American Journal of Management Science and Engineering
2022; 7(6): 86-92
http://www.sciencepublishinggroup.com/j/ajmse
doi: 10.11648/j.ajmse.20220706.12
ISSN: 2575-193X (Print); ISSN: 2575-1379 (Online)

Research on the Quality Evaluation Index System and Model Construction of Entrepreneurship Education in Local Colleges and Universities Based on AHP-TOPSIS Method

Sheng Jing[1], Chen Zheng[2, *], Jing Mei Xiang[3]

[1]School of Computer and Information Engineering, Yongzhou Vocational and Technical College, Yongzhou, China

[2]School of Computer Science and Engineering, Hunan Institute of Technology, Hengyang, China

[3]School of Marxism, Hunan Institute of Traffic Engineering, Hengyang, China

Email address:

362315129@qq.com (Sheng Jing), 751945192@qq.com (Chen Zheng), 2195058864@qq.com (Jing Mei Xiang)

[*]Corresponding author

To cite this article:

Sheng Jing, Chen Zheng, Jing Mei Xiang. Research on the Quality Evaluation Index System and Model Construction of Entrepreneurship Education in Local Colleges and Universities Based on AHP-TOPSIS Method. *American Journal of Management Science and Engineering*. Vol. 7, No. 6, 2022, pp. 86-92. doi: 10.11648/j.ajmse.20220706.12

Received: October 30, 2022; **Accepted**: November 29, 2022; **Published**: December 8, 2022

Abstract: Entrepreneurship education is an important way for local colleges and universities to improve the quality of talent training, enhance the employability of college students, and better serve economic and social development. With the rise of innovation and entrepreneurship to the national strategic level, entrepreneurship education in colleges and universities and its quality have received much attention. In order to improve the quality of entrepreneurship education in local colleges and universities and help the high-quality development of local colleges and universities, this paper applies the AHP-TOPSIS analysis method to build an evaluation index system for the quality of entrepreneurship education in local colleges and universities, including four criteria levels of entrepreneurship education environment, teaching design, teacher level, and student performance, and 20 secondary indicators. The quality evaluation index system of entrepreneurship education in local colleges and universities is used to empirically evaluate the quality of entrepreneurship education in eight local colleges and universities in Hunan Province. The order of the quality of entrepreneurship education in eight local colleges and universities is: $d_2 > d_1 > d_3 > d_8 > d_7 > d_4 > d_5 > d_6$. The results of this study will help to provide theoretical and practical support for improving the quality of entrepreneurship education of college students in Hunan and even in local colleges and universities across the country.

Keywords: Local Colleges and Universities, College Students' Entrepreneurship, Education Quality Evaluation, AHP-TOPSIS

1. Introduction

The "mass entrepreneurship and innovation" strategy has been widely promoted in our country. In the implementation process of this strategy, what kind of results has been achieved by the entrepreneurship talent training of local colleges and universities? More and more scholars have conducted extensive research and analysis on this and regarded the construction of the quality evaluation system of entrepreneurial education as a key research topic. The quality evaluation of entrepreneurship education in local colleges and universities should establish a scientific and comprehensive evaluation index system, according to which evaluators can collect data and evaluate, judge, and control various factors affecting entrepreneurship education. Through the evaluation, the defects and deficiencies in the field of entrepreneurial talent training can be clarified, and help and support can be provided for the efficient treatment of relevant problems, to comprehensively improve the quality of entrepreneurial talent training and promote the level of entrepreneurial education in local universities. Obviously, it is of great practical significance to establish a scientific quality evaluation system for entrepreneurship education in local universities, accurately and objectively evaluate the performance of entrepreneurship education in local universities, cultivate more excellent entrepreneurial talents and meet the

needs of all aspects of society [1].

