Research Article

Quantitative Evaluation and Path Optimization of College Students' Employment Policy Based on Text Mining

Yu Liu[1] **and Ao Li** [2]

[1]*School of Business, Yangzhou Polytechnic Institute, Jiangsu 225127, China*
[2]*School of Management, Fudan University, Shanghai 200043, China*

Correspondence should be addressed to Ao Li; 21260690243@m.fudan.edu.cn

Based on the text mining method, the high-frequency word extraction of 20 policies to promote the employment of college students from 2015 to 2020 was carried out, and the key areas of concern of the policy texts were obtained, and the relationship between the policy priorities was visually displayed in the form of visual Knowledge Graph. On this basis, a PMC index model composed of 9 first-level indicators and 31 second-level indicators is constructed to quantitatively evaluate the employment policy of college students and select a representative policy P3 to draw the PMC surface map to trace the advantages and disadvantages of the secondary indicators of the policy and explore the path of policy optimization. The results show that the evaluation results of 19 of the 20 policies are acceptable or excellent, accounting for 95%, indicating that most of the current policies can effectively promote the employment of college students. However, representative policies can be optimized and upgraded according to two different ideas: "policy tendency-policy field-target-policy focus" and "policy tendency-policy field-policy effectiveness-policy focus-target-policy nature."

1. Introduction

Since the implementation of the university enrollment expansion policy in 1999, the number of newly graduated college students in my country has increased rapidly every year, and their employment problems have become increasingly prominent. In 2019, for the first time, the country puts the employment priority policy at the top of macro policies, strengthening the policy orientation of attaching importance to and supporting employment [1]. College students are one of the groups greatly affected by employment policies. Its policies involve the balance of different subjects such as workers, employers, universities, and the government, as well as the balance between short-term response to employment, medium-term advocacy of active employment, and long-term realization of stable employment. With the normalization of epidemic prevention and control and the influence of uncertain factors at home and abroad, the transmission mechanism of employment pressure is more complex and diverse. In order to promote the implementation of the task of "ensuring employment," the timeliness of employment policy timeliness, simplicity of operation, and overall vision are very important [2]. In this context, from the perspective of policy quantitative evaluation, it is necessary to select employment policy evaluation indicators suitable for the employment characteristics of college students and establish a complete evaluation system for college students' employment policies, so as to evaluate college students' employment policies and point out the implementation process of policies Optimization path.

2. Literature Review

In recent years, as the higher education in various countries and regions in the world has changed from popularization to popularization, the number of college students is increasing day by day, and the employment policy of college students has become one of the core issues in Chinese and Western research. Grotkowska [3] and others believe that the employment problem of college students is essentially a matching problem between the supply of talents in higher education and the demand for social occupations.

2.1. The Current Situation of Employment Policy Evaluation of Foreign College Students. From a practical point of view, foreign governments have established different institutional systems to promote the employment of college students through bills and systems. Paterson pointed out that Britain was the first to start the reform in the field of employment. The employment goal was adjusted from "full employment" in the first generation of welfare state to "promoting employment" to provide education and training for young people mainly college students [4]. After the 1990s, France introduced the "Youth Employment Act" to help young people find jobs. Germany promotes the employment of college students by subsidizing enterprises. In addition, Japan has implemented the "Dream Realization" project to build an interactive platform for college students and small- and medium-sized enterprises. The United States promotes employment through improving college students' employability in the form of "apprenticeship program." These measures have indeed promoted the employment of college students to a certain extent, but due to the multiple impacts of the internal and external environment on the operation of the project, the actual effect still needs further quantitative assessment. Affected by the instability of the global economic environment, European countries still have many practical obstacles in the employment process of youth groups represented by college students, which need to be adjusted and improved in terms of institutional systems and policies. For this reason, the EU calls on member states to provide such key groups with "more targeted training measures and encourage the wide participation of small and medium-sized enterprises that are not willing to provide training opportunities for employees," so as to enable "workers to continuously improve their labor skills in their career to adapt to changes in market demand." The phenomenon of "education is not in employment, education or training" (NEET, not in employment, education, or training) to maintain social stability [5].

