

Research Article

Construction of Entrepreneurial Environment for College Graduates Based on Big Data Technology

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Received 22 June 2022; Revised 23 July 2022; Accepted 26 July 2022; Published 26 April 2023

Academic Editor: Kalidoss Rajakani

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The 21st century is the era of big data. The wide application of big data in various fields of society has triggered changes in all walks of life, and it has also brought new opportunities and challenges to the cultivation of talents in colleges and universities. The entrepreneurial environment has a strong influence on entrepreneurial activities, and the choice of entrepreneurial environment plays an important role in college students' entrepreneurship. College students' entrepreneurship is carried out in a certain environment, and the quality of the entrepreneurial environment will directly affect the effectiveness of college students' entrepreneurial activities. Under the background of the development of the Internet economy, college students have more ways to start their own businesses. With the support of big data, the types, methods, and performance evaluation of college students' entrepreneurship can be evaluated based on the effective application of big data. Big data is an important means of constructing an environment for innovation and entrepreneurship. In order to solve the problems of "information island" and low data utilization in the existing innovation and entrepreneurship information platform in colleges and universities, we use big data technology to break the data island and integrate multichannel, multilevel, and multitype data, so as to build a perfect university. The entrepreneurial environment of graduates is of great significance.

1. Introduction

2015 was defined as the starting point of the fourth entrepreneurial tide in China. At the two sessions, Premier Li Keqiang proposed to build "mass entrepreneurship and innovation" into a "dual engine" to promote China's economy and proposed to speed up the development of new entrepreneurial service platforms such as "mass entrepreneurship space," so as to create a good ecological environment for innovation and entrepreneurship [1]. The entrepreneurial environment has a very important impact on college students' entrepreneurship. Under the increasingly severe social background of college students' employment situation, taking effective measures to create a good environment for college students' entrepreneurship plays a very important role in promoting college students' entrepreneurship and driving their employment. China's education

originally lacks of entrepreneurship education. Chinese students not only have weak economic ability to bear risks but also have poor psychological quality to bear setbacks, which makes independent entrepreneurship a risky employment path that few people pay attention to. Big data technology is used to break the data islands and integrate multichannel, multilevel, and multitype data to build the entrepreneurial environment of college students is particularly necessary [2]. As shown in Figure 1, with the subject's needs as the core, data circulation as the carrier, and comprehensive evaluation as the guide, the activities of a subject drive other subjects to link up, promote a virtuous circle of the entire system, and improve efficiency and effectiveness [3]. Constructing the entrepreneurial environment of college students is in line with the inherent requirements of an innovative country, scientific development concept, and ecological civilization [4].

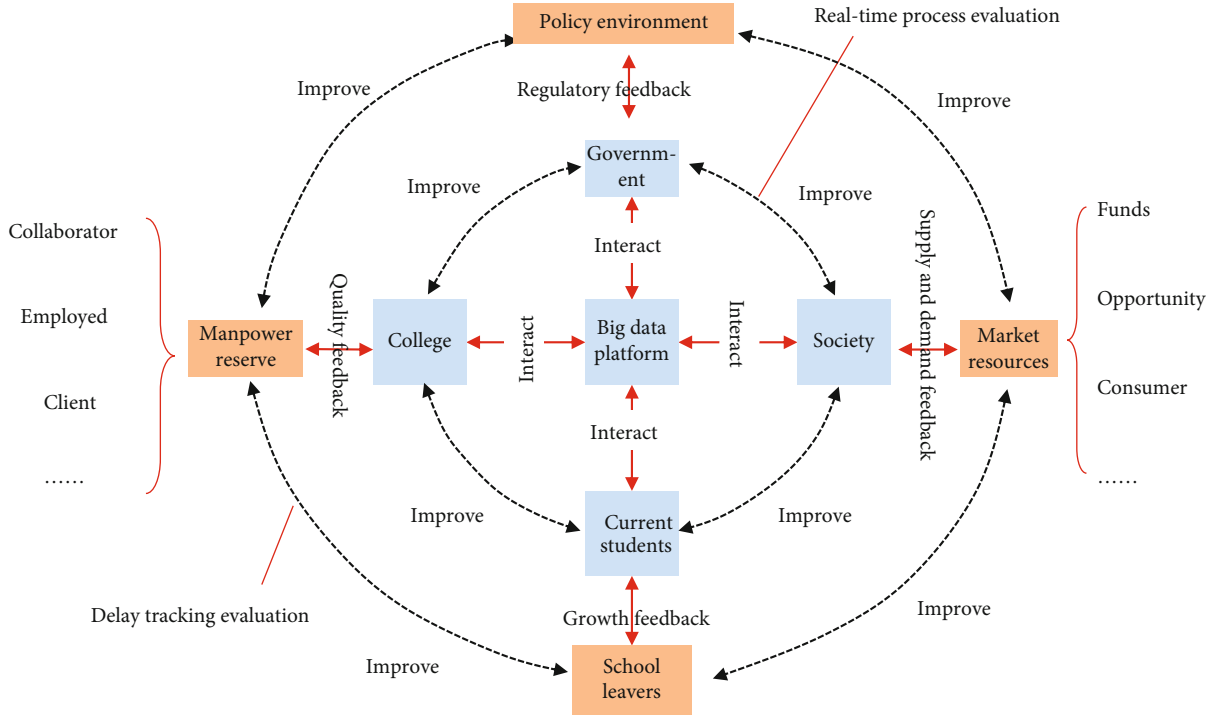


FIGURE 1: The linkage mode of college students' entrepreneurial environment.

An important sign of the information age is that all judgments are mainly based on data, and informatization has occupied the main body of political and economic life with the requirements of large scale, high speed, diversification, and value [5]. The modern economy uses data to make decisions, uses data to manage, and uses data to innovate and realizes the advantageous role of modern entrepreneurship and development. Under the background of big data, college students' entrepreneurship has obvious advantages, and the entrepreneurial structure of college students is more in line with the requirements of modern business. Big data has attracted more and more attention in the current society because of its large number, many types, wide benefits, and high speed. Most industries in society are gradually planning data to predict the future trend of the form. In today's society, big data has become the mainstream of the times. According to incomplete statistics, the employment trend of college graduates is close to big data. The emergence of big data is a great opportunity and challenge for college students to innovate and start businesses. College student entrepreneurs can effectively combine with their own ideas in the use of information resources under the new business model. Under the background of modern business, the business model of college students' entrepreneurship is more balanced, the information resources are more symmetrical, and the entrepreneurial mechanism is more in line with the requirements of marketization. In the process of college students' entrepreneurship, various contradictions of traditional entrepreneurship have been avoided, and the advantages of modern economy have been used. College students have made new progress in entrepreneurial subjects, entrepreneurial methods, and entrepreneurial application capabilities. The

industrial chain under the background of big data has formed a new business model with the value chain, which gives college students more resources and marketing tools for entrepreneurship [6]. College students are the core subject of higher education. Under the premise of data application, they can have more intelligent development in the process of entrepreneurship, and college students' entrepreneurship can be more easily integrated into the mainstream of social entrepreneurship development, making entrepreneurial activities have more strategic and meaningful development.