At present, the methods used in the quality evaluation of entrepreneurship education in China mainly include multivariate analysis, analytic hierarchy process and comprehensive analysis. Li Jicheng (2012) used DEA model method to study the quality of entrepreneurship education in local universities, and believed that this model constructed perfect indicators from the input and output of entrepreneurship, which could objectively evaluate the quality of entrepreneurship education [2]. Meng Chao (2018) studied the quality evaluation of entrepreneurship education in local universities by applying AHP method [3]. Li Yue et al. (2014) adopted the tool of balanced scorecard to analyze from the target layer, customer layer, process layer and resource layer, and established the corresponding evaluation index system [4]. Ge Li (2014) analyzed the CIPP model and took it as an opportunity to create an evaluation system for entrepreneurship education in colleges and universities, introducing various contents and integrating various models [5]. Wu Guanrong (2017) adopted DPSIR model and achieved success when constructing the quality evaluation system of entrepreneurship education in colleges and universities [6].

Through the review of the above literature, it can be seen that the academic community has recognized the importance of the evaluation model when constructing the quality evaluation system of entrepreneurship education in local colleges and universities. However, in the previous evaluation field, the evaluation was mainly carried out by a single method, so the obtained results have low reference value. However, the quality assessment of entrepreneurship education in local colleges and universities is complicated and involves many factors, so a single method cannot meet the evaluation requirements. Therefore, to effectively deal with this problem, it is necessary to combine qualitative and quantitative analysis methods, so as to improve the accuracy and reference value of the evaluation results. This paper uses the AHP-TOPSIS method to construct and apply the quality evaluation index system of entrepreneurship education in local colleges and universities. The AHP analysis method considers the multi-objective decision-making of complex things from the perspective of systematics. In the process of decision-making thinking, it constructs a hierarchical evaluation index system, optimizes the quantitative evaluation criteria, quantifies the contribution of each evaluation index to the decision-making goal, and determines the importance weight value of each evaluation index to the evaluation object through mathematical operation; TOPSIS method refers to the ranking method of approaching ideal solution. In this method, it is first necessary to rank the ideal target and the evaluation object according to their proximity, to analyze the advantages and disadvantages of the evaluation object. It is a method that can be used to evaluate and analyze multi-objective decision-making [7]. Hunan Province is a big economic and educational province, but the employment rate of Hunan Province is 1.3 percentage points lower than the national average. Obviously, the entrepreneurial ability of college students in Hunan Province is not high, which needs to be improved and perfected to a certain extent. This paper combines the current situation of college students' entrepreneurship in Hunan Province, comprehensively analyzes the purpose and requirements of evaluation, and establishes the corresponding entrepreneurial education quality evaluation system, aiming to provide theoretical and practical support for improving the quality of college students' entrepreneurship education in Hunan Province, and play a reference role for related research.

2. The Connotation of the Quality of Entrepreneurship Education in Local Universities

2.1. AHP-TOPSIS Research Method

2.1.1. AHP Method

When evaluating the quality of entrepreneurship education in local colleges and universities, due to the different importance of each index, the proportion of indicators is naturally different. The AHP method can determine the reasonable weight of each index [8]. In the calculation process, in order to find the accurate information entropy, we pay attention to the deviation between the indicators. Because of the support of entropy weight, we can further clarify the proportion of each indicator. Using this method, all the hidden data can be presented in an intuitive form, and the relevant indicators can be understood more deeply and clearly, and the indicator information can be grasped more comprehensively.

2.1.2. TOPSIS Model

In the process of building this model, we should fully realize that the biggest advantage of this model is reflected in the use of a reasonable ranking method, which can get a more ideal conclusion. Many scholars will choose this model when conducting multi-attribute analysis and this decision technology has been widely used in the field of systems engineering [9]. How to determine the superiority and inferiority of the evaluated objects and how to rank them should not only consider the characteristics of the evaluated objects, but also grasp the distance between various indicators, analyze the optimal and worst solutions, and clarify the degree of goal deviation, so as to make an objective evaluation of the quality of entrepreneurial education. It comprehensively and truly reflects the real development situation of improving the quality of entrepreneurship education in local colleges and universities.