From the perspective of academic research, foreign scholars and institutions focus on relatively broad policy analysis for employment policy research. However, because college students are a part of the developed human resources market for western countries, the particularity of the employment problem of this group is not obvious. Scholars have not conducted in-depth research on the employment policy for college students as a more independent proposition. At the theoretical level, it mainly focuses on the perspective of policy tools matching demand. At the content level, it focuses on career guidance and career planning. For example, since 1996, Japan's Ministry of Health, Labor, and Welfare has conducted career evaluation, performance evaluation, and overall evaluation including pre-event, intermediate, and post-event. The evaluation criteria include necessity, efficiency, effectiveness, fairness, and priority. There are also Bidani and others who use propensity score matching model and time series regression model to evaluate the implementation effect of a specific employment policy [6]. Although this kind of evaluation has high accuracy, these methods are limited in practical application due to their precise data requirements, large amount of data, and strict statistical criteria.

2.2. Current Situation of Employment Policy Evaluation for Domestic College Students. Domestic research on the evaluation of college students' employment policies mainly focuses on two aspects. On the one hand, it conducts macro-evaluation research from policy implementation participants. Some scholars have studied the employment support policies for college students from the perspective of supply and demand, and believe that the implementation efficiency of public policies depends to a large extent on the subjective initiative of the policy objects and their own qualities [7]. Some scholars also proposed to build a reasonable operation mechanism of college students' employment policy, to enhance the coordination of policy makers, and to form a reasonable operation mechanism of college students' employment policy [8].

On the other hand, the research evaluates the employment policy of college students by obtaining data. For example, DEA is used to analyze the effectiveness of policies [9]; fuzzy comprehensive evaluation models [10] and structural equations are established [11]. Due to the wide coverage and huge system of policies to promote the employment of college students, it is necessary to fully mobilize the cooperation of multiple departments. Therefore, choosing an appropriate evaluation method is the key to ensuring the reasonable and accurate results of policy evaluation.

2.3. Policy Evaluation Method Based on PMC Index Model. In academic research, they are not only normative research methods that focus on value judgment but also empirical research methods that focus on mathematical analysis [12]. In practical application, due to the wide coverage of policies to promote the employment of college students, Text Mining, as one of the methods of natural language data processing, can scientifically analyze and guide the development trend of future policies, so it has risen since the 1990s, rapidly becoming one of the cutting-edge methods in data mining technology. At present, one of the more advanced evaluation methods for policy texts in the world is the PMC index evaluation model proposed by Estrada [13], which considers the connection of relevant variables as much as possible, follows the principle of internal consistency of policies, and conducts quantitative evaluation research on published policies. It has the advantages of index traceability and grade identifiability. Many scholars have applied this method in different research fields to expand research [14–16]. On the one hand, the PMC index model can effectively avoid policy quantification by balancing variables on the premise that variables obey binary distribution. On the other hand, PMC index rating and PMC surface drawing can directly reflect the advantages and disadvantages of a policy and the specific situation of individual items, and propose targeted improvement paths for policy optimization.

3. Construction of PMC Index Model Based on Text Mining

3.1. Construction of PMC Model for College Students' Employment Policy. When the PMC index model method is used to evaluate the employment policies of college students, there are four basic steps: first, select the policies to

TABLE 1: List of 20 representative policies to promote the employment of college students.