2. State of the Art

2.1. *Research on Entrepreneurship of College Students.* The entrepreneurial environment is not composed of a single element, it is a collection of a series of elements that act on the entrepreneurial process. At present, the conceptual definition of the entrepreneurial environment presents various characteristics. For example, in organizational theory, there are two viewpoints on the conceptual definition of the entrepreneurial environment [7]. At present, the academic circles mainly refer to three authoritative research models when establishing the entrepreneurial environment index system, namely, the five-dimensional model, the global entrepreneurial observation model (GEM model), and the MOS model [8]. The five-dimensional model was first proposed by Gnyawali and Fogel. As shown in Figure 2, they decomposed the entrepreneurial environment into government policies and regulations, living economic conditions, entrepreneurial and management skills, financial support for entrepreneurship, and nonfinancial support for entrepreneurship. There are five first-level dimensions and 33 second-level dimensions, which

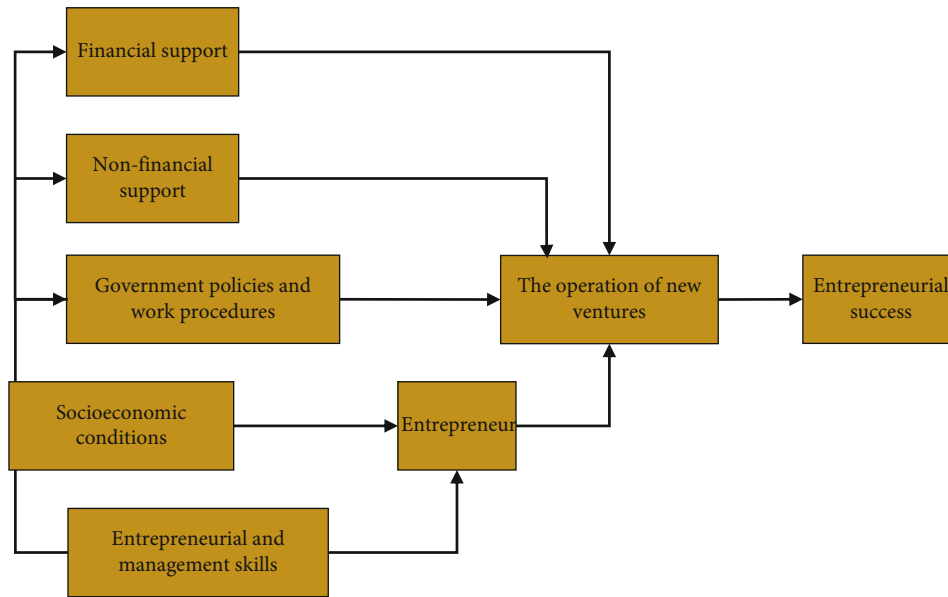


FIGURE 2: Five-dimensional model of entrepreneurial environment.

comprehensively construct an index system for the entrepreneurial environment [9].

The MOS model, proposed by Lundstrom and Stevenson, is based on the “opportunity theory” and focuses on the entrepreneurial policy in the entrepreneurial environment [10]. They build an entrepreneurial policy indicator system around the three elements of motivation, opportunity and skills, including six contents: promote entrepreneurial culture, develop entrepreneurial education, reduce barriers to entry, start-up capital/financial support, business support, and stimulate target groups [11]. Foreign scholars have also conducted related research on the entrepreneurial environment. Porter (1980) proposed to evaluate the entrepreneurial environment from five aspects: entry barriers, the competitive state of existing competitors, the threat of alternative products, the bargaining power of buyers, and the bargaining power of suppliers; Gartner (1995) evaluated the entrepreneurial environment from five aspects: the high proportion of recent immigrants in the population, large-scale urban areas, strong industrial foundation, the availability of financial resources, and the degree of industrial specialization. Segui-Mas, Elie took the 2004-2016 “Global Entrepreneurship Observation Report” as the data source, used bibliometrics to conduct a comprehensive study of the entrepreneurial environment, identified the main research authors and journals of the entrepreneurial environment, and was the primary research scholar of the entrepreneurial environment to provide research experience and theoretical guidance [12]. Through the method of questionnaire survey, Shen proved that the entrepreneurial environment formed in colleges and universities provided an additional opportunity for the cultivation of students’ professional ability and also described the entrepreneurial environment’s ability to determine students’ self-determination from both theoretical and practical aspects and its impact on the adaptability of professional activities [13].

When domestic scholars conduct research on the entrepreneurial environment, most of them use the five-dimensional model, the global entrepreneurial observation model (GEM model), and the MOS model as the theoretical basis to construct the entrepreneurial environment index system [14]. Chen Zhangwang and Ke Yuzhen focused on the comparison of the entrepreneurial environments of Fujian and Taiwan and to understand the regional characteristics of the entrepreneurial environment. Based on the three major models, combined with the relevant data of the 2016 statistical yearbook of Fujian and Taiwan, the entrepreneurial environment, the first-level indicators are set as government (authority) support, industrial development, talent environment, research and development environment, financial support, and market environment, and on this basis, eleven second-level indicators are set, and then, the threshold method is adopted. The weight of each indicator is calculated, and the indicators that have a deep impact on entrepreneurship in the entrepreneurial environment are pointed out and suggestions are made [15]. Mei Qiang, Xu Zhandong and others took the entrepreneurship education environment as the research focus, and focused on the university environment. Using the five-dimensional model and the global entrepreneurship observation model (GEM model) as the theoretical basis, they used the expert survey method to score various indicators. We established the evaluation index system of innovation and entrepreneurship education environment in colleges and universities, obtained nine first-level indicators and fifty-seven second-level indicators, and then used the analytic hierarchy process to calculate the masses of each index and put forward improvement suggestions based on this [16]. Based on the reality of innovation and entrepreneurship education in colleges and universities and the research results of predecessors, this article proposes a more comprehensive and broader evaluation index system for innovation and entrepreneurship

