Research Article

Random Matrix Model for the Ecological Model of Innovation and Entrepreneurship Education for College Students

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1. Introduction

From the perspective of the international situation, the international economic structure is undergoing in-depth adjustment, the global financial structure is still turbulent, the development of emerging market economies is hindered, and the competition in the international market is becoming more and more fierce [1]. On the other hand, the current domestic situation is severe, various opportunities and risks coexist, and multiple contradictions emerge one after another. Under this situation, it is proposed that under the influence of the new economic normal, China will face new opportunities and challenges. As an indispensable factor in my country’s emerging economic entities, college students’ employment and entrepreneurship groups are also facing severe challenges [2]. Under the background of the new economic normal, the economic situation has changed, and the college students are difficult to find employment and start a business, which has led to some problems in the concept of career choice and entrepreneurship for college students [3]. Therefore, how to strengthen and implement the innovation and entrepreneurship education of college students is imminent. We must accurately study and judge the value orientation of the current economic development.
under the new normal, lead the direction of innovation and entrepreneurship education, strive to give full play to its due value, and overcome difficulties from all aspects, so that it can better serve the development of the new normal of the economy.

To achieve the victory of the “economic war,” we must turn the disadvantage of population into human capital and cultivate college students. Therefore, college students who receive innovation and entrepreneurship education can inject fresh blood into the new normal economic market, stimulate market vitality, bring strong impetus to economic transformation, and promote stable and healthy economic development [4]. Since the expansion of college enrollment, the employment situation of college students has deteriorated. It is estimated that by 2030, the proportion of China’s labor force to the total population will remain above 60%. College students have also evolved from “finding jobs” at the beginning to “seeking jobs.” The imbalance between the supply of college students and the demand for jobs in the market has resulted in the “retention” of talents, causing many social conflicts, and the employment problem has become a government issue [5, 6]. Therefore, college students’ innovation and entrepreneurship education conforms to the trend of the times and is the internal demand of society, economy, and college students’ own development.

Using ecological horizons to observe reality, explain the real world, and analyze problems from the perspective of the entire ecosystem is a new theoretical framework for understanding the world. Ecological thinking reveals the overall unity and richness of the ecosystem. It advocates all-round ecological care and emphasizes the harmony between man and society and between man and nature. It is a brand-new holistic way of thinking. This paper introduces some basic knowledge of random matrix theory and gives a brief description of Monte Carlo method. In this paper, the weight coefficients of indicators at all levels are constructed by the analytic hierarchy process, three common calculation methods of the weight coefficients are introduced in reality, and the analytic hierarchy process is finally selected as the calculation method. At the same time, combined with the results of the second round of expert consultation, the expert scores are converted into coefficients of the judgment matrix, which reduces the influence of individual subjective judgments and finally calculates the weight coefficient of the entire index system. The reliability and validity of the constructed index system are tested. The content of the reliability test is the degree of internal consistency, and the validity test is the construct validity, convergent validity, and discriminant validity, which shows that the index system constructed in this study has good reliability and validity.

2. Related Work

RFS theory mainly refers to the statistical theory of random finite sets, which is a new theory for solving information fusion and multi-target tracking in complex environments. Related scholars extended the RFS theory from point target tracking to extended target tracking and proposed the ET-PHD filtering algorithm [7]. The algorithm first regards the state set and measurement set of the target as a random finite set. PHD is filtered and updated through the measurement at each moment, and the estimated state of the extended target can be accurately obtained [8]. Management knowledge should be taught while imparting skills. Entrepreneurship education should help students gain hands-on practical experience through various forms of activities. Through experience, students can hone their will, cultivate entrepreneurial ability, and acquire entrepreneurial skills.

According to the differences in the objects of innovation and entrepreneurship education, innovation and entrepreneurship education models can be divided into two types: focused and divergent. The focused type emphasizes the development of specialized innovation training and innovation and entrepreneurship education for students with strong willingness to innovate and entrepreneurship, while the divergent type emphasizes that innovation and entrepreneurship education is a kind of universal education.