Number	Text name	Post font	Issuing authority	Release date
P1	Opinions of the State Council on Further Doing a Good Job in Employment and Entrepreneurship under the New Situation	Guo Fa [2015] No. 23	State Department	May 1, 2015
P2	Implementation Opinions of the General Office of the State Council on Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities	Guo Ban Fa [2015] No. 36	General Office of the State Council	May 13, 2015
P3	Opinions of the State Council on Several Policies and Measures for Vigorously Promoting Mass Entrepreneurship and Innovation	Kwok Fat [2015] No. 32	State Department	June 16, 2015
P4	Circular of the General Office of the State Council on Printing and Issuing the Plan for Further Improving the Division of Key Tasks in Employment and Entrepreneurship Work under the New Situation	State Office Letter [2015] No.47	General Office of the State Council	June 26, 2015
P5	Circular of the State Council on Printing and Distributing the National Science and Technology Innovation Plan for the 13th Five-Year Plan	Kwok Fat [2016] No. 43	State Department	August 08, 2016
P6	Implementation Opinions of the State Council on Stimulating the Vitality of Key Groups and Increasing the Income of Urban and Rural Residents	Kwok Fat [2016] No. 56	State Department	October 21, 2016
P7	State Council on Printing and Issuing the Development of National Education Notice of the "13th Five-Year Plan"	Kwok Fat [2017] No. 4	State Department	January 10, 2017
P8	Opinions on Further Guiding and Encouraging College Graduates to Work at the Grassroots Level	Zhongban Fa [2016] No.79	General Office of the CPC Central Committee and General Office of the State Council	January 24, 2017
P9	Circular of the State Council on Printing and Distributing the "13th Five-Year Plan" to Promote Employment	Kwok Fat [2017] No. 10	State Department	February 06, 2017
P10	Medium and Long Term Youth Development Plan (2016-2025)		State Department	April 13, 2017
P11	The State Council on doing a good job in the current and future period Opinions on employment and entrepreneurship	Kwok Fat [2017] No. 28	State Department	April 19, 2017
P12	Notice of the General Office of the Ministry of Education and the General Office of the State-owned Assets Supervision and Administration Commission of the State Council on Holding Online Recruitment Activities for Fresh College Graduates in Strategic Emerging Industries	Teaching Hall Letter [2018] No. 28		June 19, 2018

Table 1: Continued.

Number	Text name	Post font	Issuing authority	Release date
P13	The State Council on doing a good job in the current and future period Some opinions on promoting employment	Guo Fa [2018] No. 39	State Department	December 05, 2018
P14	The General Office of the State Council on printing and distributing class skills promotion actions Notice of the program (2019-2021)	Guoban Fa [2019] No. 24	General Office of the State Council	May 24, 2019
P15	Opinions of the State Council on Further Doing a Good Job in Stabilizing Employment	Kwok Fat [2019] No. 28	State Department	December 24, 2019
P16	Notice of the Ministry of Education on Coping with the COVID-19 epidemic and doing a good job in the employment and entrepreneurship of graduates of ordinary colleges and universities in 2020	Ministry of Education	Teaching [2020] No. 2	March 04, 2020
P17	Circular of the General Office of the Organization Department of the CPC Central Committee and the General Office of the Ministry of Human Resources and Social Security on Dealing with the Impact of the COVID-19 epidemic and Doing a Good Job in Public Recruitment of College Graduates by Institutions	No. 27 [2020], Renshe Hall	General Office of the Organization Department of the CPC Central Committee, General Office of the Ministry of Human Resources and Social Security	March 11, 2020
P18	The General Office of the State Council on coping with the impact of the COVID-19 epidemic Implementation opinions on strengthening employment stabilization measures	Guo Ban Fa [2020] No. 6	General Office of the State Council	March 20, 2020
P19	Notice of the General Office of the Ministry of Industry and Information Technology and the General Office of the Ministry of Education on Launching the 2020 National 100-day Online Recruitment of College Graduates for Small and Medium-sized Enterprises	No. 88 [2020] of the Joint Enterprise Letter of the Department of Industry and Information Technology	General Office of the Ministry of Industry and Information Technology, General Office of the Ministry of Education	April 27, 2020
P20	Notice of the General Office of the Ministry of Human Resources and Social Security and the General Office of the Ministry of Finance on Doing a Good Job in the Implementation of the "Three Supports and One Help" Plan for College Graduates in 2020	No. 57 [2020], Renshe Hall	General Office of the Ministry of Human Resources and Social Security General Office of the Ministry of Finance	May 19, 2020

Source: The official website of the Central People's Government, the Ministry of Human Resources and Social Security, and the Ministry of Education, compiled by the author.

be evaluated and classify the indicators based on the results of text mining and reference to the research results of experts and scholars; then according to formula (1), determine the value of the secondary variable $Im : n$, and the secondary variables are all subject to the [0,1] distribution; then calculate the value of each primary variable according to formula (2); finally bring each primary variable into formula (3), calculate the PMC index of different policies, and proceed according to the standard rating and surface plotting.

$$I_{m:n} \sim N[0, 1], \tag{1}$$

Table 2: Statistics on the types of 20 representative policies to promote the employment of college students.