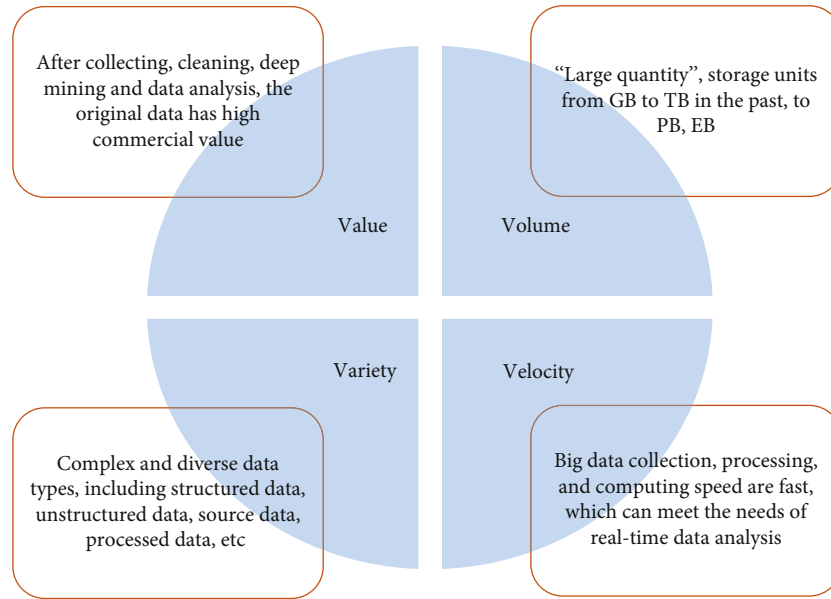


FIGURE 3: 4V characteristics of big data.

education environment. Based on the MOS model, Jiang Ying and Ou Jinmei matched the three elements in the model with the influencing factors of college students' entrepreneurship; constructed a framework of influencing factors of entrepreneurial awareness, entrepreneurial knowledge, entrepreneurial resources, and environment; and focused on entrepreneurial policies. The system is decomposed, and a systematic analysis of college students' entrepreneurial policies will be carried out [17]. In addition, based on ecology, Yan et al. expounds the concept of the entrepreneurial ecosystem environment and divides the entrepreneurial ecosystem into several aspects: the entrepreneurial facility ecological environment, the entrepreneurial cultural ecological environment, the entrepreneurial technology ecological environment, and the entrepreneurial financial ecological environment [18]. Yan focused on the entrepreneurial environment of the city. Based on the PSR model, he analyzed the pressure impact of the urban economy and social environment on the entrepreneurial environment, the state of the entrepreneurial environment after being stressed, and the responses of the government and social organizations. The pressure-state-corresponding entrepreneurial environment evaluation model selects 18 indicators and uses the entropy weight method to calculate the weight of each index to provide a reference for improving the urban entrepreneurial environment [19].

2.2. Big Data Technology. The current industry-recognized big data has the characteristics of "4V" (as shown in Figure 3), among which volume refers to the large scale of the data set. Generally, the amount of data should reach the scale of more than 10TB, and in practice, it will also reach the FB level. There is no specific numerical definition for the volume of the data, and the volume is relatively large. Velocity refers to the fast data flow and processing speed. Due to the large volume of data, a large amount of new data

can be generated in real time and quickly, and the data format is diverse [20].

2.3. Entrepreneurial Environment Based on Big Data. Big data technology breaks the data silos; integrates multichannel, multilevel, and multitype data; and provides technical support for college students' entrepreneurial behavior. The introduction of big data technology in the construction of college students' entrepreneurial environment has obvious advantages and necessity, which are mainly reflected in the following three aspects:

One is to dynamically grasp the development status of entrepreneurial entities. Relying on big data technology, it can solve the problem of dynamic tracking of the development status of entrepreneurial enterprises by service entities such as entrepreneurial service platforms. Through the data connection and sharing mechanism, information barriers can be effectively broken. On the basis of a large amount of effective data, the key data of entrepreneurial enterprises conducts analysis to gain an in-depth understanding of the development status of entrepreneurial enterprises, finds business difficulties and problems, and provides corresponding entrepreneurial assistance services in a targeted manner.

The second is to precisely match the service needs of entrepreneurial entities. The integration of data resources by big data provides richer analysis materials to a certain extent. Entrepreneurial service entities such as incubators and entrepreneurial service platforms can analyze the commonality and characteristics of entrepreneurial enterprises and summarize the corresponding enterprises with specific attributes and different needs. Big data analysis technology can deeply extract and summarize key information and data and assist entrepreneurial service entities to make accurate judgments. E-commerce recommends the goods we want, search engines provide personalized sorting, educational institutions provide targeted education and training

according to personal needs, financial institutions help users with effective financial management or provide loan services, and enterprises obtain customers' online records in real time through technical support and provide customized services for them in a timely manner. In the past, entrepreneurs may look for potential consumers after producing products, but in the era of big data, entrepreneurs may push back to product production based on demand.

3. Methodology

The diversification of the definition of entrepreneurship is due to the complexity of the entrepreneurial phenomenon itself, which involves a series of issues such as change, innovation, environmental changes, development of new products, entrepreneurs, and industrial development; on the other hand, it is due to researchers. They are in different disciplines, and they conduct research on entrepreneurial activities from the level of individual entrepreneurship or from the level of corporate entrepreneurship. The entrepreneurial environment has a strong influence on entrepreneurial activities, and the choice of entrepreneurial environment plays an important role in college students' entrepreneurial period [21].

3.1. Entrepreneurial Environment. The entrepreneurial process of an enterprise is neither driven by a certain aspect, nor is it only the result of a certain factor; its operation requires the support of all aspects of the environment. Entrepreneurial environment refers to a series of external factors and the organic whole that have an impact on the entrepreneur during the entire process of establishing an enterprise. The main body of the entrepreneurial environment is the carrier of the entrepreneurial environment, such as government departments and intermediaries, and the function is the role that the environmental main body plays on the entrepreneurial enterprise [22]. There is a mapping relationship between environmental subjects and environmental elements. If the functions are explained in combination with environmental elements, it can be considered that the influence of environmental elements on entrepreneurial enterprises is the external manifestation of the functions provided by environmental subjects. The entrepreneurial environment has the characteristics of overall influence, environmental variability, regional differences, and relative dominance in the process of influencing entrepreneurial activities. Therefore, it is particularly necessary to evaluate and improve the pertinence of the entrepreneurial environment.

