
Problems and Solutions in the Cultivation of Undergraduate Innovation and Entrepreneurship Ability

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To cite this article:

Fang Lide, Meng Weihua, Wei Zihui, Li Honglian, Zhu Yan. Problems and Solutions in the Cultivation of Undergraduate Innovation and Entrepreneurship Ability. *Education Journal*. Vol. 11, No. 4, 2022, pp. 163-168. doi: 10.11648/j.edu.20221104.14

Received: June 16, 2022; **Accepted:** July 9, 2022; **Published:** July 18, 2022

Abstract: Since the 13th Five-Year Plan, the state has paid more attention to the cultivation of undergraduate innovation and entrepreneurship ability. Local universities and governments should find out the problems in the cultivation, change their ideas, actively respond to them, and give full play to the innovation and entrepreneurship education function of universities and governments. In the process of cultivating the innovation and entrepreneurship ability of undergraduates, there are some problems emerging gradually, such as the rigid level of education and teaching management in colleges and universities, the limited level of educational teachers, the poor enthusiasm of students, the insufficient enterprise motivation, and the lack of policies. Therefore, we will actively promote the reform of innovation and entrepreneurship education and make it run through the whole process of talent training, which is the breakthrough point for comprehensive deepening of reform in undergraduate teaching and education and consequently uplifting of education quality. We should integrate the cultivation of innovation and entrepreneurship into the student training mode, optimize the classroom teaching mode, integrate the cultivation of innovation and entrepreneurship into the talent training scheme, improve the course assessment mode, deepen the reform of the course system, jointly build the school enterprise cooperation training mode, strengthen the integration of resources, and enhance the government's financial and policy support to cultivate first-class talents with international competitiveness.

Keywords: Undergraduate, Innovation and Entrepreneurship, Existing Problems, Solution

1. Introduction

With the development of social economy, the cultivation of undergraduates' innovation and entrepreneurship ability has become an internal requirement to comprehensively improve the quality of higher education, and its importance has been raised to a new level. The ability of innovation and entrepreneurship refers to the ability of students to have innovative spirit and entrepreneurial awareness on the basis of professional learning, to apply the knowledge they have learned to innovation and entrepreneurship, and to promote the transformation of discipline practice [1]. The fierce social competition and the complex and changeable social environment require university teachers to take high moral

values establishment and cultivate outstanding talents with innovation and entrepreneurship ability.

Adhering to the teaching concept of student-centered and focusing on talent training, Chinese colleges and universities promote the cultivation of undergraduates' innovation and entrepreneurship ability in a variety of ways. For example, Zhu Yi et al. studied the impact of teachers' teaching behavior on the cultivation of undergraduates' innovation and entrepreneurship ability, optimized the teaching behavior of research-oriented, encouraging, interactive and lecturing teachers, and promoted the cultivation of undergraduates' innovation and entrepreneurship ability [2]. Jin Feng et al. found that the "tutorial system" can not only stimulate undergraduates' interest in innovation and entrepreneurship, but also promote undergraduates' participation in innovation

and entrepreneurship projects, which is conducive to the cultivation of applied talents [3]. Bai Jinxia studied the problems in the cultivation of innovation and entrepreneurship ability through a questionnaire survey, and built a "combination of production, learning and research" training mode to promote the improvement of innovation and entrepreneurship ability of disciplines and undergraduates, so as to promote the cultivation of applied talents [4].

However, in the actual teaching, the boundaries between theoretical and practical courses are obvious and the proportion of practical courses is low (less than 20%). Students are busy completing credits to meet graduation requirements (most colleges require graduation credits of about 160 credits). Students spend too little time on innovation and entrepreneurship. Teachers' professional titles are directly linked to the class hours. In addition, the school teaching management is rigid, students' and teachers' enthusiasm is poor, the motivation to assist enterprises is insufficient, and the lack of government preferential cultivation policies has become the main problem in the cultivation of undergraduate innovation and entrepreneurship ability.

