

A Review of the Research on the Quality Evaluation of Innovation and Entrepreneurship Education in Colleges and Universities

Zejiang Zhou^{a,*}, Li Han^b

School of economics, Anhui University of Finance and economics, Bengbu, Anhui, China

^{a,*}aczzj123456@163.com, ^b1556628522@qq.com

Abstract

Innovation and entrepreneurship education has become a hot topic in Colleges and universities, and the quality evaluation of innovation and entrepreneurship education has also become the focus of academic research. Through the literature method, this paper sorts out and analyzes the Chinese literature on the quality evaluation of innovation and entrepreneurship education collected by CNKI in the past 20 years, and briefly classifies and analyzes the research results of domestic scholars on the quality evaluation of innovation and entrepreneurship education in Colleges and universities. Starting from the connotation of innovation and entrepreneurship education, this paper summarizes the quality evaluation system, research methods and research model of innovation and entrepreneurship education, and puts forward some suggestions. The shortcomings are pointed out for the reference of subsequent scholars.

Keywords

Innovation and Entrepreneurship Education; Evaluation Index System; Method and Model.

1. Introduction

Since the ministry of education first launched the pilot work of innovation and entrepreneurship education in nine domestic universities in 2002, innovation and entrepreneurship education has gone through more than ten years of development. In 2015, Premier Li Keqiang pointed out that in the first China Internet plus student innovation and entrepreneurship competition, university students are the main force in implementing the innovation driven development strategy and promoting the public entrepreneurship and the innovation of the masses. We should not only learn more and learn more, but also devote ourselves to innovation and innovation, and improve our practical ability. Universities have started to invest more in innovation and entrepreneurship education. Nowadays, innovation and entrepreneurship education has been carried out in colleges and universities, but the education quality level is not uniform. Therefore, it is necessary to evaluate the quality of innovation and entrepreneurship education in China, effectively analyze the practical effect of the development of innovation and entrepreneurship education in colleges and universities, and then guide the innovation and entrepreneurship education in colleges and universities to improve. In recent years, research on the quality evaluation of innovation and entrepreneurship education has sprung up. Based on a comprehensive understanding of the status quo of the research on the quality evaluation of innovation and entrepreneurship education, this paper analyzes the shortcomings of the research on the quality evaluation of innovation and entrepreneurship education, and makes a modest contribution to the further in-depth study of the academic community.

2. The Connotation of Innovation and Entrepreneurship Education

In May 2010, the Ministry of education of the people's Republic of China promulgated the opinions on vigorously promoting innovation and entrepreneurship education in colleges and universities and college students' independent entrepreneurship work, which formally put forward the concept of "innovation and entrepreneurship education". Once the concept was put forward, it has aroused widespread debate in the academic circles, because before the concept was put forward, there were two concepts of innovation education and entrepreneurship education. There are three kinds of innovation in the academic field.

The theory of single tendency. Zeng Yingshui (2009) stressed that innovation and entrepreneurship education is mainly a new type of education which takes both innovation education and entrepreneurship education into consideration and focuses on entrepreneurship education. In fact, he tends to equate innovation and entrepreneurship education with entrepreneurship education [1]. Li Renjie (2010) also preferred entrepreneurship education in his understanding of innovation and entrepreneurship education. He believed that innovation and entrepreneurship education is "a kind of conscious and positive psychological preparation formed by understanding entrepreneurship." [2]

Dialectical relationship theory. Innovation education, entrepreneurship education and innovation and entrepreneurship education are several conspectus that have appeared successively, and the three conspectus are closely related. Some scholars have discussed the dialectical relationship between the three. Gao Xiaojie and Cao Shengli (2007) believed that innovation education and entrepreneurship education have the same goal orientation and the same effect, but the former focuses on the development of thinking while the latter focuses on the cultivation of ability [3]. Lei Jiexiang (2008) believed that innovation education and entrepreneurship education are consistent, and innovation and entrepreneurship education should be studied as a whole concept [4]. Yu Jianxiu (2012) introduced the connotation of innovation education, entrepreneurship education and innovation and entrepreneurship education from the perspective of time development context. He believed that entrepreneurship education was developed on the basis of innovation education, and innovation and entrepreneurship education was developed on the basis of entrepreneurship education [5].