Post type	Quantity	Percentage
Notice	10	50%
Opinion	9	45%
Planning	1	5%

where m = primary variable; n = secondary variable, m, n = 1,2,3,4,5,6,7,8,9,… ∞.

$$I_m = \left(\sum_{j=1}^{k} \frac{I_{i:j}}{k} \right),$$ (2)

$$I_i \sim R\,[0, 1],$$

where k represents the number of secondary variables, k = 1,2,3,4,5,6,7,8,9,… ∞.

$$PMC = I_1 \left(\sum_{a=1}^{k} \frac{I_{1:a}}{k} \right) + I_2 \left(\sum_{b=1}^{k} \frac{I_{2:b}}{k} \right) + I_3 \left(\sum_{c=1}^{k} \frac{I_{3:c}}{k} \right) + \cdots I_m \left(\sum_{z=1}^{k} \frac{I_{m:z}}{k} \right).$$ (3)

The time for obtaining the policy text of this article is set from January 1, 2015, to July 16, 2020. In 2015, the State Council issued document No.23, "Opinions of the State Council on Further Doing a Good Job in Employment and Entrepreneurship under the New Situation," which was a milestone policy document in the employment policy at that time and in the following period and played an outlining role. On July 16, 2020, considering that the uncertain changes in the external environment in 2020 have brought greater impact on the employment of college students, the economic operation data for the first half of the year were released on that day. Research on the policies for this period of time can provide important reference for the continuation of policies under the normalization of epidemic prevention and control.

On the basis of setting the acquisition time of policy text, in order to evaluate the policy more objectively and comprehensively, this paper uses Python-based text mining technology to obtain text and automatically captures the information of the World Wide Web according to preset rules by running code. This article uses "graduates," "college students," "college graduates," and "employment" as key words to capture information, and obtains 20 policy texts that are closely related to college students' employment from the official website of the Central People's Government, the Ministry of Human Resources and Social Security and the Ministry of Education, as shown in Table 1:

Further analysis also shows that, as shown in Table 2, among the 20 representative policies, notification accounts for 50%, opinions account for 45%, and planning accounts for 5%. This shows that although the policy on the employment of college students has received some attention, it still needs to be further improved in terms of compulsion and authority.

3.2. Policy Text Preprocessing, High-Frequency Word Extraction, and Visual Knowledge Graph Presentation.

Because college students belong to a part of the job market, the employment methods and employment policies of such groups have certain particularities, and the preliminary obtained policy text still contains content that promotes other employment groups. In order to ensure the accuracy and pertinence of the analysis of the policy text, first, use Python technology to write a function setting keyword based on the stopwords = stpowordslist () command to screen out the content directly related to college students' employment in the text, and conduct targeted research on matching segments to import preprocessed text files. Then, execute word_list commands, new_text commands to traverse the text file, connect, calculate word frequency, set word style, and finally generate high-frequency word sorting and visual Knowledge Graph, as shown in Table 3 and Figure 1. Among them, the obtained high-frequency words reflect the focus of policy attention, and the size and relationship of the obtained Knowledge Graph nodes reflect the relationship between each node, which can directly reflect the interconnection of high-frequency words in the research field.

The words with frequency exceeding 150 are shown in Figure 1.

As can be seen from Figure 1, in the policy text to promote the employment of college students, the most frequent high-frequency word is "education," which shows that improving the employment ability of college students through school education is of great significance to promoting the employment of such groups and is the key content of the policy text over the years. According to the analysis of other high-frequency words, it can be seen that (1) from the perspective of the subjects involved, "universities, society, enterprises, the state, the grassroots and the countryside" appear in turn, which shows that the employment of college students is a systematic project of multiparty linkage and the enthusiasm of all parties should be fully mobilized. Grass-roots employment and the construction of a new countryside are also one of the important ways for college students to realize employment advocated by the government in recent years. (2) From the perspective of the implementation of the policy, the high-frequency words that appear are "entrepreneurship, development, establishment, service, innovation, training", etc. This shows that due to the relative weakness of such groups when entering the job market for the first time and their greater dependence on the employment environment and policies, they need to be guided and encouraged in multiple dimensions by active employment policies. (3) From the point of view of paying attention to the content, the high-frequency words appearing in turn include "talents, teaching, technology, ability, curriculum, practice", etc. It is re-emphasized that college students, as a part of talents, need to improve their employability, alleviate structural employment problems, and realize fuller and higher quality employment from various ways such as university curriculum reform, improvement of their own technical ability, and accumulation of practical experience to realize employment.

