

The Quality Evaluation System of Innovation and Entrepreneurship Education in Colleges and Universities

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ABSTRACT

Promoting innovation and entrepreneurship education is an important measure to deepen the reform of education and teaching in colleges and universities and improve the quality of talent training. Systematic research on the quality evaluation system of innovation and entrepreneurship education in colleges and universities is conducive to promoting the sustainable and stable development of innovation and entrepreneurship education in colleges and universities. According to research on the literature, this study established an evaluation indices system based on CIPP model for the quality of college innovation and entrepreneurship education, which mainly included four main indices: environmental foundation, resource allocation, process action, and performance.

Keyword: *Colleges and universities; Innovation and entrepreneurship; Education; CIPP model; Evaluation system*

1. INTRODUCTION

Deepening the reform of innovation and entrepreneurship education in colleges and universities is an urgent need for China to implement innovation-driven development strategies and promote economic quality and the upgrades of efficiency. Besides, it is an important measure to promote comprehensive reform of higher education and promote higher-quality entrepreneurship and employment for the graduates of colleges and universities. At present, innovation and entrepreneurship education, as a brand-new educational concept and education model, it has been widely carried out in colleges and universities across the country. On the other side, the evaluation of colleges and universities education's quality is a vital link for continuous improvement of education quality. How to evaluate and improve the quality of innovation and entrepreneurship education in colleges and universities has become the focus and difficulty of current theoretical research on innovation and entrepreneurship education. A reasonable evaluation of the quality of innovation and entrepreneurship education in colleges and universities is a relatively complex systematic project. So far, China has not established a relatively complete quality evaluation system for innovation and entrepreneurship education in colleges and universities[1]. The systematic research on the quality evaluation system of innovation and entrepreneurship education of colleges and universities has very important practical significance and far-reaching impact on ensuring the continuous, stable and healthy development of entrepreneurship education of colleges and universities [2].

2. EVALUATION TARGET OF INNOVATION AND ENTREPRENEURSHIP EDUCATION IN COLLEGES AND UNIVERSITIES

In the 21st century, innovation and entrepreneurship education has become a new task and subject of higher education. The 17th National Congress of the Communist Party of China proposed "improve independent innovation capabilities and build an innovative country" and "promoting entrepreneurship to drive employment" thus to propose the task of cultivating innovative and entrepreneurial talents for higher education. The State Council and the Ministry of Education have successively issued documents to vigorously promote the innovative and entrepreneurial education in colleges and universities and the independent entrepreneurship of students in colleges and universities. Therefore, universities must clarify what the goals of innovation and entrepreneurship education are.

The evaluation indices system for the quality of innovation and entrepreneurship education in colleges and universities is to determine specific evaluation indices that can reflect the quality of education in accordance with the evaluation targets of innovation and entrepreneurship education of colleges and universities[3]. This study used the method of literature research to define the goals of innovation and entrepreneurship education in colleges and universities while used the Delphi method to build a quality evaluation system for colleges and universities' innovation and entrepreneurship education under the CIPP perspective,

and finally set the weights of evaluation indices of the colleges and universities' innovation and entrepreneurship education quality through the analytic hierarchy process, thereby establishing a systematic, scientific, and highly operable quality evaluation indices system for innovation and entrepreneurship education of colleges and universities.

Innovation and entrepreneurship are two concepts that are both connected and different from each other. Innovation is a conceptualization process characterized by new thinking, new inventions and new descriptions. Entrepreneurship is the process of creating valuable new things or careers through innovative practices. In essence, innovation is the premise and foundation of entrepreneurship and entrepreneurship is a special form of innovation. From the perspective of extension, innovation covers a wide range which includes almost all fields. Comparatively, entrepreneurship mainly refers to the establishment and operation of enterprises. From the perspective of objectives, innovation education is a national strategy and seeks development while entrepreneurship education is the application of innovation in practice and an effective way to relieve employment pressure and solve employment problems. Consequently, in the process of innovation and entrepreneurship education of colleges and universities, it should put forth effect on cultivating students' innovative spirit and ability to ensure the correctness of the direction of innovation and entrepreneurship education.