British ecologist Tansley introduced the concept of “system” from physics to ecology and proposed the ecosystem for the first time [9]. Ecosystem refers to a unified whole formed by the continuous process of material circulation and energy exchange between all organisms and the environment in a certain space in nature. Each component is interrelated and dependent, and the ecosystem is also open. Foreign innovation and entrepreneurship education developed earlier, and foreign experts and scholars have conducted extensive research on it. Relevant scholars believe that the entrepreneurship education ecosystem is based on universities, including multiple elements such as individuals (students, teachers, employees, practitioners, and managers) and organizations (incubators, R&D centers), its core is internal entrepreneurial activities, and the periphery is composed of entrepreneurial culture, resources, shareholders, infrastructure, etc. [10]. Not only that, but also some forward-looking work has been done for students’ life after graduation, such as specific requirements for students’ professional ability, cooperative ability and civic ethics [11].

France pays more attention to practical operation and pursues the concept of “practice yields true knowledge.” Entrepreneurial activities such as “running a business in middle school” and “teaching middle school students to run a business” allow students to get in touch with the working environment as soon as possible, cultivate their innovative spirit in practice, and improve their entrepreneurial ability [12].

Finland has fully implemented independent interdisciplinary learning in the basic education stage, and all schools have no less than one week of entrepreneurship-themed teaching in each semester, and the content can carry out open-ended activities [13]. Entrepreneurship education in Finland is exposed to entrepreneurship education in a teaching environment that is both learning and playing, and subtly planted the spiritual roots of entrepreneurship [14].

Domestic research on innovation and entrepreneurship education ecosystem mainly includes theoretical research and case study. In terms of speculative research, relevant scholars divide the innovation and entrepreneurship education ecosystem into three levels [15]. Relevant scholars believe that the innovation and entrepreneurship education
ecosystem has the characteristics of openness, complexity, and dynamic balance [16]. Researchers believe that an entrepreneurship education ecosystem with spontaneous coupling, collaborative interconnection, and endogenous growth between different elements must be formed in the future [17]. Therefore, it is necessary to clarify the core elements and build an entrepreneurship education ecosystem with regional characteristics.

Relevant scholars took the entrepreneurship education ecology of Lund University in Sweden as an example and introduced its entrepreneurship education ecosystem [18]. They believed that the innovation and entrepreneurship education ecosystem includes four elements, namely, producers, catalysts, decomposers, and consumers. Among them, producers have practice platforms, teaching models, and courses, and catalysts include practical plans, entrepreneurial organizations, and rules and regulations [19]. The decomposers provide entrepreneurial consulting services for the technology transfer office. Consumers include support from the government, industry, and investment circles. Relevant scholars pointed out that higher vocational colleges can rely on the mechanism of in-depth cooperation between schools and enterprises under the guidance of the integration of production and education, the practical carrier of the “real workplace” in the school, and the method of connecting with the needs of the industry to comprehensively enhance the innovative and entrepreneurial spirit and ability of college students [20–22]. Entrepreneurial talent training provides an incubation platform. The researchers analyzed the new era of entrepreneurship education goals, courses, teachers, and governance in secondary vocational schools from the perspective of the integration of production and education, and proposed the goals of entrepreneurship education that integrates innovation, entrepreneurship education, and proposed the goals of entrepreneurship education from the perspective of the integration of production and education, so as to understand the structure, transform the structure, and optimize the structure. Once you have mastered this structure, you feel that you have mastered the engine of this system. "Structure" generally refers to the stable connection between the constituent elements of an objective thing and its mode of action, including organizational form, order, and combination. It is an inherent stipulation that distinguishes one thing from other things. System structure is the totality of the elements that make up the system, the way and order of interaction, or the connection of the system. Western structuralism uses the word "structure" to mean "the organic correlation between the elements that make up the system" and the relatively stable form of action formed by this correlation.

Only by following the overall, comprehensive, dynamic, and balanced ecological thinking to design and adjust the structure of the system, can the overall proportion between the elements of the entrepreneurship education ecosystem and the proportional relationship within each element be more scientific, reasonable, and coordinated.