2. Existing Problems

2.1. Rigid School Teaching Management, Insufficient Motivation for Teachers and Students

The teaching management of colleges and universities has had an important impact on undergraduate innovation education. At present, the teaching management work is rigid. Some colleges and universities have not effectively divided the rights and responsibilities in combination with the actual situation of the school. There is a common situation of "the amount of work does not match personnel". In the actual management work, some administrative personnel have problems such as "buck-passing", "the less trouble the

better", "self-serving, not my responsibility" and so on. In addition, the division of theoretical courses and practical courses in the talent training plan is obvious, which makes it hard to smoothly promote the cultivation of undergraduate innovation and entrepreneurship ability.

Undergraduate innovation and entrepreneurship education cannot be separated from teachers' leadership, especially in topic selection, scientific research direction. At present, the school evaluation mechanism is in the middle stage of paying attention to and getting rid of the "paper-centric, hat-centric, professional title-centric, academic degree-centric, award-centric". Colleges and universities attach importance to the award of winning the prize in the innovation and entrepreneurship competition. Driven by the interests, the resources are monopolized. The teachers' evaluation of professional title is directly linked to the class hours. Teachers are unable to devote themselves to it, lack of spiritual motivation, and have a negative impact.

Influenced by the traditional score-oriented education, undergraduates attach importance to basic courses such as classroom learning and classroom assessment after entering universities, resulting in insufficient time for innovation and entrepreneurship learning and practice. Taking a science and engineering major in Hebei University as an example, as shown in the figure 1, the graduation requirement of students is 180.5 credits, and the total class time is 2,295 hours. Except for holidays, postgraduate entrance examination or job search time, it is less time used for innovation and entrepreneurship learning and practice. In addition, the university's rules for assessing scholarships and the policy of graduate student recommendation make undergraduates' enthusiasm for innovation and entrepreneurship low, which goes against the original intention of undergraduate innovation and entrepreneurship training.

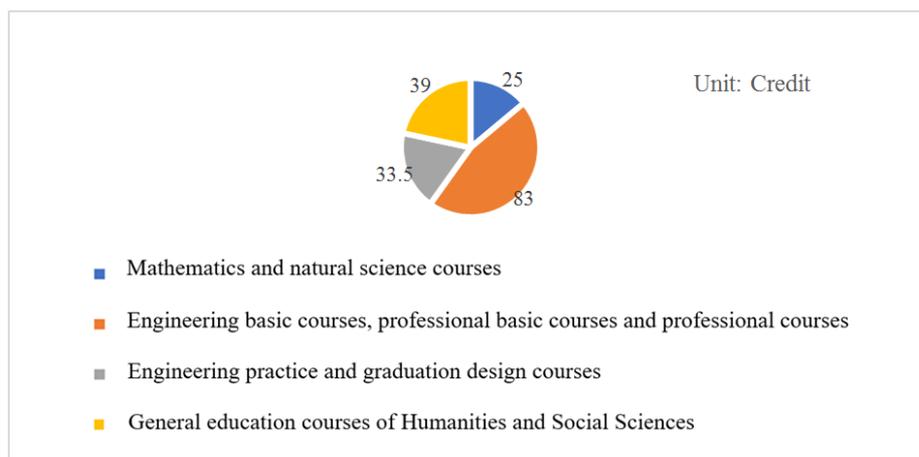


Figure 1. Basic information of credits required for graduation of a science and engineering major in Hebei University.

2.2. Enterprises Lack Interests in Cooperation, Schools and Enterprises Lack In-depth Communication

Enterprises have good innovation and entrepreneurship

resources, but in practical work, they mainly focus on enterprise benefits and lack of interest in the cultivation of innovation and entrepreneurship talents in colleges and universities. Although some enterprises participate in the

cultivation of some innovation and entrepreneurship talents in colleges and universities, they lack effective communication with relevant majors in colleges and universities, and their excellent resources cannot be used for the cultivation of innovation and entrepreneurship talents in colleges and universities. At present, the cooperation between enterprises and universities is only limited to the provision and support of a few teachers and a small amount of funds, lacking in-depth cooperation and the training mode of joint training between schools and enterprises.