3.2. Entrepreneurial Environment Evaluation Method

3.2.1. The Basic Idea of Factor Analysis. The mathematical model of R-type factor analysis is as follows:

$$\begin{cases} X_1 = a_{11}F_1 + a_{12}F_2 + \cdots + a_{1m}F_m + \varepsilon_1, \\ X_2 = a_{21}F_1 + a_{22}F_2 + \cdots + a_{2m}F_m + \varepsilon_2, \\ \cdots \\ X_p = a_{p1}F_1 + a_{p2}F_2 + \cdots + a_{pm}F_m + \varepsilon_p, \end{cases} \quad (1)$$

and satisfy formulas (2)–(5):

$$m \leq p, \quad (2)$$

$$\text{Cov}(F, \varepsilon) = 0, \quad (3)$$

$$D(F) = \begin{bmatrix} 1 & & 0 \\ & \ddots & \\ 0 & & 1 \end{bmatrix} = I_m, \quad (4)$$

i.e., F_1, F_2, \dots, F_m are uncorrelated and have variance 1.

$$D(\varepsilon) = \begin{bmatrix} \delta_1^2 & & 0 \\ & \delta_2^2 & \\ 0 & & \delta_p^2 \end{bmatrix} = I_m. \quad (5)$$

Among them, directly obtained by observation, the resulting P -dimensional random vector composed of P indicators:

$$F = (X_1, X_2, \dots, X_p)'. \quad (6)$$

Unobservable vectors (common factors extracted by factor analysis) can be expressed as

$$F = (F_1, F_2, \dots, F_m)'. \quad (7)$$

Among them, a_{ij} is called factor loading, that is, the loading of the i th variable on the j th common factor; P is a special factor of X ; and the covariance matrix of ε is theoretically a diagonal matrix.

The common factor reflects the correlation between the original variables. Using the common factor to represent the original variable will be more conducive to describing the characteristics of the research object. Therefore, it is necessary to express the common factor as a linear combination of variables, namely,

$$F_j = \beta_{j1}X_1 + \cdots + \beta_{jp}X_p, j = 1, \dots, p. \quad (8)$$

The above formula is the factor score function, which can be used to calculate the common factor score of each sample. The mathematical model of factor analysis is to represent variables as linear combinations of common factors:

$$X_i = \alpha_{i1}F_1 + \cdots + \alpha_{im}F_m, i = 1, \dots, p. \quad (9)$$

According to the level of factor scores, each factor can be sorted, key factors can be found, and then, targeted management measures can be proposed.

3.2.2. *Calculation Steps of Factor Analysis Method.* Take the following raw data as an example to illustrate the calculation steps of factor analysis:

- (1) Standardize the original data and record it as x_{ij}
- (2) Establish the correlation coefficient matrix of variables $R = (r_{ij})_{p \times p}$, where

$$r_{ij} = \frac{\sum_{a=1}^n (x_{ai} - \bar{x}_i)(x_{aj} - \bar{x}_j)}{\sqrt{\sum_{a=1}^n (x_{ai} - \bar{x}_i)^2} \sqrt{\sum_{a=1}^n (x_{aj} - \bar{x}_j)^2}} = \frac{1}{n} \sum_{a=1}^n x_{ai} \bullet x_{aj} \quad (10)$$

- (3) Find the eigenvalues of R and the corresponding unit eigenvectors, which are recorded as

$$\lambda_1 \geq \lambda_2 \geq \dots \lambda_p \geq 0, \quad (11)$$

$$U = (u_1, u_2, \dots, u_p) = \begin{bmatrix} u_{11} & u_{12} & \dots & u_{1p} \\ u_{21} & u_{22} & \dots & u_{2p} \\ \dots & \dots & \dots & \dots \\ u_{p1} & u_{p2} & \dots & u_{pp} \end{bmatrix} \quad (12)$$

Sorting according to the ratio of the cumulative contribution rate, the calculation formula of the cumulative contribution rate can be expressed as

$$c_i = \frac{\sum_{i=1}^m \lambda_i}{\sum_{i=1}^p \lambda_i}. \quad (13)$$

Then, according to the sorting result, take the first m eigenvalues (in actual operation, the eigenvalues greater than 1 are generally taken) and the corresponding eigenvectors to write the factor loading matrix:

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1m} \\ a_{21} & a_{22} & \dots & a_{2m} \\ \dots & \dots & \dots & \dots \\ a_{p1} & a_{p2} & \dots & a_{pm} \end{bmatrix} = \begin{bmatrix} u_{11} \sqrt{\lambda_1} & u_{12} \sqrt{\lambda_2} & \dots & u_{1p} \sqrt{\lambda_m} \\ u_{21} \sqrt{\lambda_1} & u_{22} \sqrt{\lambda_2} & \dots & u_{2p} \sqrt{\lambda_m} \\ \dots & \dots & \dots & \dots \\ u_{p1} \sqrt{\lambda_1} & u_{p2} \sqrt{\lambda_2} & \dots & u_{pp} \sqrt{\lambda_m} \end{bmatrix} \quad (14)$$

- (4) Perform a maximum variance orthogonal rotation on A

- (5) Calculate the scores of each factor, and sort them, and finally determine the degree of influence of different factors on the event according to the different factor scores

3.3. *Calculation of Entrepreneurial Environment Policy Coupling Degree.* The so-called college students' entrepreneurship policy refers to the national or regional policies on College Graduates' entrepreneurship, including industrial and commercial administration registration, loans, tax collection, training and guidance, project promotion, and business management, which are part of the citizens' entrepreneurship policy. In order to better examine the synergy between relevant entrepreneurial environment policies through the content of college students' entrepreneurial policies, this paper makes a quantitative investigation from three dimensions of policy strength, policy measures, and policy goals based on the research of Zhang Wei and others. Policy measures are the policy tools used by government departments to achieve the established goals of policies. This paper subdivides the policy measures into three aspects: fiscal and taxation measures, administrative measures, and personnel measures, and quantifies them.

Policy goals reflect the purpose of a certain policy. This paper mainly evaluates relevant policies from the perspectives of innovation and entrepreneurship ability, economic benefits, and employment performance.