This makes the structure of the entrepreneurship education ecosystem adapt to the existing ecological environment and predictable future social development and promotes the optimization of the structure and maximization of the functions of the entrepreneurship education ecosystem.

The structure of the ecosystem is mainly composed of many elements of the ecosystem and their quantitative relationships, the distribution of each element in time and space, and the relationship between each element through energy, material, and information flow. The structure of the educational ecosystem is the form of connection between the various elements in the educational system, and the form of the relationship between each factor and the external environmental factors. The structure of the entrepreneurship education ecosystem in colleges and universities is the composition and distribution of various elements in the operation of the entrepreneurship education ecosystem in colleges and universities, as well as their interrelationships and modes of action.

To discuss its structure from the perspective of ecology, there are not only macro-structure system, meso-structure system, and micro-structure system, but also individual ecological structure and group ecological structure. Succession enhances the educational function of the system, as shown in Figure 1.

3.2. Construction of the Target Ecology of the Entrepreneurship Education Ecosystem in Colleges and Universities. Educational goals show the structure, composition, stages, and specific values of educational content, and are the direct basis for educational practice and evaluation activities. In short, the goal of education is to enable the educated to achieve a high level of productive social life, to improve the quality of material life and the quality of family and social life of the educated, to meet the needs of the educated to continue high-quality and efficient production and life. The effect of educators' quality of life is maximized. The goal of entrepreneurship education in colleges and universities is the expectation that colleges and universities implement entrepreneurship education activities in a certain period of social development. It is a complete system with rich connotations and multiple levels.

The relationship between the goal of entrepreneurship education and the main body of entrepreneurship education activities is the degree of expectation and degree of completion. The goals of entrepreneurship education fundamentally reflect the expectations of society and individuals.
for entrepreneurship education activities. However, due to the constraints of educators’ own knowledge, abilities, and subjective and objective factors, they have a precise understanding and comprehensive grasp of the specific connotations of entrepreneurship education goals. It is relatively limited, so in the actual process, educators can only approach the expected expectations infinitely and try to improve the achievement of the goal as much as possible. At present, although there is basically a consensus on the goals of entrepreneurship education, the connotation and extension of goals are also changing with the changes in social development needs. Educators’ understanding of educational goals is a dynamic process. Among other elements, it will be difficult to achieve effectively in practice.

3.3. The Diversified Construction of the Organizational Environment of Entrepreneurship Education. The organizational mechanism is a functional system for the setting and adjustment of various stakeholders or functional departments related to entrepreneurship education inside and outside the university. It is an important means to mobilize and develop the human and material resources of entrepreneurship education inside and outside the school by dividing and determining the responsibilities and tasks of various stakeholders and relevant functional departments, and coordinating their behaviors. From the outside of colleges and universities, the development of entrepreneurship education involves multiple stakeholders such as the government, enterprises, and parents. The government’s

\[ \text{Figure 1: The overall structure of the entrepreneurship education ecosystem in colleges and universities.} \]
investment and policy support for college students’ entrepreneurship, the participation of enterprises in college entrepreneurship education, and the family’s encouragement and support for children’s entrepreneurship all affect the choice of the organizational mechanism of entrepreneurship education and the creation of the organizational environment in colleges and universities. The organizational mechanism of entrepreneurship education under the leadership of the family focuses more on the continuation of revolution, and the entrepreneurship education under the promotion, the entrepreneurship education under the leadership of the government focuses more on administrative mechanisms to meet the actual requirements of the national economic construction, and the entrepreneurship education under the leadership of the family focuses more on the continuation of wealth.

The entrepreneurship education led by the educational affairs department focuses on the setting of entrepreneurship courses, the entrepreneurship education led by the employment guidance department focuses on driving employment through entrepreneurship, the entrepreneurship education led by the School of Entrepreneurship focuses on the discipline construction of entrepreneurship, and the entrepreneurship education led by various colleges focuses on entrepreneurship education.