3. THE PRINCIPLES OF CONSTRUCTING THE QUALITY EVALUATION INDICES SYSTEM OF INNOVATION AND ENTREPRENEURSHIP EDUCATION OF COLLEGES AND UNIVERSITIES BASED ON CIPP MODEL

3.1. The principle of combining process evaluation indices and result evaluation indices

CIPP evaluation focuses on the formative and improving functions of the evaluation. "The most important purpose of evaluation is not to prove, but to improve" (Staffer Beam). The innovation and entrepreneurship education in various colleges and universities is undergoing profound changes to adapt to the reform of the talent training model. At the same time, due to different environmental resource backgrounds, the improvement plan of the innovation and entrepreneurship education quality of each college and university is various. Accordingly, with the help of the combination of process and result evaluation of the CIPP model, it can meet the needs of continuous optimization

and improvement of the quality of innovation and entrepreneurship education in colleges and universities.

3.2. The principle of combining objective evaluation indices and subjective evaluation indices

In the CIPP-based quality evaluation system of innovation and entrepreneurship education, subjective evaluation indices and objective evaluation indices should be fully considered in the background evaluation, input evaluation, process evaluation and outcome evaluation[4]. According to the availability of evaluation data, an evaluation method with objective evaluation as the main and subjective evaluation as a supplement is more conducive to operation. Therefore, the combination of objective evaluation indices and subjective evaluation indices are in favour of the establishment of a scientific evaluation system.

3.3. The principle of combining teaching evaluation indices and practice evaluation indices

The teaching evaluation indices of innovation and entrepreneurship education in colleges and universities refers to the value judgment standard and rational evaluation carrier used in the entrepreneurial process such as theoretical teaching and professional subject courses[5]. In addition, the indices of innovation and entrepreneurship education's practice of colleges and universities refer to the value judgment standard and rational evaluation carrier used to enhance the innovation and entrepreneurship ability of colleges and universities students in entrepreneurship practice. In the process of considering the evaluation indices of innovation and entrepreneurship education in colleges and universities, it is necessary to introduce teaching evaluation indices including a number of innovation and entrepreneurship courses and proportion of students who choose innovation and entrepreneurship courses as their electives in the whole school and take into account the number of projects approved by various types of entrepreneurship plans at all levels and innovation and entrepreneurship training rooms, science and technology parks, pioneer park, and a number of incubators and other practical evaluation indices to promote a fully inclusive and equitable theoretical teaching and practical exploration of innovation and entrepreneurship education in colleges and universities.

4. THE SELECTION AND SYSTEM CONSTRUCTION OF THE QUALITY EVALUATION INDICES OF INNOVATION AND ENTREPRENEURSHIP EDUCATION OF COLLEGES AND UNIVERSITIES BASED ON CIPP MODEL

4.1. The system construction of the quality evaluation indices of innovation and entrepreneurship education of colleges and universities based on CIPP model

This project selected more than 10 experts who had been engaged in innovation and entrepreneurship education research as both of full-time and part-time teachers for more than 3 years and innovation and entrepreneurship education managers for investigation. As a result, combining the research results of domestic and foreign experts after multiple rounds of investigation and repeated screening, it finally established a CIPP model-based evaluation indices system for the level of entrepreneurship education in colleges and universities according to the relevant theories of the CIPP model, including 4 first-level indices, 12 second-level indices, and 22 three-level indices, which are presented as Figure 1[6].