Let U_i be the order parameter of system i , U_j be the order parameter of system j ($i \geq 2, j \geq 1$), U_{ij} be the basic observation index inside the system U_i, U_j , and be the efficiency value of the subsystem composed of indexes (m is the composition). The number of indicators can be expressed as

$$U_i = \sum_{j=1}^m \lambda_{ij} u_{ij}. \quad (15)$$

λ_{ij} is the weight of each index. According to the n -dimensional system interaction function,

$$C_n = n \left(\frac{U_1 U_2 \dots U_n}{\prod (U_i + U_j)} \right)^{1/n}. \quad (16)$$

It can be concluded that the interaction function of the 3D system after dimensionality reduction is

$$C_3 = 3 \left(\frac{U_1 U_2 U_3}{(U_1 + U_2 + U_3)^3} \right)^{1/3}. \quad (17)$$

The coupling coordination function is established as

$$\begin{cases} T = aU_1 + bU_2 + cU_3, \\ D = (CT)^k. \end{cases} \quad (18)$$

TABLE 1: Sample coverage rate of entrepreneurial environment in different types of colleges and universities.

College category	Total	Number of coverage	Coverage
Overall	831	567	68.2%
First-class university construction university	42	33	78.6%
First-class discipline construction colleges and universities	98	75	76.5%
General undergraduate colleges and universities	689	460	66.8%

In Equation (18), D is the value of the coupling degree we seek, C is the value of the coupling degree found in Equation (2), and a , b , and c are undetermined coefficients. Generally, in a 3-dimensional system, the value of k is $1/3$. From the perspective of contribution to the total system, the three subsystems are equally important, so take $a = b = c = 1/3$, so choose a , b , and c to take value $1/3$.

4. Result Analysis and Discussion

In order to investigate the evaluation method of college students' entrepreneurial environment proposed in this paper, measure the degree of coupling between various influencing factors, and facilitate the construction of college students' entrepreneurial environment based on big data, the algorithm is verified by empirical analysis. And coupling degree analysis puts forward the realization path of college students' entrepreneurial environment construction based on big data.

4.1. Data Sources of Entrepreneurial Environment Evaluation. The data used in this study are mainly from the "Employment Quality Report" of various universities. In accordance with the requirements of the Ministry of Education, colleges and universities have successively released employment quality reports since 2013, introducing the overall employment status of graduates in that year, including the number, composition, and whereabouts of graduates. According to the 2019 National Colleges and Universities List of the Ministry of Education, the 2018 employment quality reports of 831 nonprivate undergraduate colleges and universities (see Table 1) were retrieved, downloaded, and encoded, using crawler technology, through the acquisition, screening, and data preprocessing of the above resources.

The independent variables cover the two levels of colleges and universities and the cities where the colleges are located. The independent variables at the college level mainly include college category and college type. The categories of colleges and universities are divided into three categories: first-class universities, first-class disciplines, and general undergraduate colleges; colleges are divided into comprehensive, engineering, agriculture, forestry, medicine, normal, language, finance, politics and law, sports, art, and ethnic types. The independent variable at the city level where the university is located is mainly the urban entrepreneurial environment, which is represented by the number of venture capital in the city in 2018. The larger the number of venture capital, the more active the venture capital and entrepreneurial activities in the city, which can be used as a measure of the urban entrepreneurial environment.

The control variables are also divided into two levels: colleges and universities and the cities where the colleges are located. The control variables at the college level mainly include the scale of colleges and universities, the proportion of undergraduate graduates entering higher education, and the ratio of going abroad/going abroad (hereinafter referred to as the "progression rate"). College size is expressed using the number of undergraduate graduates. The rate of further studies can represent the opportunity cost of starting a business, because college students are faced with different choices such as further education, going abroad/going abroad, working, and starting a business. Choosing to start a business means giving up other options. This research analyzes the relevant data of the employment quality report and finds that there are large differences in the rate of further studies in different types of colleges and universities; the average proportion of undergraduates who choose to go to college or go abroad/go abroad is 54.14%, in the first-class universities and colleges is 15.92% which is more than triple.

It can be seen from Figures 4 and 5 that during the initial start-up period, college students mainly take the form of partnership and independent initiation, and the scale of the enterprise is relatively small. In the industry field, it mainly focuses on education, digital IT, computer, and service industries. These industries can rely more on human capital, some of which can be combined with their own majors, and have relatively low requirements for other resources (such as funds and venues).

According to the university database of <http://xuexin.com>, the types of Chinese universities can be divided into 12 types, including comprehensive, engineering, normal, and finance and economics. The ranking of the average entrepreneurial rate of undergraduate graduates in different types of colleges and universities is shown in Figure 6.

As can be seen from Figure 7, the average entrepreneurial rate of college graduates in sports and arts is the highest. The reason may be that sports and art graduates can rely more on human capital when starting a business and have relatively low requirements for other resources (such as funds and venues).

4.2. Analysis of the Results of College Students' Entrepreneurial Environment. We use the factor analysis method proposed in Section 3 to analyze the obtained employment data and compare the overall entrepreneurial rate involving college graduates, as well as the entrepreneurial rate of graduates with different educational backgrounds and different types of colleges and types, and then conduct a multivariate analysis of entrepreneurial environments (linear regression analysis).

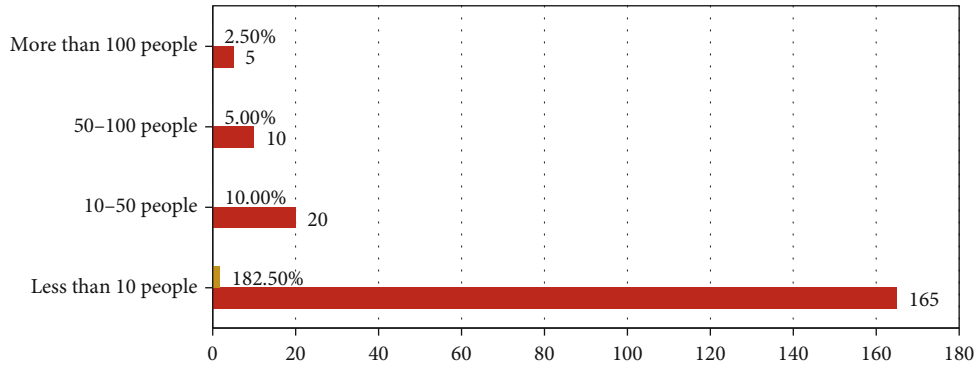


FIGURE 4: The scale of college graduates' entrepreneurial enterprises.