In the construction of entrepreneurship platform, entrepreneurship education led by the entrepreneurship training center focuses on the construction of “big innovation projects,” and entrepreneurship education led by the Youth League Committee focuses on the development of entrepreneurial activities and competitions.

With the in-depth development of entrepreneurship education, various types of entrepreneurship education organizational mechanisms have some deficiencies or defects in the actual operation, which also makes colleges and universities begin to build entrepreneurship education organizational mechanisms more rationally. Colleges and universities should “work together,” starting from the overall reform of entrepreneurship education, starting from the whole process of talent training, and carrying out a series of reforms around entrepreneurship education, breaking through departmental barriers, forming educational affairs, scientific research, personnel, and academic work. Colleges and universities should “extensively connect,” actively promote the construction of college organizational mechanisms to meet the actual requirements of the national entrepreneurship education policy and evaluation standards, strengthen the cooperation and co-construction between colleges and universities and society, enterprises, regions, and industries, strive more for the development of entrepreneurship education, and establish an effective organization and cooperation mechanism for entrepreneurship education.

3.4. Construction of Classroom Ecology of College Entrepreneurship Education Ecosystem. The essence of the classroom is a micro-ecosystem with rich and complex life characteristics, which has the same characteristics of integrity, openness, diversity, and symbiosis as the natural ecosystem. However, as an artificial ecosystem, classroom ecosystem has dual attributes of natural ecosystem and cultural ecosystem.

To study the classroom ecology of entrepreneurship education is to examine and analyze the current entrepreneurship education classroom under the guidance of ecological philosophy, starting from the systematicness, vitality, growth, and innovation of the classroom, to study and follow the ecological laws in the specific field of classroom teaching. It aims to promote the material flow, information flow, and emotional flow between classroom ecological subjects and the environment, so that the classroom ecological system is in a state of virtuous circular development, and the ecological spirit and temperament are more prominent, to better realize the function of the classroom ecosystem in the cultivation of entrepreneurial talents. The construction of the classroom ecology of entrepreneurship education in colleges and universities follows the principles of “microsystem” unity and synergy, symbiosis and interaction, and dependency and self-organization, and builds harmony by maintaining a smooth “information flow.” Figure 2 shows a schematic diagram of the ecological construction of entrepreneurship education classrooms in colleges and universities.

3.5. Random Matrix Model. Let the random matrix corresponding to $C$ be: $R = (1/L)A \times A'$, where $A'$ represents the transpose of matrix $A$, $A$ is composed of $N$-independent sequences of length $L$, and these $N$ sequences obey $N(0, 1)$ distribution.

Under the fixed condition of $N \rightarrow \infty, L \rightarrow \infty$, $Q = (L/N)(\geq 1)$, the density function $P(\lambda)$ of the eigenvalue $\lambda$ of $R$ has the following analytical form:

$$P(\lambda) = \begin{cases} \frac{\lambda \sigma^2}{2\pi Q} (2\lambda - \lambda_+ - \lambda_-), & \lambda \in (\lambda_-, \lambda_+), \\ 0, & \text{Others.} \end{cases}$$

$$\lambda_+ = \frac{1}{Q} \left( 1 - \alpha^2 \right) \left( Q^{-1} - 1 - 2Q^{1/2} \right).$$

Here $\sigma^2 = 1$. It can be seen that the distribution range of random noise eigenvalues is $[\lambda_-, \lambda_+]$. In particular, when $Q > 1$, there are

$$\lambda_+ = \left( 1 - \pi Q \sigma^{-1} \right) > 0.$$ 

That is, the eigenvalues corresponding to $R$ are all non-negative; when $Q = 1$, there is $\lambda \in [0, 4]$. At the same time, the element $V_{a,b}$ of the $R$ eigenvector $V_a$ obeys the $N(0, 1)$ distribution, namely,

$$P(V) = \frac{2\pi \sigma e^{-V^2/(2\sigma^2)}}{Q}.$$ 

In order to quantify the contribution of the eigenvectors, the inverse parameter ratio commonly used in local theory can be used to measure, which is defined as follows:

$$I_k = \prod_{i=0}^{N-1} V_{ik} \cdot \left( \sigma + V_{ik} \right).$$
where $V_{i,k}$ represents the components of the feature vector.