The theory of universal synthesis. In recent years, the academic research and discussion on the connotation of innovation and entrepreneurship education gradually changed the narrow thinking of innovation education or entrepreneurship education itself, and began to understand innovation and entrepreneurship education from a higher perspective. Liu Jun (2016) believed that innovation and entrepreneurship education is not a simple combination of innovation education and entrepreneurship education, but an expansion education of employment education. Innovation and entrepreneurship education aims to cultivate students' innovative spirit and entrepreneurial consciousness, not only to teach students how to innovate and create, but also to teach students how to practice [6]. Lei Siwei (2017) believed that innovation and entrepreneurship education should not only cultivate the innovative consciousness, thinking and concept of the educated, but also improve the entrepreneurial skills and entrepreneurial ability of the educated, so as to promote employment through entrepreneurship. Innovation and entrepreneurship education is not only a quality education, but also a vocational education [7]. Qi Jiachao (2020) thought that innovation and entrepreneurship education is to cultivate students' innovative thinking, entrepreneurial spirit and entrepreneurial ability from the characteristics of situational, open, interdisciplinary and interdisciplinary characteristics [8]. Generally speaking, innovation and entrepreneurship education involves two aspects of quality and occupation, which aims to cultivate students' innovative spirit, entrepreneurial consciousness and innovative ability, pay attention to practice and stimulate students'

creativity. Generally speaking, innovation and entrepreneurship education involves two aspects of education content: quality and occupation, in order to cultivate students' innovative spirit, entrepreneurial consciousness and innovative ability, pay attention to practice and stimulate students' creativity [9].

3. The Evaluation Index System of Innovation and Entrepreneurship Education Quality

The establishment of the index system is the premise and basis for predicting and evaluating the quality of innovation and entrepreneurship education. According to the abstract nature and characteristics of innovation and entrepreneurship education, the index system can be decomposed into behavioral and operable structures. Therefore, the construction of index system plays an extremely important role in the evaluation of the quality of innovation and entrepreneurship education. Of course, the selection of scientific and appropriate indicators is the basis of objective evaluation, and the principle of index selection will be the prerequisite for the establishment of index system.

We summarize the existing literature and find that the content of innovation and entrepreneurship education quality evaluation index system is generally divided into three steps: top-level design, level by level expansion and classification research. The top-level design is to evaluate the quality of entrepreneurship education; Level by level expansion is an index system. Generally, it needs to set two or three levels of analysis. The first and second level indicators are abstract generalizations, and the third level indicators are specific indicators; Classification research refers to the subdivision within the same index level according to the research needs. Combined with relevant literature, we summarize the evaluation indicators of innovation and entrepreneurship education quality into three levels, namely, social level indicators, university level indicators and student level indicators.

Social level indicators. The secondary classification of social indicators includes national policy, enterprise support and social reputation, which is mainly based on the external support and feedback of innovation and entrepreneurship education. The national preferential policies for university entrepreneurship include the national investment in entrepreneurship and innovation policies [10]. Enterprise support includes the demonstration role of enterprises, the support of public welfare projects, the number of posts and practice bases provided by enterprises, the investment of social organizations, and school-enterprise cooperation projects [11, 12]. Social reputation includes the degree of unit reuse, the success rate of students' entrepreneurship, and the social recognition of school innovation and entrepreneurship education [13].

University level indicators. The secondary classification of university level indicators includes teachers, school running philosophy, environmental atmosphere, system construction and curriculum, which is based on the teaching conditions of innovation and entrepreneurship education on campus. Teachers include teachers' personal teaching and research achievements, teaching methods, the proportion of people with higher education background, the proportion of senior professional titles, professional knowledge, and teachers with entrepreneurial experience [14,15]. School running philosophy includes innovation and entrepreneurship education, teaching planning, innovation and entrepreneurship base [16]. The environmental atmosphere includes the spirit of the school, the number of innovation and entrepreneurship forums, the number of seminars, the number of entrepreneurial associations, publicity reports, and the number of successful entrepreneurs to share their entrepreneurial experiences [17, 18]. The system construction includes the scientificity, rationality and incentive policy of innovation and entrepreneurship education and performance evaluation [19]. The curriculum includes the

class hours of practice courses, the rate of core courses, the proportion of entrepreneurs' visiting speeches in class hours, and the credit setting [20].