2.2. Re-determine the Connotation of Entrepreneurial Education Quality Based on AHP-TOPSIS Method

When evaluating the quality of entrepreneurship education in local colleges and universities, this paper chooses the TOPSIS model analysis based on the analysis of the connotation and quality requirements of entrepreneurship education, and comprehensively considers the influencing factors of entrepreneurship education in various aspects of the evaluation process. For example, the environment for local colleges and universities to carry out entrepreneurship education, the construction level of double-qualified and dual-ability teachers, and the effect of college students'

innovative and entrepreneurial activities, all of which can reflect the concept of local colleges and universities to carry out entrepreneurship education, but also reflect the quality of entrepreneurship education in local colleges and universities. At present, scholars have obtained some mature conclusions in the research of entrepreneurship education in colleges and universities, but they have not built a perfect evaluation index system, and there are shortcomings in the research of quantitative evaluation. Therefore, the AHP-TOPSIS analysis method is adopted in this study. The AHP method can only ensure the final result by scoring the weights based on the original data through experts in related fields, which has a certain objectivity. On the basis of the AHP method to determine the index weight, the TOPSIS method is used to complete the quality evaluation ranking of entrepreneurship education in local universities, so as to enhance the effectiveness of the weight distribution of each index in the evaluation system, and it is hoped to provide a reference for other scholars' similar research in the future [10].

3. Research Design

3.1. Construction of Evaluation Index System

The success of the evaluation system depends on whether appropriate indicators can be selected [11]. Two points should be paid attention to in this link: first, whether the selected indicators can truthfully reflect the achievements made in the implementation of entrepreneurship education in colleges and universities, whether they can find out the key problems, and whether they can comprehensively describe their status; The second is whether the implementability of the selected indicators in the evaluation is guaranteed and whether a clear concept has been established. If the quantitative index is selected, the easy determination of the index should be paid attention to, while the qualitative index should be analyzed to ensure the validity of the fuzzy measure [12]. In the development of entrepreneurship education, colleges and universities should keep in touch with the government, enterprises, and other forces, and multiple participants should support each other. Any one subject will affect the quality of education. At the same time, the quality of entrepreneurship education in colleges and universities will also be affected by the level of teachers, student performance, educational environment, and, other factors. Therefore, this paper sets four criterion levels, namely, entrepreneurial education environment, teaching design, teacher level and student performance, and then divides them into 20 second-level indicators. All second-level indicators are consistent with the criterion level, as shown in Table 1.

Table 1. *Weight of evaluation index.*

Primary indicators	Weight	Secondary indicators	Weight	Total weight
Entrepreneurial Education Environment	0.340	Increase rate of venture capital investment (%) X1	0.067	0.023
		Preferential policy quantity X2	0.264	0.090
		Number of management institutions implementing entrepreneurship education X3	0.141	0.048
		Number of associations X4	0.080	0.027
		Number of students receiving "mass entrepreneurship and innovation" funds X5	0.098	0.033
		Number of enterprises in school-enterprise cooperation X6	0.350	0.119
Instructional Design	0.202	Core course offering rate (%) X7	0.536	0.108
		Class hour setting rate (%) X8	0.313	0.063
		Penetration rate of entrepreneurial knowledge (%) X9	0.151	0.031
		The proportion of double-qualified teachers (%) X10	0.115	0.033
Teacher Level	0.286	Student satisfaction rate in terms of teacher allocation (%) X11	0.339	0.097
		Proportion of teachers with doctor's degrees (%) X12	0.339	0.097
		Number of entrepreneurs' speeches at school X13	0.115	0.033
		Number of high-quality papers published by teachers X14	0.092	0.026
Student Performance	0.172	Transformation rate of entrepreneurial achievements (%) X15	0.360	0.062
		Ratio of graduates choosing to start their own businesses (%) X16	0.193	0.033
		Percentage of students in entrepreneurship courses (%) X17	0.140	0.024
		Ratio of students mastering entrepreneurial knowledge (%) X18	0.193	0.033
		Increase rate of the number of students participating in competitions and practical activities (%) X19	0.039	0.007
		Success rate of students' entrepreneurship (%) X20	0.075	0.013