2.3. The Government Ignores the Ties Between Schools and Enterprises, Lacks Policy Support for Joint Training

The innovation and entrepreneurship education of universities and enterprises has been recognized by all walks of life. However, the absence of the government in the actual school enterprise cooperation has led to the phenomenon of "one-sided enthusiasm" in universities [5]. The government does not pay enough attention to the cooperation between schools and enterprises, emphasizing short-term benefits over long-term benefits, neglecting the connection between school and enterprise's bridging role, and lacking support and help in funds and policies, resulting in low enthusiasm of enterprises and few effective external resources for colleges and universities. The policy is not perfect enough. Although there are some macro policies to promote school enterprise cooperation, there is a lack of supporting and systematic implementation measures from local governments. In order to introduce legislation on school enterprise cooperation, the responsibilities and obligations of colleges and enterprises in school enterprise cooperation are not clear, and there are no specific incentive and guarantee measures for enterprises to participate in school enterprise cooperation, such as incentives, funds and taxes; The lack of specialized school enterprise cooperation organizations and coordination agencies, and the lack of effective school enterprise cooperation mechanisms lead to great randomness and low quality of cooperation in school enterprise cooperation.

3. Solutions

3.1. Innovating the Student Training Mode, Delegating the Power of the Management Department to the Majors

Colleges and universities should constantly emancipate the mind, innovate ideas, create an atmosphere of innovation and entrepreneurship, actively guide the management departments to put some of the rights of students' training management on the platform based on professional training, break the rigid regulations and improve the quality of teaching management. The management department shall delegate teaching power to the majors, guide the major to adhere to the spirit of seeking truth from facts, formulate a student training mode suitable for the major in combination with its own major, innovate the teaching carrier of professional courses, develop practical open classes, screen corresponding enterprises, and implement innovation and

Entrepreneurship Education. First of all, the major should be based on its own basic situation, combined with the training objectives of innovation and entrepreneurship, and result oriented - what students have learned and whether they have succeeded are far more important than how and when to learn, reasonably set the proportion of classroom teaching and practice, and design and arrange teaching forms suitable for the characteristics of the major. Then, pay attention to the construction of innovation and entrepreneurship curriculum. First, focus on innovation and entrepreneurship courses, including enterprise management, financial accounting, enterprise risk, to promote students to master professional skills. Second, consolidate basic courses, including enterprise foundation and enterprise development, and promote students to learn the process of innovation and entrepreneurship. Third, understand the characteristics, current situation and advantages of social and economic development, and promote undergraduates' understanding of the innovation and entrepreneurship environment. Fourth, pay attention to the existing industries and key projects supported by the state, and guide students' innovation and entrepreneurship [6]. Finally, strengthen the integration of professional courses into the concept of innovation and entrepreneurship, and connect innovation and entrepreneurship enterprises with the basic situation of the major. Focusing on the professional core curriculum, the professional practice curriculum system, starting with the relationship between the major and social production and life, guide students to improve their understanding of self, career and environment, adopt interactive teaching, and promote students' ability to ask questions, analyze problems, and solve problems [7].