Student level indicators. The secondary classification of student level indicators includes professional quality and psychological quality, which is the evaluation of individual innovation and entrepreneurship competency of students. Professional quality includes the effect of course learning, innovation and entrepreneurship practice effect, transformation rate of scientific research achievements, award-winning level and times of innovation and entrepreneurship competition, invention patents and number of published papers [21]. Psychological quality includes entrepreneurial consciousness, strong willpower and risk tolerance [22].

4. Model and Method of Quality Evaluation of Innovation and Entrepreneurship Education

The quality evaluation of innovation and entrepreneurship education is the core issue of innovation and entrepreneurship education, and the key link of evaluation is the selection of evaluation index and evaluation model and method. With more and more research on the quality evaluation of innovation and entrepreneurship education, the evaluation model and method also has a certain development and progress.

In the early stage, Huang Zhichun and Liu Biqian (2007) proposed to use the analytic hierarchy process (APH) based on the scientific principles, directional principles, incentive principles, dynamic principles and operational principles, but did not build an evaluation index system [13]. Later, Gao Xi (2015) and others constructed the evaluation index system of innovation and entrepreneurship education in Colleges and universities from the social, school and student levels by combining subjective indicators with objective indicators, macro indicators and micro indicators, using the analytic hierarchy process (AHP) method.

Since the traditional AHP method needs to build a judgment matrix, and the consistency test of the judgment matrix is a difficulty, Gao Gao and Hua jucui (2015) improved the AHP method, simplified the traditional operation method, and constructed the judgment matrix with a more intuitive three-scale method, avoiding the consistency test of the judgment matrix and the complex adjustment process [23]. Although the consistency test problem of judgment matrix is solved in the improved AHP method, it relies too much on the experience of a single expert. Because multiple experts have different judgments on the same problem, they will produce different weight coefficients. At the same time, if there are too many evaluation indexes, the accuracy of judgment matrix will be greatly reduced, which will directly affect the accuracy of AHP method. Li Xuhui (2016) and others introduced group G1 method to evaluate the quality of innovation and entrepreneurship education, which effectively solved the defects of AHP method [24].

A single evaluation method will make the evaluation results not accurate enough, so some scholars build the evaluation model of innovation and entrepreneurship education quality by integrating various evaluation methods. Qin Jingmin (2009) built the DEA (Data Envelopment Analysis) - AHP (analytic hierarchy process) - FAHP (fuzzy analytic hierarchy process) evaluation system model based on QFD theory [25]. Wang Shi and Chen Xi (2018) combined the advantages of analytic hierarchy process (AHP) and fuzzy comprehensive evaluation (FCE) to build a "differential evaluation model" [26]. However, these models can only adapt to the simplified index system and need further optimization for the complex index system. Yan Yongsai (2020) constructed a BP neural network model to evaluate the quality of innovation and entrepreneurship education by using neural network, which can be based on the laws of functions and the characteristics of scientific and reasonable analysis of complex problems [27]. However, Yan Yongsai's BP neural network model only analyzes students, and the integrity of evaluation is not perfect. Xu Xiaozhou (2019) selects evaluation indicators by theoretical

sampling method, covering multiple social sectors and relevant groups, and constructs VPR three-dimensional three-level evaluation model from three dimensions of value evaluation, process evaluation and result evaluation, reflecting the characteristics of innovation and entrepreneurship education with multi-level, multiple and multi methods [28].