3.2. Quantify the Steps of Model Construction

In the decision-making analysis link, this paper chooses AHP-TOPSIS analysis method, which is a method involving a number of objectives and indicators, has strong flexibility in practice, can get real and effective analysis results. When evaluating the feasibility of the decision scheme, we should focus on the ideal solution and the negative ideal solution, especially analyze the distance formed between them, and make an evaluation accordingly. At present, this method has been fully used in the evaluation of bidding, economic construction, project planning, water and land resources utilization, and the popularization rate is relatively high. The modeling process is analyzed as follows:

(1) The number of evaluation indicators is set as n, and the number of objects to be evaluated is set as P, Obtain raw data matrix.

$$X=\begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1p} \\ x_{21} & x_{22} & \cdots & x_{2p} \\ \cdots & \cdots & \cdots & \cdots \\ x_{n1} & x_{n2} & \cdots & x_{np} \end{bmatrix}_{n\times p}$$

(2) Normalize the original data.

$$G=\begin{bmatrix} g_{11} & g_{12} & \cdots & g_{1p} \\ g_{21} & g_{22} & \cdots & g_{2p} \\ \cdots & \cdots & \cdots & \cdots \\ g_{n1} & g_{n2} & \cdots & g_{np} \end{bmatrix}_{n\times p}$$

Where $g_{ij}=\dfrac{x_{ij}}{\sum_{k=1}^{p} x_{ik}}, i=1,2,...,n; j=1,2,...,p$

(3) Forming a weighted decision matrix Z. In the specific analysis, the weighting is an indispensable link, which is mainly achieved by determining the importance of the index. To improve the effectiveness of the weighting, the phenomenon of multiplying the dimensionless matrix with the weight value of each index often occurs, based on which the weighted decision matrix Z can be formed [13]. If it is found that the evaluation index belongs to the income type, we need to focus on the income level generated, the higher the income, the better the index; If it is found that the evaluation index belongs to the cost type, it is necessary to take the cost level as the indicator to determine the reference, the lower the cost, the better the index [14].

$$Z=\begin{bmatrix} z_{11} & z_{12} & \cdots & z_{1p} \\ z_{21} & z_{22} & \cdots & z_{2p} \\ \cdots & \cdots & \cdots & \cdots \\ z_{n1} & z_{n2} & \cdots & z_{np} \end{bmatrix}_{n\times p}$$

Where $z_{ij}=g_{ij}\times\omega_i, i=1,2,...,n; j=1,2,...,p;$ ω_i is the weight of the *i*th index.

(4) Rank the participating objects. When determining the weight, firstly, the difference of the index in the Z matrix is clarified through the analytic hierarchy process to enhance the scientific nature of the evaluation index. In this link, the positive ideal solution should be described in terms of the optimal solution, while the negative ideal solution should be described in terms of the worst solution, which is exactly the opposite. In this case, the positive ideal solution Z+ and the negative ideal solution Z- refer to the set of maximum and minimum values of an index respectively.

$$Z^{+}=(z_1^{+},z_2^{+},...,z_n^{+}); Z^{-}=(z_1^{-},z_2^{-},...,z_n^{-})$$

Where $z_i^{+}=(z_{i1}^{+},z_{i2}^{+},...,z_{ip}^{+}), i=1,2,...,n;$ $z_i^{-}=(z_{i1}^{-},z_{i2}^{-},...,z_{ip}^{-}), i=1,2,...,n.$

(5) Sort the participating objects in a certain order. The evaluation objects are sorted based on entropy weight. Therefore, the positive ideal solution and the negative ideal solution can be expressed by D+i and D-i respectively, and can be obtained by the following two formulas.

$$D_j^{+}=\sqrt{\sum_{i=1}^{n}(z_{ij}-z_i^{+})^2}, D_j^{-}=\sqrt{\sum_{i=1}^{n}(z_{ij}-z_i^{-})^2}$$