The more uniform the distribution of eigenvector elements, the smaller the value of the antiparameter ratio; on the contrary, the more uneven the distribution of eigenvector elements, the smaller the corresponding antiparameter ratio. In addition, the inverse parameter ratio corresponding to the random matrix is

$$I_{RMT,k} = N \int_0^{\infty} 2\pi N V_{i,k} Q e^{-\left(V_{i,k}/2N\right)} dV_{i,k}.$$  \hspace{1cm} (6)

Monte Carlo method is a numerical calculation method based on “random numbers” and probability and statistics theory gradually approaching the actual distribution, thus infinitely approaching the optimal solution. It usually uses a computer as a platform and, through reasonable statistical modeling, converts a very complex problem into a model with numerical characteristics, that is, extracts the mathematical model contained in the problem and performs the same steps in a loop to finally obtain a problem.

Solving the problem by Monte Carlo method can be divided into three steps: first, construct the probability model. When the research object is not random, it is transformed into a random discrete event, and some parameters are constructed as the solution of the required problem; the second is to conduct random sampling. The random sequence is generated by the constructed probability process, and random sampling is performed from a large number of sequences generated; the third is to establish an estimator. Statistical methods are used to estimate the numerical characteristics of the model to determine a random variable as an approximate solution to the problem. The Monte Carlo method has the following advantages:

1. Through a large amount of simulation data, it can truly reflect the characteristics of the actual problem.
2. With the help of computer tools, the approximate solution of complex problems can be quickly obtained.
3. The program design is simple, and the convergence speed is fast.

3.6. Method Analysis of Weight Coefficients. There are relatively mature calculation methods for the calculation of the weight coefficient, among which the three methods of analysis hierarchy process, fuzzy comprehensive evaluation method, and Delphi method are the most widely used. The following three methods are selected and analyzed.

3.6.1. Analytic Hierarchy Process. AHP is a common method for calculating index weights, which can take into account both qualitative and quantitative analyses, and can calculate an index system with a certain level. The main idea is to establish a hierarchical structure that conforms to the design idea, convert the specific judgment values of experts into feasible data, and compare the importance of the indicators in pairs. The principle is to divide the indicators into several levels, and by constructing a judgment matrix, the importance order and weight of the lower level indicators relative to the upper level indicators are calculated. The advantage of AHP is that the calculation process is simple and clear. AHP can solve the research situation with strong subjectivity and lack of certainty, at the same time reduce the error in the process of determining the weight coefficient of each index, and is an effective method to solve the multi-
objective decision-making problem. At the same time, AHP can also carry out analysis and research on the consistency degree of expert thinking through consistency index.

3.6.3. Delphi Method. The Delphi method uses an anonymous method to repeatedly ask for expert opinions, and experts analyze, judge, and assign weight coefficients to the evaluation index system. The advantage is that it adopts the authoritative opinions of experts, which has certain authority, and at the same time, the weight collection is relatively simple, and its practicality and scientificity are relatively strong. The disadvantage is that due to the limitation of the number of experts, there may be problems of subjectivity, and the implementation process increases the workload.

The three methods mentioned above have their own characteristics and certain application environments, and we need to have a comprehensive understanding. The scope of application of AHP and Delphi method is roughly the same, but the Delphi method determines the weight coefficient entirely by subjective factors due to the lack of communication and communication between experts, which is highly subjective and low in accuracy. The AHP can effectively determine the order of each index to a certain extent, and the probability of the index coefficient being inconsistent with the actual importance of the index is low. Fuzzy comprehensive evaluation method is expressed by using fuzzy set for evaluation. This method has no direct affirmation or denial, it is not easy to determine the evaluation weight of a single index, and the steps are cumbersome. Therefore, this paper chooses AHP as the weight calculation method.