TABLE 3: The top 50 high-frequency words of college student employment policy.

Vocabulary	Frequency	Vocabulary	Frequency	Vocabulary	Frequency	Vocabulary	Frequency	Vocabulary	Frequency
Education	740	University	508	Entrepreneurship	404	Development	301	Build	295
Service	294	Innovation	273	Talent	218	Cultivate	195	Teacher	187
Grassroots level	177	Mechanism	167	Society	167	Policy	164	Training	161
Encourage	142	Enterprise	140	Resources	140	Management	139	Teaching	139
Reform	135	System	131	System	129	Country	128	Promotion	105
Sound	104	Guarantee	101	Guide	99	Promotion	99	Quality	97
Project	93	Technology	92	Ability	92	Improve	90	Recruitment	85
Speed up	84	Active	82	Strengthen	82	Poverty	77	Learning	73
Cooperation	73	Courses	72	Skills	71	Increase	69	Expand	69
Coordination	68	Rural	62	Practice	54	Platform	53	Subsidies	53

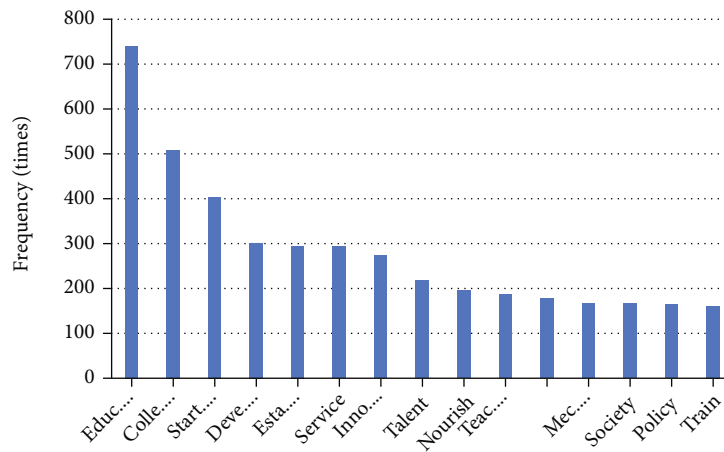Source: Python-based text mining processing results.

FIGURE 1: High-frequency words in the text of college student employment policy (more than 150 times).

3.3. Constructing PMC Index Model of College Students' Employment Policy.

On the basis of summarizing the results of high-frequency words and visual graph analysis of policy texts, this paper draws on the design concepts of many experts and scholars to form a PMC evaluation index system for college students' employment policies. The specific steps are as follows: First, according to the design concepts of previous scholars, combined with the research objects of this article, the first-level indicators are selected as 9, namely: policy nature I1, policy timeliness I2, policy field I3, policy tendency I4, policy focus I5, policy perspective I6, regulatory scope I7, issuing agency I8, and target I9, and three secondary indicators of policy nature I1 and four secondary indicators of policy timeliness I2 are designed. Second, according to scholars' classification of policy tools, combined with the characteristics of college students' employment, four secondary indicators under policy field I3 are designed. Third, according to the policy focus areas reflected by the high-frequency words presented in the visual map, the four secondary indicators under the policy trend I4, the six secondary indicators under the policy focus i5 and the goal i9. The six secondary indicators are defined. Fourth, referring to the design concepts of scholars' policy evaluation on policy perspective, regulatory scope, and publishing agency, the two

secondary indicators under policy perspective I6, the two secondary indicators under regulatory scope I7, and the three secondary indicators under publishing agency I8 were adjusted. Finally, an evaluation system of PMC indicators for college students' employment policy consisting of 9 first-class indicators and 31 second-class indicators was formed, as shown in Table 4.