(6) Calculate the closeness degree between the optimal value and each evaluation unit. According to the distance between all the participants and the positive ideal solution and the negative ideal solution, they are respectively described as D+i, d-i. In this way, the scheme can be calculated and the closeness degree Ci can be obtained:

$$C_j=\frac{D_j^{-}}{D_j^{+}+D_j^{-}}, j=1,2,....,p$$

If the closeness degree Ci is relatively high, it means that the closeness degree between the evaluation object and the ideal solution is relatively high, and even can reach the state of very close. It can be seen that the closeness degree Ci is an important reference when sorting the advantages and disadvantages of the participants [15].

4. Empirical Analysis on the Quality Evaluation of Entrepreneurship Education in Local Universities

4.1. Select the Evaluation Object and Calculate the Initial Value

To justify the above model, this article from Hunan province in the study chose 8 local colleges and universities, as an empirical analysis case, according to the specific situation of the school, to describe, in letters A - H A and B are the key university, C and D are the general universities, E for normal college, and F and G as the college of engineering, H is a private college. Based on understanding the current development situation of these eight schools, five experts in the field of entrepreneurship education are arranged to score the indicators in Table 1, and the values of all indicators are kept to two decimal places. Because of the arithmetic average method, the initial value of each index of these schools was summarized and calculated, and the value of the entrepreneurial education quality evaluation index of 8 local universities in Hunan Province was obtained (Table 2).

Table 2. *Summary of entrepreneurial education quality evaluation index values of 8 schools.*

Indicators	A	B	C	D	E	F	G	H
X_1	0.375	0.425	0.275	0.188	0.163	0.163	0.188	0.225
X_2	0.500	0.500	0.300	0.175	0.125	0.150	0.250	0.350
X_3	0.475	0.475	0.425	0.350	0.250	0.250	0.350	0.425
X_4	0.650	0.725	0.575	0.475	0.425	0.375	0.325	0.400
X_5	0.850	0.850	0.750	0.675	0.625	0.625	0.675	0.750
X_6	0.825	0.763	0.588	0.475	0.425	0.500	0.700	0.800
X_7	0.750	0.775	0.725	0.700	0.700	0.675	0.625	0.650
X_8	0.575	0.625	0.475	0.375	0.325	0.300	0.300	0.375
X_9	0.875	0.888	0.863	0.850	0.850	0.838	0.813	0.825
X_{10}	0.925	0.975	0.925	0.850	0.750	0.700	0.700	0.775
X_{11}	0.525	0.550	0.450	0.375	0.325	0.313	0.338	0.400
X_{12}	0.663	0.725	0.575	0.475	0.425	0.400	0.400	0.463
X_{13}	0.800	0.813	0.738	0.663	0.588	0.575	0.625	0.700
X_{14}	0.538	0.613	0.438	0.313	0.238	0.188	0.163	0.263
X_{15}	0.425	0.488	0.563	0.550	0.450	0.388	0.363	0.375
X_{16}	0.850	0.863	0.788	0.750	0.750	0.738	0.713	0.750
X_{17}	0.888	0.888	0.863	0.838	0.813	0.800	0.800	0.838
X_{18}	0.550	0.625	0.575	0.525	0.475	0.438	0.413	0.425
X_{19}	0.238	0.275	0.225	0.175	0.125	0.113	0.138	0.163
X_{20}	0.338	0.362	0.388	0.388	0.363	0.338	0.313	0.313

4.2. AHP Method to Determine the Index Weight

The weight is determined by Hunan Institute of Technology, Hengyang Normal College, University of South China and other 7 professional garden planning designers in accordance with the degree of importance for 20 different indicators one by one after comparison, it is verified that the consistency of the relevant requirements are also consistent, so as to obtain the index weight listed in Table 1.

4.3. TOPSIS Weighted Ranking

In this link, the weights calculated by AHP method are used to construct the standardized matrix, and the weights of each index in Table 3 are taken as the reference for calculation, thus determining the decision matrix Z (Table 3).