3.2. Integrate into the Talent Training Program, Carry out Innovation and Entrepreneurship Education

Starting from the ability expectation of the society for the professional talents, focusing on the complex engineering problems that the specialty needs to solve, design a talent training scheme based on the construction concept of the curriculum system (OBE concept) with the result as the goal orientation, the student as the center, and the reverse thinking method, sort out the professional knowledge system, and establish a reasonable curriculum system. On the one hand, guided by the entrepreneurial process and entrepreneurial practice, around the complex engineering problems that need to be solved by the specialty, entrepreneurship classes are set up to strengthen the general education of innovation and entrepreneurship. Teachers in the school give lectures on the basic knowledge of entrepreneurship, and industry experts are hired outside the school to teach the knowledge of entrepreneurial practice modules. On the other hand, integrate the innovation and entrepreneurship practice, training and practice platform, improve the innovation and entrepreneurship support chain, build a diversified, open and comprehensive college students' training base, and provide project incubators and financial support [8]. Finally, we should attach importance to the "Internet + College Students' innovation and entrepreneurship competition", "Challenge

Cup", "creating youth" and other mass entrepreneurship and entrepreneurship competitions, increase students' practice opportunities, integrate innovation and entrepreneurship education into the whole process of talent training program, and leave enough time for students to carry out innovation and entrepreneurship training [9].

3.3. Optimize Classroom Teaching Mode, Promote Students' Active Learning

Based on the talent training plan, adjust and optimize the classroom teaching mode, innovate relatively fixed, flexible and diverse scientific teaching methods, fully develop students' wisdom, improve their learning efficiency of transforming knowledge into ability, give full play to students' subjective initiative, change passive learning into active learning, and improve students' ability to learn knowledge, flexibly apply and innovate practice. On the one hand, improve the excellent teaching ability of university teachers, reasonably arrange classroom teaching arrangements, do not overemphasize the amount of classroom teaching and theoretical teaching hours, pay attention to the integration of domestic and foreign cutting-edge knowledge, the latest academic research results and successful practical experience into the classroom, pay attention to cultivating students' creative and critical thinking, and stimulate entrepreneurship and innovation inspiration [10]. On the other hand, aiming at solving complex engineering technical problems, the project-based classroom teaching mode is designed by integrating classroom theoretical teaching, practical teaching, heuristic, discussion, participatory and other forms, which not only considers teaching and learning, but also enables students to actively participate in the discovery, analysis and solution of engineering technical problems [11].

3.4. Improve the Course Assessment Mode, Pay Attention to Innovation and Entrepreneurship

According to the training requirements of innovation and entrepreneurship ability, actively promote the improvement of course assessment mode (including assessment content and assessment method), and pay attention to the ability of students to find, analyze and solve problems. On the one hand, according to the training requirements of professional talents, based on the independent thinking of students, reasonably plan the assessment content, and give full play to the "baton" role of the examination: enrich the assessment content, including the understanding, application and innovation of previous knowledge, reduce the assessment of single knowledge point and increase the assessment of comprehensive knowledge system, reduce pure memory test questions and increase case analysis questions that integrate theory with practice. On the other hand, according to the class hour arrangement and outline requirements of the course, the course characteristics and the actual situation of students, the teachers reasonably arrange the course assessment methods [12]. Combine the course process

assessment with the final assessment organically, including the course process assessment based on group discussion, classroom knowledge competition, special research, practical operation, etc., and the final assessment based on the final examination papers, course works and papers, course competition results, etc. Innovate the contents and methods of assessment, encourage students to participate in different forms of teaching activities, and improve the basic quality of innovation and entrepreneurship. We should actively introduce specialized institutions, enterprises and social departments to evaluate the quality of innovation and entrepreneurship education, take the quality of innovation and entrepreneurship education as an important indicator to measure the level of running a school and performance assessment, and accept social supervision [13].