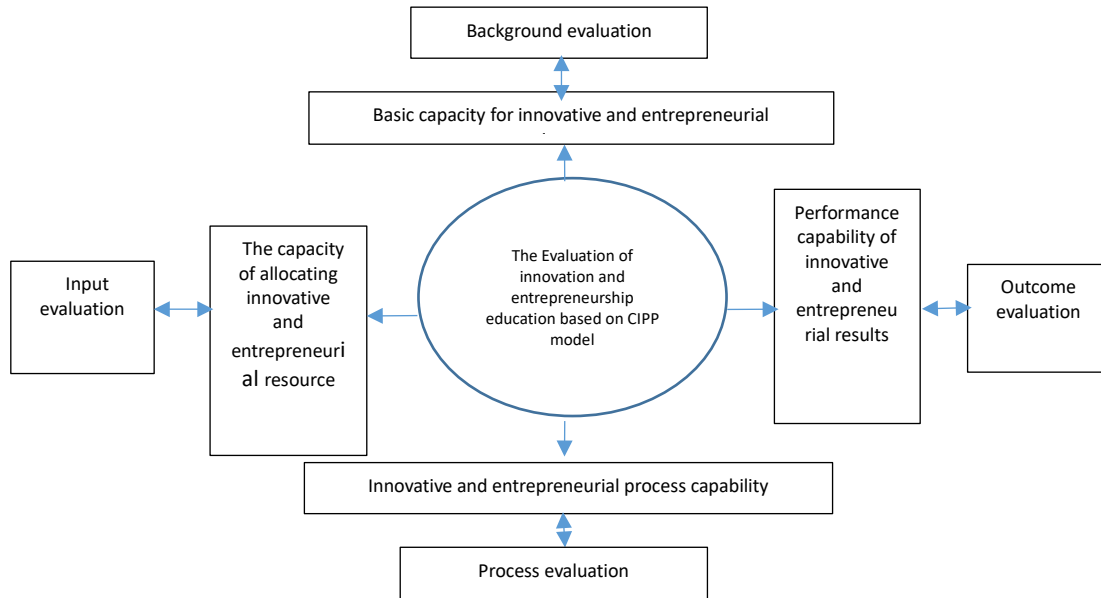


Figure 1. The evaluation model of the entrepreneurial education level of colleges and universities

The evaluation indices system for the level of innovation and entrepreneurship education in colleges and universities mainly includes four main indices: environmental basic capability, the capacity of allocating resource, the ability of

process action, and performance ability. Each main indicator includes several secondary and tertiary indices, which are presented in Table 1

Table 1. The evaluation indices system of entrepreneurship education level of colleges and universities

Main Indices	Second-level Indices	Three-level Indices	Evaluation Method
Background Evaluation The Basic Capacity for Entrepreneurial Environments	Regional environment (A1)	The active degree of entrepreneurial activities in the city where the colleges and universities are located (B1)	Expert evaluation
	Top-level design (A2)	Integrate innovation and entrepreneurship education into school development planning (B2)	Expert evaluation
		The training program reflects the concept of facing all students (B3)	Expert evaluation
	Technical foundation (A3)	The number of granted invention patents (B4)	Objective measurement
		The number of signed technology transfer contracts (B5)	Objective measurement

Input Evaluation The Capacity of Allocating Innovative and Entrepreneurial Resource	Teacher input (A4)	The number of double-qualified teachers in entrepreneurship education (B6)	Objective measurement
		Proportion of teachers who teaches entrepreneurship education with senior professional titles (B7)	Objective measurement
		Proportion of teachers who teach entrepreneurship education with high academic qualifications (B8)	Objective measurement
	Funding (A5)	Financial allocations for innovation and entrepreneurship education (B9)	Objective measurement
		Financial allocations for innovation and entrepreneurship education of colleges and universities (B10)	Objective measurement
		Organizational guarantee (A6)	The number of business consulting and guidance service centers (B11)
Process Evaluation Entrepreneurial Process Capability	Entrepreneurship courses (A7)	The number of entrepreneurship education courses (B12)	Objective measurement
		The proportion of students who choose innovation and entrepreneurship courses as their electives in the whole school(B13)	Objective measurement
	Entrepreneurship projects (A8)	The number of projects approved by various types of entrepreneurship plans at all levels (B14)	Objective measurement
		The proportion of students who participate in various innovation and entrepreneurship projects (competitions) in the whole school (B15)	Objective measurement
Practice platform (A9)	The number of innovation and entrepreneurship training rooms, science and technology parks, pioneer park, and incubators (B16)	Objective measurement	
Outcome Evaluation Performance Capability	Literacy improvement (A10)	The number of awards in national undergraduates entrepreneurship plan competitions (B17)	Objective measurement
		The improvement of colleges and universities students' entrepreneurial psychological characteristics (B18)	Objective measurement
	Entrepreneurial effect (A11)	The proportion of students who start their own businesses on their own in school (B19)	Objective measurement
		Cumulative number of incubating companies in science and technology parks, pioneer park, and incubators in colleges and universities (B20)	Objective measurement
	Social benefit (A12)	Ratio of entrepreneurial rate to employment rate (B21)	Objective measurement
		The number of outstanding entrepreneurial alumni (B22)	Objective measurement

mainly measured by the active degree of entrepreneurial activities in the city where the colleges and universities are located.