Table 3. *Decision matrix Z.*

Indicators	A	B	C	D	E	F	G	H
X_1	0.0007	0.0007	0.0006	0.0004	0.0004	0.0004	0.0005	0.0005
X_2	0.0036	0.0034	0.0025	0.0016	0.0012	0.0015	0.0025	0.0031
X_3	0.0018	0.0017	0.0018	0.0017	0.0013	0.0014	0.0018	0.0020
X_4	0.0014	0.0015	0.0014	0.0013	0.0014	0.0011	0.0010	0.0011
X_5	0.0022	0.0021	0.0022	0.0022	0.0022	0.0023	0.0024	0.0024
X_6	0.0078	0.0069	0.0061	0.0056	0.0055	0.0067	0.0091	0.0093
X_7	0.0064	0.0063	0.0068	0.0074	0.0082	0.0082	0.0073	0.0068
X_8	0.0029	0.0030	0.0026	0.0023	0.0022	0.0021	0.0021	0.0023
X_9	0.0022	0.0021	0.0023	0.0026	0.0027	0.0029	0.0027	0.0025
X_{10}	0.0024	0.0024	0.0027	0.0028	0.0027	0.0026	0.0025	0.0025
X_{11}	0.0040	0.0040	0.0038	0.0036	0.0034	0.0034	0.0036	0.0038
X_{12}	0.0051	0.0053	0.0049	0.0045	0.0045	0.0044	0.0042	0.0044
X_{13}	0.0021	0.0020	0.0021	0.0022	0.0021	0.0021	0.0022	0.0023
X_{14}	0.0011	0.0012	0.0010	0.0001	0.0007	0.0006	0.0005	0.0007
X_{15}	0.0021	0.0023	0.0030	0.0034	0.0030	0.0027	0.0025	0.0023
X_{16}	0.0022	0.0022	0.0023	0.0024	0.0027	0.0028	0.0026	0.0024
X_{17}	0.0017	0.0016	0.0018	0.0020	0.0021	0.0022	0.0021	0.0020
X_{18}	0.0014	0.0016	0.0017	0.0017	0.0017	0.0016	0.0015	0.0014
X_{19}	0.0001	0.0002	0.0001	0.0001	0.0000	0.0000	0.0001	0.0001
X_{20}	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0004	0.0004

Using the above formula, the corresponding values of positive ideal solution and negative ideal solution can be obtained. In order to ensure the validity of this value, after in-depth analysis, the distance between the 8 local universities and positive ideal solution and negative ideal solution can be accurately judged. The specific situation is listed in Table 4 [4]:

Table 4. *Statistical table of the difference between the correct and positive/negative ideal solutions.*

Indicators	A	B	C	D	E	F	G	H
D^+_i	0.0033	0.0020	0.0113	0.0183	0.0217	0.0212	0.0174	0.0125
D^-_i	0.0212	0.0221	0.0120	0.0058	0.0025	0.0023	0.0083	0.0132
C_i	0.8643	0.9187	0.5144	0.2412	0.1047	0.0987	0.3219	0.5129

8 universities entrepreneurship education quality by calculating the comprehensive evaluation value between positive ideal solution and the closeness, 8 universities entrepreneurship education quality exists obvious difference, B is the highest, followed by A school, the third member of the school is C, and 4, 5, 6 H, G, D three schools, for E school again, to the lowest in the F. Among the 8 universities, the highest comprehensive evaluation value is 0.9187, and the lowest is only 0.0987, which shows a big difference. The specific order is as follows:

$$d_2 > d_1 > d_3 > d_8 > d_7 > d_4 > d_5 > d_6$$

According to the comprehensive evaluation value of entrepreneurship education quality of these eight schools, A (key university) ranks first, while E (engineering university) ranks last.