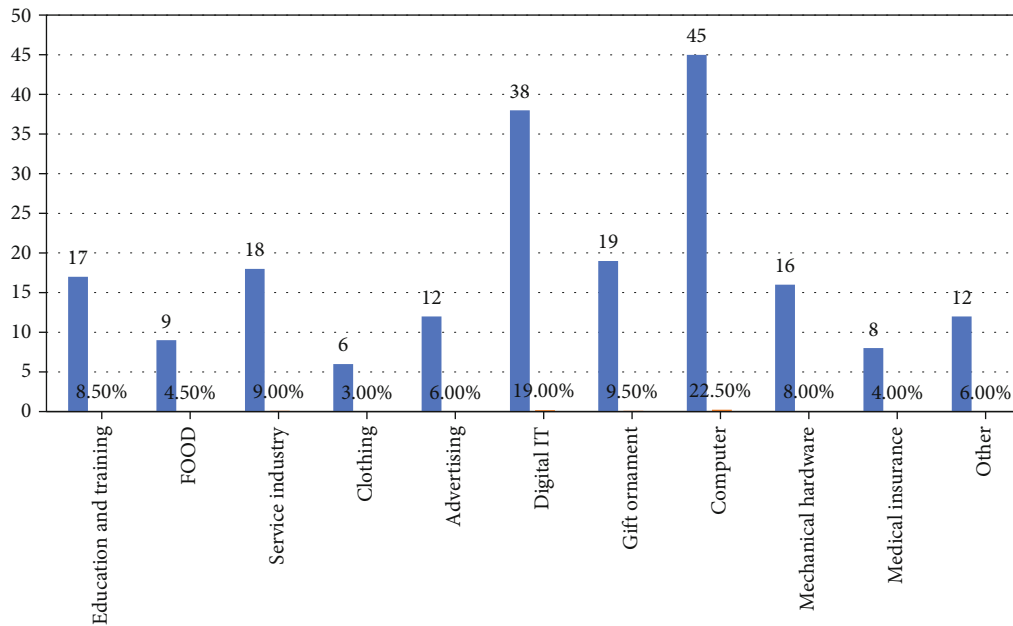


FIGURE 5: Industry distribution of college graduates' entrepreneurial enterprises.

The evaluation model of college students' entrepreneurship environment includes five subdimensions of government, colleges and universities, financial institutions, entrepreneurship training institutions, and social networks. Confirmatory factor analysis was carried out using the structural equation method, and the analysis model is shown in Figure 7.

By calculating the coupling degree between different influencing factors, the degree of influence of different factors on the entrepreneurial environment can be analyzed. Taking the coordination of policy strength, policy measures, and policy objectives as an example, the results shown in Table 2 can be obtained.

From 2011 to 2020, the coordination level of the three systems of policy strength, policy measures, and policy objectives fluctuated greatly in different years, but the overall trend was declining, as shown in Figure 8. This shows that the policy coordination level formulated by the local government in the past ten years is insufficient, and it has failed to effectively promote employment through innovation and

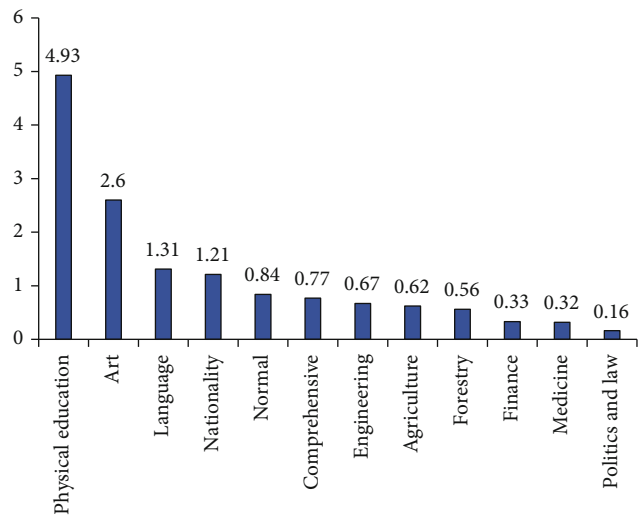


FIGURE 6: The average entrepreneurial rate of undergraduate graduates of different types of colleges and universities.

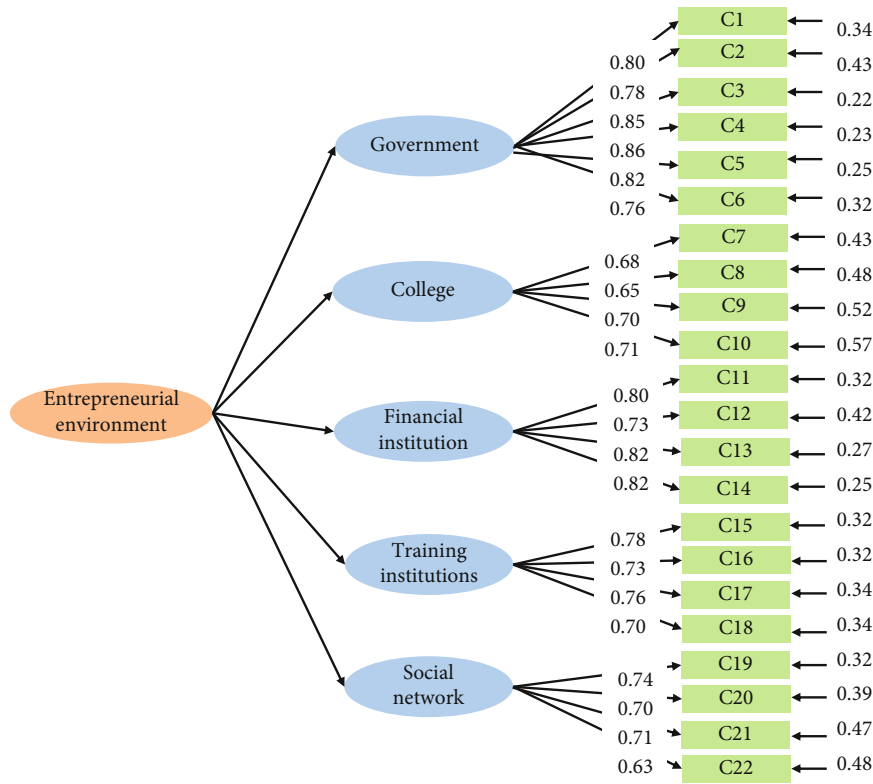


FIGURE 7: Weight coefficients of elements of college students' entrepreneurial environment.

entrepreneurship. Due to the low degree of synergy between policy measures and policy objectives, the degree of synergy among the three systems is maintained at a moderate level, and the synergistic effect of policy synergy among the three types of system policies of policy strength, policy measures, and policy objectives has not been achieved, and the most perform its intended function well.