3.7. Calculation Steps of Weight Coefficient. In a natural ecosystem, the main biological components and environmental elements are not the same, and different biological components play different roles in the system, which are generally divided into producers, consumers, decomposers, and abiotic environments.

In the process of economic and social development, various energies and information transmissions are also constantly being carried out. Similarly, the operation law of innovation and entrepreneurship education ecology Xirong also conforms to the characteristics of the ecosystem.

The regional environment in which the ecosystem is located constitutes the abiotic environment of the system.

3.7.1. Determine the Indicator Architecture Level. The evaluation index system of innovation and entrepreneurship education ecosystem in colleges and universities can be divided into four layers, and each layer of indicators has a clear corresponding relationship with the upper layer indicators.

The first layer includes 2 factors, the state factor is A1, and the potential factor is A2; the second layer includes 7 elements, A11 represents the producer state factor, A12 represents the consumer state factor, A13 represents the decomposer state factor, and A21 represents the production state factor. A22 represents the consumer potential factor, A23 represents the decomposer potential factor, A24 represents the abiotic environment; A11 represents the next-level indicator of A11, A121 represents the next-level indicator of A12, and so on to get the total value of all indicators expressed.

3.7.2. Design the Judgment Matrix of Each Level. After determining the level of the evaluation index system, it is necessary to judge the relative importance of the index through the judgment matrix. In order to convert expert judgments into specific quantitative values, this study uses the difference comparison method and the Saaty scaling method to construct a judgment matrix.

3.7.3. Consistency Check. When the matrix order \( n \geq 3 \), a consistency check is required. This is because the knowledge and background of each interviewee are different, and the judgment matrix may have a certain deviation from the actual situation, so a consistency test must be carried out. When the calculation result of the consistency test is less than 0.10, it means that the judgment matrix is consistent, and the calculated weight coefficient is also valid; if the consistency test result is greater than or equal to 0.10, the judgment matrix consistency fails and needs to be re-consistent.

4. Results and Analysis

4.1. Results of Expert Consultation. 20 experts were selected from ten universities in a certain region to participate in the letter inquiries: among them, in terms of academic qualifications, 3 masters (15%) and 17 doctors (85%); and in terms of professional titles, 4 lecturers (20%), 10 associate professors (50%), and 6 professors (30%). There are 20 (75.86%) who have worked for \( \geq 10 \) years. All experts have close ties with the management and research of innovation and entrepreneurship education in colleges and universities.

Two rounds of expert consultation were conducted in this study. In the first round, 20 consultation letters were issued and 20 were recovered. The recovery rate was 100%, and the effective rate was 100%. The proportion of experts reached 60%; 20 questionnaires were distributed in the second round, 20 were recovered, the recovery rate was 100%, and the effective rate was 100%, indicating that the experts were highly motivated to participate in this research.
The Cs coefficient, Ca coefficient, and Cr coefficient of the experts are all at high values. This shows that the experts consulted are more authoritative, as shown in Figure 3. The Kendall’s W of the results of the first and second rounds of expert consultation were 0.73 (chi-square of 1200, $P < 0.001$) and 0.84 (chi-square of 1350, $P < 0.001$), respectively. The results are shown in Figure 4.

In this study, the indicators were revised and improved, the indicators in the second round were improved, and the Kendall’s W in both rounds was greater than 0.5, indicating that the degree of coordination among experts was relatively good.

Although experts are not fully coordinated, this may be caused by a variety of reasons, such as different backgrounds of experts, different understandings of the indicator system, and incomplete coordination due to the high degree of expert confidence. At the same time, there are too many indicators in the indicator system, which will also affect the degree of coordination in a certain sense.

From this, we can judge that after two rounds of consultation, the expert opinions are relatively concentrated, the coordination of expert opinions is good ($P < 0.001$), the results of the last round of consultation are desirable, and the evaluation index system of innovation and entrepreneurship education in colleges and universities can be determined.