3.5. School Enterprise Cooperation to Train Talents, Provide Internship Opportunities

Enterprises need application-oriented talents, while colleges and universities cultivate talents with professional knowledge. Only when college students go out of school and enter enterprises can they adapt to the development of society [14]. Colleges and universities should strengthen cooperation with enterprises, combine the traditional teaching, lecture and internship practice mode, and let more students have the opportunity to understand the society and enterprises and practice. Colleges and universities need to fully understand their own advantages and carry out multi-faceted cooperation with enterprises, select excellent teachers to enter enterprises for training, learn knowledge beyond books, and apply it to classroom teaching to make up for their own shortcomings. Enterprises participate in the talent training of colleges and universities, actively connect with the scientific research achievements of colleges and universities, and provide project needs, project framework, equipment and space in combination with the basic situation of enterprises. College teachers lead student teams to do demand analysis and translate the knowledge learned by the university into projects. The cooperation between schools and enterprises in cultivating excellent teachers and talents can not only recommend the progress of production, teaching and research, realize the transformation of scientific research achievements, but also cultivate professional application-oriented talents and reserve advanced and sophisticated talents in advance. Promote the deep participation of enterprises in talent training, and initially form a stable and mutually beneficial cooperation system between schools and enterprises in talent training, laying a solid foundation for the real realization of school-enterprise sharing, co-construction and win-win [15].

3.6. The Government Provides Support Policies, Establishes Resource Sharing Between Schools and Enterprises

The cultivation of innovation and entrepreneurship ability is inseparable from the strong support of government departments. They should play their leading role, actively

establish innovation and entrepreneurship policies coordinate various social resources, and optimize and refine incentive policies. First, the government led innovation and entrepreneurship policies and supporting measures: establish relevant facilities, such as setting up an innovation and entrepreneurship expert database and a case display information database, to provide college students with "guidance training supervision" one-stop services; Increase capital investment and tax preference, on the one hand, improve the enthusiasm of joint training between enterprises and universities, on the other hand, provide financial support for the initial turnover of College Students' innovation and entrepreneurship; Optimize policy supervision and guarantee supporting systems, pay special attention to the use of funds and innovation and entrepreneurship projects, and summarize practical experience to supplement and optimize existing policies. Second, the government coordinates social resources and strengthens publicity channels: online publicity of preferential policies for innovation and entrepreneurship and knowledge competitions, such as apps and school official websites that students are interested in, to encourage students to learn and improve the popularity of policies; The preferential policies for innovation and entrepreneurship are popularized offline by means of lectures, training, salons, forums, etc. in combination with the characteristics of universities. Third, the government has optimized and refined the incentive policies suitable for colleges and universities in combination with the actual situation of the region and colleges. Hebei Province has formulated several opinions of the report Office of the people's Government of Hebei Province on deepening the innovation and entrepreneurship reform of colleges and universities [9], which are mainly macro plans and have little relevance to the colleges and universities in Hebei Province. The guiding policy opinions should comprehensively consider the basic situation of colleges and universities and regional economy, We will formulate an incentive system in line with the province and its universities, guide universities and enterprises to form a joint force, and promote the cultivation of innovative and entrepreneurial talents in universities.

4. Conclusion

As a new talent training paradigm, the cultivation of undergraduates' innovation and entrepreneurship ability is not a temporary need, but a long-term need [16]. In order to cultivate the innovation and entrepreneurship ability of undergraduates in colleges and universities, it is necessary to build a comprehensive cooperative education mechanism among schools, enterprises and the government, to form a cooperative education atmosphere is the only method to fundamentally deal with the problems existing in the cultivation of innovation and entrepreneurship ability of undergraduates. Combine undergraduate innovation and entrepreneurship learning with their own learning, and integrate innovation and entrepreneurship awareness into students' lifelong learning goals. Only by grasping the law of

innovation and entrepreneurship education, giving full play to the innovative functions of government and higher education, and mobilizing the enthusiasm of enterprises, teachers and students, can we cultivate high-quality talents required by the society and achieve the goal of educating people for the party and the country.

Acknowledgements

This paper is one of the phased achievements of the second batch of Hebei New Engineering Research and Practice Project: "Research on training mode of measurement and control technology and instrument professionals for intelligent production" (2020GJXGK002) and the Hebei Higher Education Teaching Reform Research and Practice Project: Research on the practical ability training mode of measurement and control technology and instrument professionals based on the engineering real scene Laboratory (2020GJJG012).