5. Conclusion

Looking at the existing literature research, we find that in the early 20th century, there are relatively few literatures on the quality evaluation of innovation and entrepreneurship education. In recent years, the literature on the quality evaluation of innovation and entrepreneurship education is increasing year by year. From the perspective of research content, it is more and more abundant, and from the depth and breadth of research, it should be more in-depth and more extensive. At present, there are still some deficiencies in the research on the quality evaluation of innovation and entrepreneurship education in domestic colleges and universities

Firstly, although many scholars have made continuous improvement on the evaluation system of innovation and entrepreneurship quality, they pay too much attention to theoretical analysis and neglect practical analysis, which leads to the quality evaluation system in a vacuum state and has not yet formed a scientific, systematic and practical evaluation system. Secondly, due to the lag of the evaluation of the quality of innovation and entrepreneurship education, there is little research on the feedback indicators of the evaluation of innovation and entrepreneurship education. Thirdly, the evaluation index lacks the evaluation of the third party. Students will be a member of the society in the future. Their performance in social work and their adaptation to the society will be the evaluation basis for the quality of innovation and entrepreneurship education in Colleges and universities. Most of the research literature takes universities as the evaluation subject, and the evaluation subject is single. Fourthly, the evaluation index ignores the subjectivity of students. Students are the core of the quality evaluation of innovation and entrepreneurship education in Colleges and universities, and the quality of students' learning process and talent cultivation is the core standard for evaluating the quality of Education [29].

When the follow-up scholars carry out research on the quality evaluation of innovation and entrepreneurship in colleges and universities, they can improve from the following aspects: (1) Fully analyze the key factors and influencing mechanism of the evaluation results of innovation and entrepreneurship education quality, deeply excavate data and manage data, and improve the practicability of the evaluation system. (2) Establish a set of tracking, evaluation and feedback mechanism from students' enrollment, education and study to graduation, and then to entrepreneurship or work, to record the changes of students' achievements in this period and the impact on society, and feed back the indicators obtained to the quality evaluation of innovation and entrepreneurship education. (3) Third parties are encouraged to enter the evaluation team, including but not limited to parents, employers and government departments. Parents and social employers are mainly the result of undertaking innovation and entrepreneurship education. (4) The purpose of innovation and entrepreneurship education is to cultivate students with innovative consciousness, entrepreneurial quality and entrepreneurial ability. In the evaluation process, the focus should be shifted from the external factors such as university resources and reputation to the students' main body, and pay attention to the development of students.

Acknowledgements

This work is supported by the project of Provincial Quality Engineering Project of Colleges and Universities in Anhui Province (Grant No: 2018jyxm1404).

