in the construction of teachers of double-creation education, regularly train teachers, improve the level of enterprise practice of teachers in colleges and universities. At the same time, we can also send enterprise personnel to colleges and universities to carry out entrepreneurship training teaching, encourage employees to study, and build a double-venture education curriculum system with colleges and universities, which takes into account the interests of both sides, and regard it as a long-term strategy for enterprise development, so as to realize the deep integration of industrial chain and talent chain. The teaching mode of combining theoretical teaching in colleges and enterprises with practical experience and case analysis enables students not only to master solid theoretical knowledge, but also to have rich practical experience in entrepreneurship. Through the form of joint training and co-construction, a practice-oriented education and training system, (Wang Zhanren, 2015) has been established for college students to learn by doing, combine learning with doing, and promote doing by learning, which helps the development of innovative education in colleges and universities.

#### 3.3.2 Actively Build a Platform for Resource Sharing and Build a Community of Industry, University and Research

The transformation of scientific research achievements in universities can not be separated from the cooperation of the government and enterprises, only the three cooperate and complement each other, can we promote the process of building an innovative country in China. Enterprises will cooperate with universities to show the technology, products and other related achievements they need for their own development in the form of topics, provide corresponding support for students with entrepreneurial foundation, fully mobilize the enthusiasm of students, and at the same time, make use of the advantages of industrial resources, practical experience and other resources to provide financial support for scientific research in universities, and improve the conversion rate of scientific and technological achievements.

## **4. Epilogue**

The triple helix theory has played a very good guiding role in the effective development of innovation and entrepreneurship education in colleges and universities. The establishment of universities, government, enterprise tripartite linkage of ecological education system, both to meet the main functions of the realization of their own, but also to break the boundary barriers, the three main bodies for effective interaction, to achieve the sharing of resources, the formation of cross-upward spiral, promote the sustainable development of university education.

## **Fund Project**

Key Laboratory of Big Data for Innovative Design in Guangxi Universities (GXUIDDL-2023004); Hezhou University Teaching Reform Project Research on Teaching Model under the Background of Industry-University-Research Cooperation-Taking Art Specialty as an Example (hzxybjg202018); In 2021, Guangxi Higher Education Undergraduate Teaching Reform Project was established, Reform and Practice of Innovative and Entrepreneurial Talents Training Model for Media Majors under the Background of Rural

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