Policy nature I1 is used to judge whether the policy has a predictive, regulatory, and guiding effect on the employment of college students. Policy prescription I2 is divided into four stages: this year, short term, medium term, and long term according to the length of time involved in the policy content. Policy area I3 is divided into four dimensions: demand-driven, supply-promoting, environmental optimization, and supply-demand matching according to the classic concepts of policy tools and the root causes of structural unemployment problems faced by college students. Policy tendency I4 focuses on the way of policy, specifically divided into four tendencies: overall coordination, encouragement and encouragement, reform and innovation, and improvement of the system. Policy focus I5 combines the actual situation of the promotion of college student employment policy and text mining high-frequency words and Knowledge Graph, and is divided into curriculum

TABLE 4: PMC index system and evaluation criteria of college students' employment policy.

Primary indicator	Secondary indicators	Indicator evaluation criteria
I1 nature of policy	I1:1 forecast	Reflect predictability, some are 1, none are 0
	I1:2 regulation	Reflect supervision, some are 1, no is 0
	I1:3 boot	Reflect guidance, some are 1, none are 0
I2 policy effectiveness	I2:1 long term	For content involving more than ten years, some are 1 and none are 0
	I2:2 medium	Involving five to ten years of content, some are 1, not 0
	I2:3 short term	Involving one to five years of content, some are 1, not 0
	I2:4 this year	Involving the content of this year, some are 1 and none are 0
I3 policy area	I3:1 demand pull	Involving content driven by demand-side measures such as expanding the scale of employment and providing jobs, some are 1 and none are 0
	I3:2 supply promotion	Involving content promoted through supply-side measures such as improving employability and strengthening employment training, some are 1 and none are 0
	I3:3 environmental optimization	For content related to optimizing the employment environment for job hunting, there are 1 and no 0
	I3:4 supply and demand matching	Involving content such as providing a supply and demand matching platform and strengthening employment services, some are 1 and none are 0
I4 policy orientation	I4:1 coordination	Contains overall coordination content, 1 if there is one, 0 if there is none
	I4:2 encouragement	Contains encouragement and incentive content, 1 for some, 0 for none
	I4:3 reform and innovation	Including reform and innovation content, some are 1, not 0
	I4:4 perfect system	Contains the content of the perfect mechanism system, some are 1, no is 0
I5 policy focus	I5:1 curriculum reform	The policy attaches importance to curriculum reform, some are 1, not 0
	I5:2 skill improvement	The policy focuses on skills upgrading, some are 1, not 0
	I5:3 entrepreneurship-driven	The policy attaches importance to entrepreneurship to promote employment, some are 1, not 0
	I5:4 protection of rights	The policy attaches importance to the protection of rights and interests, some are 1, not 0
	I5:5 employment at the grassroots level	The policy attaches importance to grass-roots employment, with 1 for some and 0 for none.
	I5:6 rural revitalization	The policy attaches importance to the realization of employment under rural revitalization, with 1 for some and 0 for none.
I6 policy perspective	I6:1 macro	Involving macro policies, some are 1, not 0
	I6:2 microscopic	Involving micro policies, some are 1 and none are 0
I7 regulatory range	I7:1 nationwide	The scope of regulation is nationwide, if it is 1, it is not 0
	I7:2 provincial and municipal scope	The scope of regulation is provinces and cities, if it is 1, it is not 0
I8 publishing agency	I8:1 State Council and General Office	Issued by the State Council and its General Office, if it is 1; otherwise, it is 0
	I8:2 ministries and commissions of the State Council	Issued by ministries and commissions of the State Council, it is 1 if it is; otherwise, it is 0
	I8:3 joint release by multiple departments	Multi-department joint release, is 1, not 0
I9 object	I9:1 government entities	Policies affect government entities, 1 if yes, 0 if no
	I9:2 grassroots rural	The effect of the policy on the grass-roots rural areas is 1, not 0
	I9:3 industry	If the policy acts on a certain type of industry, it is 1, but not 0
	I9:4 enterprise	If the policy acts on a certain type of enterprise, it is 1, but not 0
	I9:5 school	The policy acts on the school, if it is 1, it is not 0
	I9:6 college students	The effect of the policy on the college student group is 1, not 0

Table 5: PMC index model multiple input-output table.

I1	I2	I3
I1:1 I1:2 I1:3	I2:1 I2:2 I2:3 I2:4	I3:1 I3:2 I3:3 I3:4
I4	I5	I6
I4:1 I4:2 I4:3 I4:4	I5:1 I5:2 I5:3 I5:4 I5:5 I5:6	I6:1 I6:2
I7	I8	I9
I7:1 I7:2	I8:1 I8:2 I8:3	I9:1 I9:2 I9:3 I9:4 I9:5 I9:6

Table 6: PMC index rating standard.