4.2. Calculation Result of Weight Coefficient. The state factor index has three secondary indicators: producer state factor, consumer state factor, and decomposer state factor. According to the importance of expert consultation, the mean transformation value is assigned, the judgment matrix
is constructed, and the weight is calculated. The consistency test was carried out, and the results are shown in Table 1.

The state factor indicators have three secondary indicators: consumer potential factor, decomposer potential factor, and abiotic environment, the mean transformation value is assigned according to the importance of expert consultation, and the results are shown in Table 2.

The course state factor indicators have three subordinate indicators: the number of courses offered, the proportion of practical courses, and the course coverage rate. The judgment matrix is constructed, the weight is calculated, and the consistency test is carried out. The results are shown in Table 3.

### 4.3. Basic Information of the Respondents

The respondents came from 10 colleges and universities in a certain area, the colleges and universities covered double first-class colleges and universities, ordinary undergraduate colleges, and junior colleges, and the personnel distribution was relatively even; most of the respondents were male, accounting for 55.92%; the educational level was relatively extensive; the age was mainly concentrated in 18–25 years old, accounting for 90.31%; the roles of the respondents were relatively comprehensive, the number of respondents who had received entrepreneurship education was the largest, and the role distribution of the respondents is shown in Figure 5.

### 4.4. Analysis of Reliability Test Results

Internal consistency reliability reflects the degree of correlation between items in the questionnaire or scale. These items are different aspects of the same independent concept. This research uses this indicator to test the reliability. Cronbach’s coefficient represents the internal consistency reliability, and its value is between 0 and 1. As Cronbach’s coefficient increases, the previous correlation of each item in the scale or questionnaire becomes better. When Cronbach’s coefficient is greater than 0.8, it can be considered that the internal consistency reliability between the indicators is very good; its value is in the range of 0.6 to 0.8, indicating that the internal consistency reliability is good, and when its value is less than 0.6, it indicates that the internal consistency is poor.

This paper analyzes the scoring results of the respondents from 10 universities in a certain area. The overall Cronbach’s coefficient of the comprehensive evaluation index system constructed in this study is 0.87; Cronbach’s coefficient of the 15 secondary indicators is above 0.85, and the overall index is greater than each sub-indicator. It can be analyzed that the internal consistency reliability of the whole

### Table 1: Weights of subordinate indicators of state factors.

<table>
<thead>
<tr>
<th>Index</th>
<th>Producer state factor</th>
<th>Consumer state factor</th>
<th>Decomposer state factor</th>
<th>CR</th>
<th>CI</th>
<th>λ_max</th>
<th>W_i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer state factor</td>
<td>1/2</td>
<td>3</td>
<td>6</td>
<td>0.012</td>
<td>0.005</td>
<td>2.93</td>
<td>0.0802</td>
</tr>
<tr>
<td>Consumer state factor</td>
<td>1/4</td>
<td>2</td>
<td>1/3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decomposer state factor</td>
<td>1/7</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>0.1608</td>
</tr>
</tbody>
</table>

### Table 2: Weights of subordinate indicators of potential factor.

<table>
<thead>
<tr>
<th>Index</th>
<th>Consumer power factor</th>
<th>Decomposer potential factor</th>
<th>Abiotic environmental factors</th>
<th>CR</th>
<th>CI</th>
<th>λ_max</th>
<th>W_i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer power factor</td>
<td>1/3</td>
<td>6</td>
<td>4</td>
<td>0.038</td>
<td>0.032</td>
<td>3.92</td>
<td>0.2305</td>
</tr>
<tr>
<td>Decomposer potential factor</td>
<td>1/4</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abiotic environmental factors</td>
<td>1/2</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>0.2607</td>
</tr>
</tbody>
</table>