4.3. Construction Path of College Students' Entrepreneurial Environment Based on Big Data

4.3.1. *The Core Idea of Entrepreneurship Service System Based on Big Data.* To carry out entrepreneurship education for college students and form an entrepreneurial culture is by no means a problem of cultivating a few small bosses, but to cultivate a large number of leaders with entrepreneurial spirit and entrepreneurial ability among college students, so that they can become a new force to create social wealth and promote sustainable economic development. Based on big data, cloud computing, and other technologies, the construction of entrepreneurial environment can achieve more precise positioning, faster and more convenient, and more suitable for needs. The entrepreneurial environment built around big data should run through all stages of entrepreneurship to achieve complete data acquisition, collection mechanism, and a full range of entrepreneurial assistance services. According to the nature, functional differences and interrelationships among the elements involved in entrepreneurship and innovation education in colleges and universities, a collaborative matrix model can be constructed

TABLE 2: Analysis of the coordination degree of policy strength, policy measures, and policy objectives.

Time	Policy strength-policy measures	Policy measures-policy strength	Policy objectives-policy strength	Three systems
2011	0.6737	0.7471	0.6957	0.7171
2012	0.6499	0.6777	0.7083	0.6983
2013	0.6648	0.6156	0.6212	0.6965
2014	0.7084	0.7466	0.7213	0.7282
2015	0.5682	0.5682	0.7370	0.6579
2016	0.6345	0.6377	0.7335	0.6829
2017	0.6482	0.6581	0.7210	0.6848
2018	0.6446	0.6682	0.7393	0.7081
2019	0.6246	0.6435	0.7281	0.6525
2020	0.5832	0.5854	0.7345	0.6532
Average	0.6400	0.6548	0.7140	0.68795

horizontally and vertically based on big data (as shown in Figure 9 below). The vertical elements are subjects, projects, mentors, resources, and utility, and the horizontal elements are students, universities, social institutions, and the government. On the one hand, these elements run on a unified big data platform and are related to each other through data. From any element, other relevant elements that can be matched can be quickly found. Point to point and interact and interact are in the process of entrepreneurship education practice, organic fusion. On the other hand, the roles

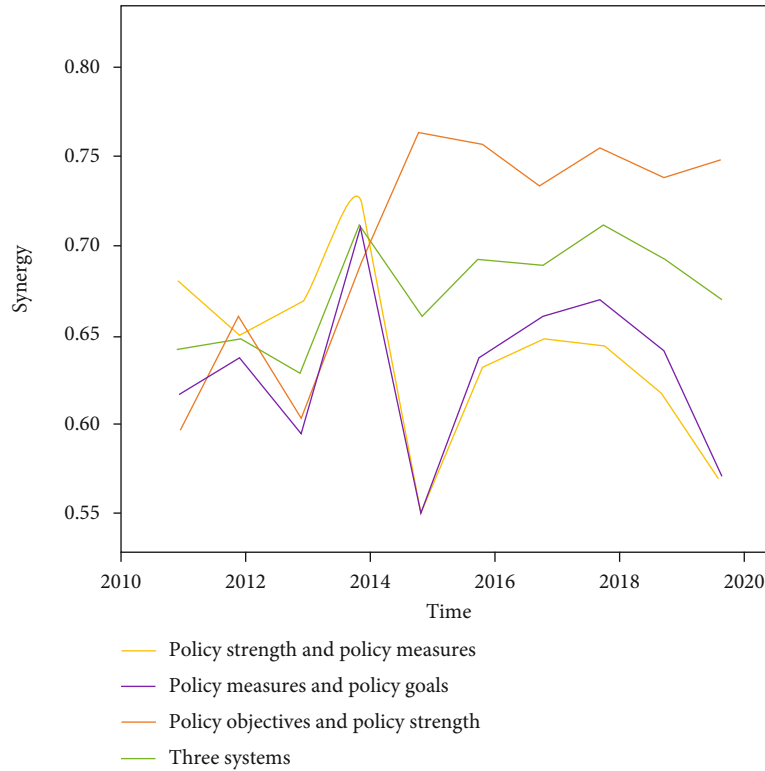


FIGURE 8: Analysis of the coordination degree of three types of system policies.