Top-level design: In the top-level design, whether colleges and universities integrate innovation and entrepreneurship education into school development plans and training programs to reflect the concept of facing all students is an important factor to restrict the effectiveness of innovation and entrepreneurship education in colleges and universities.

Technical basis: The technical basis of colleges and universities includes the number of granted invention patents and the number of signed contracts for technology transfer. As a vital manifestation of the innovation ability of colleges and universities, the amount of invention patent grants reflects the innovation ability of teachers and students of colleges and universities while the signing of technology transfer contracts reflects the ability of transforming science and technology which belongs to teachers and students in colleges and universities.

4.2. Evaluation of indices explanation

4.2.1. Background evaluation - basic ability indices of entrepreneurial environment

Background evaluation refers to the evaluation of needs, problems, resources, and opportunities in a specific environment. It is essentially a diagnostic evaluation of program objectives.

Regional environment: The social environment in which colleges and universities are located affects entrepreneurial activities and entrepreneurship education in colleges and universities. Besides, the active level of regional environmental innovation and entrepreneurship activities directly affects the development and effect of entrepreneurship education in colleges and universities. The evaluation indices of the regional environment are

4.2.2. Input evaluation - ability indices of entrepreneurship resource allocation

Input evaluation is stated for the evaluation of the resources, tools, methods that are needed and possible to obtain. In essence, it is the feasibility evaluation of the implementation plan.

Teacher input: The teacher input in the allocation of entrepreneurial resources in colleges and universities is mainly measured by three indices: the number of double-qualified teachers in entrepreneurship education, the proportion of teachers in entrepreneurship education with senior titles, and the proportion of teachers in entrepreneurship education with high academic qualifications. Firstly, the number of double-qualified teachers in entrepreneurship education refers to the number of teachers who have both theoretical foundations and practical experience in enterprises. Secondly, the proportion of teachers with senior professional titles in entrepreneurship education refers to the proportion of entrepreneurial teachers with senior professional titles and deputy senior professional titles to the total number of teachers of entrepreneurship education. Lastly, the proportion of teachers who are in charge of entrepreneurship education with high academic qualifications means the proportion of teachers of entrepreneurship education with a doctoral degree.

Funding investment: Innovation and entrepreneurship education in colleges and universities requires a large amount of funding investment. The funding sources of entrepreneurship education include the educational and financial allocations for innovation and entrepreneurship education and funds for innovation and entrepreneurship education which is appropriated by colleges and universities. In addition, all levels of government financial appropriation, social angel investment, national appropriation for national innovation and entrepreneurship training programs, and school-enterprise cooperation funds can all be regarded as external innovation and entrepreneurship education funds for colleges and universities. The funding for innovation and entrepreneurship education in colleges and universities mainly includes innovation and entrepreneurship teaching and scientific research investment, funds for entrepreneurial activities, and innovation and entrepreneurship project funding and so on.

Organization guarantee: The organization guarantee for innovation and entrepreneurship in colleges and universities is mainly reflected in the number of entrepreneurial consulting and guidance service centers. Institutions engaged in training, consulting, and guidance for innovation and entrepreneurship education in colleges and universities including innovation and entrepreneurship colleges, entrepreneurship guidance centers, and innovation and entrepreneurship associations.

4.2.3. Process evaluation - ability indices of entrepreneurship process

Process evaluation refers to the supervision and inspection of carrying out of the implementation plan, which is essentially the evaluation of the efficiency of the implementation plan.

Entrepreneurship courses: Innovation and entrepreneurship courses in colleges and universities are an important carrier to achieve the goal of educating people and a carrier to measure the process of entrepreneurship education and the effect of running a school as well. Colleges and universities innovation and entrepreneurship courses include compulsory and elective courses which can cover all students thus to ensure that students can generally accept innovation and entrepreneurship education and improving education. On the other side, entrepreneurship courses are represented by two indices: the number of entrepreneurial education courses and the proportion of students who choose innovation and entrepreneurship course as their electives the whole school.