References

- [1] S.Y.Zeng. Innovation and entrepreneurship education: a new content of the development of contemporary higher education in China -- an analysis of the debate on the connotation and relationship theory of innovation and entrepreneurship education in China. Heilongjiang Education (Research and Evaluation of Higher Education), (2009)No.10,p.7-8.
- [2] R.J.Li, W.J.Shang. Analysis of the connotation and significance of innovation and entrepreneurship education of college students. Science and Technology Innovation Guide, (2010)No.9,p.245-246.
- [3] X.J.Gao, S.L.Cao. Innovation and entrepreneurship education - training pioneers of new era career - Summary of seminar on innovation and entrepreneurship education of Chinese Higher Education Association. Research on Chinese Higher Education, (2007)No.7,p.91-93.
- [4] J.Y.Lei. Responsibility of entrepreneurship economy, innovation and entrepreneurship education and University. China Vocational Education Society, (2008)p.110-115.
- [5] J.X.Yu. The essence and countermeasures of innovation and entrepreneurship education in colleges and universities. Hebei Enterprises, (2012)No.9,p.81-83.
- [6] J.Liu. The connotation, problems and reform path of "innovation and entrepreneurship" education in Colleges and universities. Journal of Higher Education, (2016)No.10,p.31-32.
- [7] S.W.Lei. Problems and countermeasures of innovation and entrepreneurship education in Colleges and universities -- starting from the connotation of innovation and entrepreneurship education. Henan Education (Higher Education), (2017)No.6,p.126-128.
- [8] J.C.Qi. The connotation, dilemma and outlet of innovation and entrepreneurship education in Colleges and universities from the perspective of "subject specialty industry chain". Education Observation, Vol.,9 (2020)No.14,p.86-87.
- [9] B.Zhang,H.Bai. The distinction between the concept of "innovation and entrepreneurship education in Colleges and universities". Exploration of Higher Education, (2014)No.4,p.48-52.
- [10] Y.L.Li, H.J.Ma. Research on the selection of evaluation indicators of innovation and entrepreneurship education in Colleges and universities. Education and Teaching Forum, (2018) No. 40,p.23-24.
- [11] X.Gao, W.C.He,X. Yang. Research on the construction of evaluation index system of innovation and entrepreneurship education in Colleges and Universities -- Based on the international evaluation theory of innovative talents. Science and Education Literature, (2015)No.12,p.4-5.
- [12] Y.Xu, H.Bai. Performance evaluation of innovation and entrepreneurship education in Colleges and universities. Innovation and Entrepreneurship Education,Vol.5(2014)No.2,p.29-33.
- [13] Z.C.Huang, B.Q.Liu. Thinking about the construction of evaluation system of innovation and entrepreneurship education for vocational students. Education and Occupation, (2007)No.30,p.78-79.
- [14] X.Y.Zhang. Research on the index system of innovation and entrepreneurship education quality evaluation under big data. Management Observation, (2019)No.35,p.153-156.
- [15] T.Hong. The construction of the evaluation system of innovation and entrepreneurship education in applied undergraduate colleges. Journal of Qiqihar University, (2015)No.11,p.145-147.
- [16] S.Q.Hu. Evaluation of innovation and entrepreneurship education in colleges and universities based on improved AHP fuzzy comprehensive evaluation method. Education Modernization, Vol.3 (2016)No.22,p.75-77+80.
- [17] X.M.Liu, H.J.Liu,C.J. Liang. Construction of evaluation system of innovation and entrepreneurship education in colleges and universities. China Economic and Trade Guide (theoretical Edition), (2017)No.20,p.77-78.
- [18] Z.P.Bian. Research on performance evaluation index system of innovation and entrepreneurship education in applied universities. Journal of Liaoning University of Science and Technology,Vol.18 (2016)No.5,p.96-98.
- [19] Y.J.Dong. Research on the construction of evaluation index system of innovation and entrepreneurship education in colleges and universities. Think Tank Era, (2018)No.33,p.241-242.

- [20] Y.F.Feng,X.L.Tong. Evaluation model and method of innovation and entrepreneurship education quality in research university. Journal of Huazhong Agricultural University, (2013)No.1,p.122-128.
- [21] D.B.Dong. A study on the evaluation system of innovation and entrepreneurship,p.education in colleges and universities based on the analytic hierarchy process evaluation model. Education Modernization,Vol.5 (2018)No.29,p. 23-25.
- [22] Z.Z.Liu. Research on the behavior evaluation system of innovation and entrepreneurship education in higher physical education institutions. Journal of Nanjing Institute of Physical Education,Vol.23 (2009)No.2,p.99-103.
- [23] K.Gao, J.C.Hua. Evaluation of innovation and entrepreneurship education in Colleges and Universities Based on Improved AHP. Modern Education Management, (2015)No.4,p.61-64.
- [24] X.H.Li, X.M.Hu. Research on the evaluation system of innovation and entrepreneurship education in colleges and universities based on the analysis of group G1 method. Research on Educational Development, ,Vol.36 (2016)No.21,p.29-36.
- [25] J.M.Qin. Research on the quality evaluation of entrepreneurship education in colleges and universities based on QFD . Tianjin University, 2010.
- [26] S.Wang , X.Chen. Evaluation and application of innovation and entrepreneurship education in higher vocational colleges based on "differential evaluation model". Journal of Wuxi Vocational and Technical College,Vol.17 (2018)No.2,p.5-10.
- [27] Y.S.Yan. Evaluation of computer students' innovation and entrepreneurship education based on BP neural network . Jiangxi Normal University, (2020).
- [28] X.Z.Xu. VPR structure model of innovation and entrepreneurship education evaluation. Education Research,Vol.40 (2019)No.7,p.83-90.
- [29] J.H.Xu,H.J. Zhao, X.L.Liu. A study on the quality evaluation index system of innovation and entrepreneurship education in colleges and universities "student centered". Hei Long Jiang Animal Husbandry and Veterinary Medicine, (2018)No.9,p.230-232.