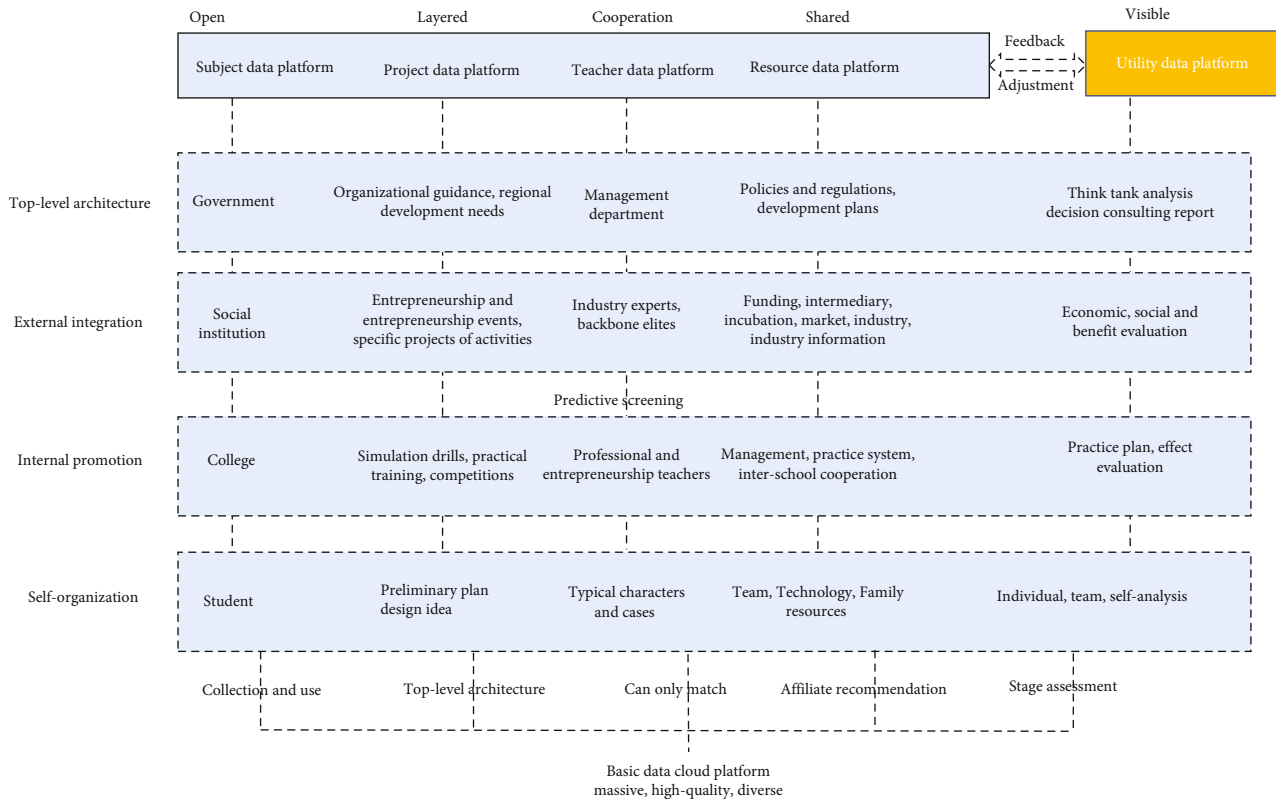


FIGURE 9: Entrepreneurial environment based on big data technology.

played by each subject are progressive, and the norms are gradually improved to form a three-dimensional system from organization (students), internal promotion (universities), and external integration (social institutions) to the top-level structure (government). Collaborative management and collaborative work of the entrepreneurship and innovation education practice system were observed.

Building an entrepreneurial environment based on big data should include the following three links.

One is data collection and integration. This is the basis for the construction of an entrepreneurial environment. It mainly acquires data and information through application scenarios such as entrepreneurial service platforms, incubators, media platforms, relevant professional service agencies, and relevant departments, so as to establish an information database for entrepreneurial enterprises.

The second is data processing and analysis. Through cloud computing, data mining, and statistical technology, the data is screened, processed, and analyzed, which determines the grasp of the specific situation of the service object and the choice of entrepreneurial services. At this stage, it is necessary to label and integrate the data information of start-up enterprises and to provide a basis for subsequent service provision.

The third is data services. This is the link that is implemented into entrepreneurial services based on data analysis. The setting of this link needs to consider the method, content, objects, and expected effects of entrepreneurial services. It is the improvement and extension of traditional entrepreneurial services.

4.3.2. Specific Measures to Build an Entrepreneurial Environment. To build a comprehensive entrepreneurial environment for college students, it mainly starts from the whole process of entrepreneurial activities and distinguishes between the entrepreneurial preparation stage, the entrepreneurial follow-up stage, and the entrepreneurial summary stage.

The first is the preparatory stage for entrepreneurship. Entrepreneurs who are in the preparatory period for entrepreneurship should choose an appropriate entrepreneurial direction, find partners and venues, and understand entrepreneurial policies and related business procedures. For the preparatory stage, the focus of entrepreneurial services should be on the transmission and connection of relevant information. Using big data technology to integrate entrepreneurship policy information, entrepreneurial incubation site information, entrepreneurial park support policies, business agencies, and other information, and through the entrepreneurial service platform and other entrepreneurial service entities, the information is transmitted to the entrepreneurial entities during the preparation period to help them manage. We follow the entrepreneurial ideas and clarify the process of starting a business.

The second is the follow-up stage of entrepreneurship. Entrepreneurial entities go through the stage of preparation for entrepreneurship and establish an entrepreneurial enterprise. The initial stage of entrepreneurship is the most difficult stage for most entrepreneurial entities. Entrepreneurial

services at this stage should precisely match the needs of entrepreneurial entities and solve the practical problems of entrepreneurial enterprises. Based on big data technology, through cloud computing and other methods, the behavior of entrepreneurial entities should be deeply analyzed, and the services required by entrepreneurial enterprises should be pushed and matched. The construction of the service system should include multilevel, multicontent, and multiform entrepreneurial services, mainly based on online matching and accurate analysis, supplemented by offline actual docking, and should cover financing investment, technological innovation, information transmission, and market analysis in content, management consulting, human resources, financial and taxation services, and other more comprehensive categories. Based on the important advantages of big data in data analysis and resource planning, we fully integrate service agencies and service resources, establish an entrepreneurial service resource database, and obtain entrepreneurial enterprise information and data through data collection, data capture, and data mining. Enterprise database was used to track enterprise growth data.

The third is the stage of entrepreneurship summary. For start-up companies that have successfully entered the IPO stage, or have entered the medium and large scale, they can be positioned as having left the start-up stage and entered a relatively stable development period. Enterprises at this stage are no longer the main service groups for entrepreneurial services. For this part of the main body of enterprise entrepreneurship services, mainly through the data collection and data analysis of big data, the development stage of the enterprise is judged, and based on the long-term tracking data, the entrepreneurial development path is summarized and used to improve the construction of the entrepreneurial environment. For some enterprises that have gone bankrupt, liquidated, or ceased operations, the entrepreneurial service entity should update the enterprise information in the database and analyze the reasons for the enterprise's withdrawal from the market. According to the results of statistical analysis of data, we improve and adjust the built entrepreneurial environment to improve the success rate of enterprise entrepreneurship.

5. Conclusion

In recent years, under the strong support and guidance of national policies, "mass entrepreneurship and innovation is continuing to advance to a larger scale, a higher level and a deeper level." Big data has become a new driving force for national innovation and entrepreneurship. Although colleges and universities, which are responsible for cultivating high-quality talents for innovation and entrepreneurship, have achieved certain results, there are still many problems in practice, especially in the construction of college students' entrepreneurial environment. There is a need for innovation driven by big data. The construction of big data and the entrepreneurial environment of college students has certain inherent commonality. The integration of big data into the entrepreneurial environment of college students needs to be improved and strengthened in terms of top-level design,

data environment, and educational concepts. The integration of big data, cloud computing, and other information technologies and entrepreneurial services provides a foundation and guarantee for building an entrepreneurial environment with reasonable layout, complete structure, and diverse modes.

Data Availability

The figures and tables used to support the findings of this study are included in the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

The authors would like to show sincere thanks to those techniques who have contributed to this research. This work was supported by the 2021 Philosophy and Social Science Research Special project of Jiangsu Provincial Department of Education “Research on the Promotion mechanism of Entrepreneurship Education on the Improvement of College Students’ entrepreneurship ability under the Background of the New Era” (No. 2021SJB0421).

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