Entrepreneurship project: Entrepreneurship project is a link to transform entrepreneurship teaching results into innovative entrepreneurship practice. Entrepreneurship projects carried out by colleges and universities mainly include national-level innovation and entrepreneurship training programs, Internet + competition projects, and various types of innovation and entrepreneurship competitions at all levels organized by the government. The number of entrepreneurial plan projects and the proportion of students participating in various innovation and entrepreneurship plan projects (competitions) in the school are two indices that show the enthusiasm, initiative and initiative of college students in participating.

Practice platform: The innovation and entrepreneurship practice platform in colleges and universities is a platform for promoting the transformation of college innovation and entrepreneurship education results, realizing the leap from creativity to innovation, innovation to entrepreneurship, and reaching the transformation of college education into social achievements. The innovation and entrepreneurship practice platform of colleges and universities includes innovation and entrepreneurship training rooms, science and technology parks, pioneer parks, and number of incubators.

4.2.4. Outcome Evaluation - performance ability indices of entrepreneurship outcome

Outcome evaluation is stated for the evaluation of the degree of achievement of the goal, which is essentially a formative evaluation of the program.

Literacy improvement: Literacy improvement is the embodiment of the achievements of colleges and universities' innovation and entrepreneurship education at the student level. The number of awards in the national college student entrepreneurship plan competition can reflect to the actual effect of universities in cultivating

innovative talents and promoting the integration of industry, education and research in some degree. Besides, the improvement of college students' psychological characteristics of entrepreneurship can present the degree of improvement of college students' psychological characteristics of entrepreneurship through quantitative entrepreneurial psychological evaluation tools.

Entrepreneurship effect: Entrepreneurship effect is the embodiment of innovation and entrepreneurship education results in colleges and universities at the school level, which includes the proportion of students who started their own businesses in school, and the cumulative number of incubating enterprises in science and technology parks, incubators, and pioneer parks of colleges and universities.

Social benefits: Social benefits are a social level performance of innovation and entrepreneurship education achievements of colleges and universities. The ratio of entrepreneurship rate to employment rate indicates the actual effect of innovation and entrepreneurship education to drive employment through entrepreneurship. Moreover,

the number of outstanding entrepreneurial alumni can present that the innovation and entrepreneurship education of colleges and universities has cultivated entrepreneurial elites and displayed the demonstration and leading effect of entrepreneurial role models.

4.3. Setting of evaluation indices weight

The weight of the indices refers to the value of the importance and proportion of the evaluation indices in the overall evaluation system. In this project research, the analytic hierarchy process is used to assign weights to indices. This project selected more than 10 experts who had been engaged in innovation and entrepreneurship education research as both full-time and part-time teachers for more than 3 years and innovation and entrepreneurship education managers for investigation, and finally established the three-level indices weight.

Table 2. Weights of evaluation indices for quality of innovation and entrepreneurship education

First-level indices	Weight	Second-level indices	Weight
Entrepreneurship Environment	0.1571	Regional environment	0.2312
		Top-level design	0.3802
		Technical foundation	0.3886
Entrepreneurship Resources	0.3745	Teacher input	0.4932
		Fund investment	0.2245
		Organization guarantee	0.2823
Entrepreneurship Process	0.2753	Entrepreneurship courses	0.4237
		Entrepreneurship projects	0.3064
		Practice platform	0.2699
Entrepreneurship Results	0.1931	Literacy improvement	0.3556
		Entrepreneurial effects	0.2976
		Social benefits	0.3468

5. SUMMARY

Based on the research results of domestic and foreign experts and the relevant theories of the CIPP model, this study established a CIPP model-based evaluation indices system for the level of innovation and entrepreneurship education in colleges and universities, which has 4 main indicators and 12 secondary indicators, mainly including the foundation of innovation and entrepreneurship environment, the allocation of innovation and entrepreneurship resources, the process of innovation and entrepreneurship, and the performance of innovation and entrepreneurship results. The purpose of CIPP evaluation mode is continuous improvement. In the evaluation of the quality of innovation and entrepreneurship education in colleges and universities, it is necessary to conduct a comprehensive evaluation from multiple dimensions of environment, resources, process, and results and discover problems, continuously improve to thereby enhance the quality of innovation and entrepreneurship education in colleges and universities.

ACKNOWLEDGMENT

This work was supported by the project of 2019 Shaanxi Provincial Higher Education Society (XGH19211).

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