References

- [1] Z. Y. Deng, F. R. Zhong, and D. H. Hong, "Cultivation strategy of Undergraduates' innovation and entrepreneurship ability under the background of "breaking five virtues", Educational Observation, vol. 10, 2021, pp. 529–551.
- [2] Y. Zhu, Q. X. Xu, "Research on entrepreneurship and innovation ability development of Undergraduates in Guangxi part two: Research on Optimizing Teachers' teaching behavior and improving innovation and entrepreneurship ability of Undergraduates", Journal of Guangxi Normal University for Nationalities, vol. 37, 2020, pp. 96–99.
- [3] F. Jin and F. Wang, "The exploration of "tutorial system" model on the cultivation of undergraduate innovation and entrepreneurship ability," Education and Teaching Forum, vol. 3, 2021, pp. 21–24.
- [4] J. X. Bai, L. Y. Jia, and L. Hao "Research on the training mode of promoting the innovation and entrepreneurship ability of students in food discipline through the combination of production, study and research -- Taking the school of food science and engineering of Shanxi Agricultural University as an example," University Education, vol. 6, 2021, pp. 189–191.
- [5] S. H. Xu, "Research on government support in school enterprise cooperation," Journal of Higher Education, vol. 9, 2021, pp. 59–60.
- [6] M. Cao, "On the training mode of innovative and entrepreneurial talents in Application-oriented Universities," Chinese University Teaching, vol. 15, 2011, pp. 20–20.
- [7] H. Y. Zhong, "Research on the curriculum system of "integrated" innovation and entrepreneurship education in Colleges and Universities," Journal of Qiqihar Teachers College, vol. 4, 2016, pp. 122–124.
- [8] P. Y. Li, "Thoughts on integrating innovation and entrepreneurship education into the whole process of talent training," Innovation and Entrepreneurship Education, vol. 4, 2013, pp. 31–33.

- [9] Y. Zhou, Y. Wang, "Research on the current situation, problems and Countermeasures of innovation and entrepreneurship education in Colleges and universities in Hebei Province," *Journal of Hebei Agricultural University (agriculture and Forestry Education Edition)*, vol. 20, 2018, pp. 1–4.
- [10] S. Z. He, W. J. Ding, "Research on the construction of the platform for improving the practical ability of College Students' Entrepreneurship and Innovation Education -- a case study of Yi wu vocational and Technical College of industry and Commerce," *Journal of Hubei Polytechnic Institute*, vol. 22, 2019, pp. 36–39.
- [11] Y. S. Wei, "Construction and practice of the teaching mode of "learning plan guidance and independent inquiry", *Academic papers on educational exploration and practice in 2015*, pp. 37–38.
- [12] Y. Geng, W. J. Shen, and X. Q. Pei, "Discussion on the diversification of college curriculum assessment mode," *Guangdong chemical industry*, vol. 41, 2014, pp. 241–242.
- [13] H. Ji, Y. A. Gu, and G. H. Zhang, "Exploration on innovation and entrepreneurship education from the perspective of Applied Talents Training," vol. 4, 2016, pp. 77–80.
- [14] X. H. Shao, L. Liu, and C. M. Li, "Cultivation and promotion of students' practical ability based on school enterprise cooperation mode," *Educational Modernization*, vol. 5, 2018, pp. 27–28.
- [15] Y. L. Mou, K. J. Li, and J. J. Li, Promoting the Program Cluster Construction of the Application-Oriented College by Industry-Education Integration, vol. 3, 2021, pp. 42–50.
- [16] D. Yang "The Meta-Hypothesis, Internal Logic and Systematic Strategy of the Curriculum Construction of University Innovation and Entrepreneurship Education," *Forum on Contemporary Education*, vol. 4, 2022. <https://doi.org/10.13694/j.cnki.ddjylt.20220424.001>