5. Conclusion

This paper aims to improve the ability of local universities in entrepreneurship education by constructing a quality evaluation system for local universities' entrepreneurship education. However, whether the proposed suggestions can really play a role remains to be tested in the future. In the next stage, many things need to be further improved in the exploration of the construction of the quality evaluation system of entrepreneurship education in local universities [5]. From the theoretical point of view, the construction of the quality evaluation system of entrepreneurship education in local universities should be humanized and scientific as much as possible. In terms of practice, to be combined the present situation with the local university to put forward a more reasonable proposal, evaluation work needs to get more people to participate in, work together in problem-solving, especially to the index to study the reliability and validity, to strive for the computer software into the evaluation index system building, making local colleges and universities can truly become a "think tank" for the construction of the local economy.

Acknowledgements

This research was funded by Hunan Provincial Social Science Achievement Appraisal Committee Generally Projects “Research on the Construction of Evaluation Index System for Innovation and Entrepreneurship Education in Higher Vocational Colleges in Hunan Province Based on AHP Model” (No.: XSP22YBZ150).

Hengyang Social Science Foundation's project of city situation topic "Research on the Multiple Dynamic Mechanism and Dynamic Model of Hengyang University Students' Returning Home and Entrepreneurship Based on TOPSIS Law" (No. 2022B [II] 006).

References

[1] Wu Yang. Research on the performance Evaluation System of University Teachers based on AHP-FCE [J]. Journal of Guangxi Normal University of Science and Technology, 2016, 31 (06): 121-124+132.

[2] Li Jicheng. Research on Entrepreneurial education quality evaluation System based on efficiency perspective [J]. Science and Technology Management Research, 2012. 32 (15): 145-149.

[3] Meng Chao. Introduction of AHP into the Evaluation index System of College Students' Employment and Entrepreneurship Education [J]. Journal of Liaoning University of Technology (Social Science Edition), 2018, 20 (02): 92-94.

[4] Li Yue, Wang Hongqi. Design of evaluation index system of entrepreneurship education quality in colleges and universities based on BSC [J]. Science and Management, 2014, 16 (02): 53-57.

[5] Ge L. Evaluation and Improvement of Entrepreneurial education ability in universities based on CIPP [D]. Dalian: Master Dissertation of Dalian University of Technology, 2014.

[6] Wu Guanrong. Research on the selection of evaluation index of Entrepreneurship Education Quality in Universities based on DPSIR model [J]. Journal of Social Sciences of Shanxi Universities, 2017. 29 (12): 81-83.

[7] Luo Yidun, Zhou Yicen, Chen Zheng. RLandscape Quality Evaluation of Ecological Tea Garden Based on AHP-TOPSIS-POE Combined Model [J]. Economic Geography, 2020, 40 (12): 183-190.

[8] Lucas R I, Promentilla M A, Ubando A, et al. An AHP-based evaluation method for teacher training workshop on information and communication technology [J]. Evaluation and program planning, 2017, 63: 93-100.

[9] Adetunji O, Bischoff J, Willy C J. Managing system obsolescence via multicriteria decision making [J]. Systems Engineering, 2018, 21 (4): 307-321.

[10] Xu X, Wang Y, Yu S. Teaching performance evaluation in smart campus [J]. IEEE Access, 2018, 6: 77754-77766.

[11] Mukhopadhyay M. Total quality management in education [M]. SAGE Publications Pvt. Limited, 2020.

[12] Coulter P B. Measuring inequality: A methodological handbook [M]. Routledge, 2019.

[13] Pan Ni, Wu Yong, Xu Zhengdong, Li Zhen. Application of TOPSIS model based on improved entropy weight in comprehensive assessment of water Aquality in Taizi River Basin [J]. Hongshui river, 2017 (1): 7-13.

[14] Liu Xinze. Study on Quality Evaluation System of Innovation and Entrepreneurship Education in Local universities in Liaoning Province [D]. Shenyang: Master Thesis, Shenyang Normal University, 2018.

[15] Wang Xueying, Liu Xinze. Quality evaluation of innovation and entrepreneurship education in colleges and universities based on entropy weight TOPSIS model [J]. Journal of Shenyang Normal University (Natural Science Edition), 2018 (1): 47-51.