### Table 3: Weights of subordinate indicators of course state factors.

<table>
<thead>
<tr>
<th>Index</th>
<th>Number of openings</th>
<th>Proportion of practical courses</th>
<th>Course coverage</th>
<th>CR</th>
<th>CI</th>
<th>λ_max</th>
<th>W_i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of openings</td>
<td>1/4</td>
<td>2</td>
<td>1/3</td>
<td></td>
<td></td>
<td></td>
<td>0.3402</td>
</tr>
<tr>
<td>Proportion of practical courses</td>
<td>1</td>
<td>3</td>
<td>1/2</td>
<td>0.043</td>
<td>0.039</td>
<td>3.98</td>
<td>0.4607</td>
</tr>
<tr>
<td>Course coverage</td>
<td>5</td>
<td>6</td>
<td>1/6</td>
<td></td>
<td></td>
<td></td>
<td>0.2004</td>
</tr>
</tbody>
</table>

![Figure 5: The role distribution of the survey respondents.](image)

Innovation and entrepreneurship education teacher: 20.1%, College student entrepreneur: 47.82%, Students who have received entrepreneurship education: 13.9%, Other ordinary students: 18.19%
index system and the indexes is relatively good. The reliability test results are shown in Figure 6.

4.5. Analysis of Validity Test Results. Validity test mainly tests whether the questionnaire or scale is valid and whether it has a reasonable structure and convergence. This paper does not test the criterion-related validity. Because the content validity can reflect the results through the structural validity, that is to say, the reasonable structural validity means that the content validity is also relatively reasonable. At the same time, considering that the previous research has consulted relevant experts, the content of the index system has been recognized by experts, and the content is effective. There is a good guarantee for the validity of the test content in this paper, and no specific analysis and research on the content validity will be carried out, because the structural validity of the important research analysis can ensure that the content validity meets the requirements. The specific validity analysis methods are exploratory factor analysis and confirmatory factor analysis, and the test contents include the construct validity, convergent validity, and discriminant validity of the index system.

The approximate chi-square value of the Bartley sphericity test is $18578.1$, the degree of freedom is $1422$, the $P$ value is $0.001$, which is less than $0.01$, and it has passed the significance test with a significance of $1\%$. It can be seen that the learning investment scale data are very suitable for factor analysis. Under different inverse parameter ratios, the KMO metric values are shown in Figure 7. It can be seen from
5. Conclusion

This study believes that the ecological development of entrepreneurship education in colleges and universities means that college entrepreneurship education achieves its own comprehensive, systematic, coordinated, and sustainable development through the balanced development of various elements in its own system and the interaction between the system and the environment. The entrepreneurship education ecosystem in colleges and universities is aimed at cultivating pioneering talents and is a self-regulation composed of “substantial elements” such as multiple subjects, objects, mediators, and rings. The system emphasizes relationship adjustment in the macro-structure, internal governance in the meso-structure, and classroom teaching in the micro-structure. This paper proposes a random matrix theory method that uses Monte Carlo simulation to simultaneously modify the lower bound and upper bound at the same time through a large number of simulation data, so as to realize the accurate determination of the range. The index elements of the comprehensive evaluation of the innovation and entrepreneurship education ecosystem in colleges and universities are clarified. We summarize the existing research results on the comprehensive evaluation of innovation and entrepreneurship education ecosystem, take the ecological theory and niche situation theory as the guide, clarify the key elements that affect the evaluation of innovation and entrepreneurship education in colleges and universities, and classify the evaluation elements according to the basic composition categories of the ecosystem from a system. With the help of the idea of niche situation theory, the connotation of key elements is analyzed, that is, which “explicit” indicators and “invisible” indicators are included in each element. The weight assignment of the evaluation index system is realized, which lays the foundation for the quantitative evaluation. The analytic hierarchy process is used to determine the weight coefficients of the indicators at all levels, and the importance of the indicators is judged by the weight coefficients to achieve a scientific and quantitative evaluation of the innovation and entrepreneurship education ecosystem. The research results provide a reference for the future comprehensive evaluation practice of the innovation and entrepreneurship education ecosystem in colleges and universities, and also provide new theoretical references and ideas for future related researchers.

Data Availability

The data used to support the findings of this study are available from the author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest or personal relationships that could have appeared to influence the work reported in this paper.

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