PMC score	Policy evaluation
[0, 3.99]	Bad grade
[4,5.99]	Acceptable level
[6, 7.99]	Excellent
[8,9.99]	Perfect level

Data source: collated according to the evaluation criteria in the Estrada paper.

reform, skill upgrading, entrepreneurship promotion, rights protection, grassroots employment, and rural revitalization. Policy perspective I6 points are divided into macro and micro perspectives according to the policy perspective. The scope of regulation I7 focuses on the national and provincial and municipal levels. Issuing agency I8 is divided into three levels by the State Council and its general office, ministries, and commissions of the State Council and multiple departments. Target I9 refers to which receptors the policy content plays a role, including government entities (institutions), grassroots rural areas, different industries, different types of enterprises, schools undertaking education, and college students themselves.

On the basis of Table 4, the PMC finger model multi-input-output table can be further established, as shown in Table 5.

According to formula (1)–(2), the specific scores of the secondary indicators of each of the 20 policies can be calculated. On this basis, the respective PMC indexes of the 20 policies can be calculated according to formula (3), and then the PMC scores of the optimal policies of each indicator (that is, the virtual "perfect" policy to be introduced later) are subtracted to obtain the depression index. Since the primary indicators selected in this article are 9 items, combined with the rating criteria in Table 6, the PMC index ranking and rating of 20 college students' employment policies are obtained, as shown in Table 7.

Based on the evaluation results in Table 7, the 20 policy levels to be evaluated are classified as shown in Figure 2, and the time series scores are shown in Figure 3:

According to Figures 2 and 3, 10 excellent policies can be seen, accounting for 50%; there are 9 acceptable policies, accounting for 45%. There is only one bad-grade policy, which fully shows that the vast majority of policies to promote the employment of college students introduced since 2015 can effectively promote the employment of such groups, and the promotion effect of excellent-grade policies is especially obvious. Judging from the time series, the score fluctuates intermittently with the passage of time on the whole, but the overall trend is good. P10 is the "Medium-and Long-Term Youth Development Plan (2016-2025)" promulgated by the State Council in 2017, with the highest score, indicating that the employment problem of college students is not a problem of realizing employment at a certain time node, but a system project that requires a long-term vision, runs through the education cause, concerns the long-term development of youth, and is linked by multiple parties. It needs to form a policy framework from "top-level design concept-long-term planning-specific policy measures landing-multi-policy and multi-department joint-feedback supervision and evaluation mechanism improvement." When designing policies, the stronger the overall control, the more comprehensive the target, and the more attention paid to improving employment skills and matching supply and demand, the better the effect, the higher the score. It fully reflects that employment policy is a systematic project. Only by designing a full-process and sustainable employment policy operation mechanism, scientifically studying and judging multiple mechanisms affecting the labor market, efficiently implementing policy combination strategies, and deeply grasping the employment laws of college students can employment be promoted more effectively. This also provides a reference for further optimization of policies at the acceptable level.

Among the policies whose evaluation results are acceptable, the characteristics of employment policy are wide-ranging, multidimensional, and complex. For example, P2 is the "Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities" issued by the General Office of the State Council in 2015, which reflects and attaches importance to the driving role of entrepreneurship in employment. It has sufficient academic support and is in line with mass entrepreneurship and innovation. The goal-oriented policy design with long-term consideration and overall perspective can not only play an important role at that time but also come down in one continuous line with subsequent policy design, and can launch a series of precise employment policies after the outbreak of the epidemic in 2020, such as P11 and P16 promote college students to achieve fuller and higher quality employment, and apply science and technology to promote the employment paradigm of college students from industrial economy paradigm to digital economy paradigm under the background of "Internet +," thus providing policy support and reflecting the guiding and predictive role of policies. Another example is the P20 policy for the 2020 Ministry of Human Resources and Social Security issued

TABLE 7: PMC index and rating of 20 employment policies for college students.

| Policy	I1	I2	I3	I4	I5	I6	I7	I8	I9	PMC	Level	Depression index
P1	0.33	0.75	1.00	1.00	0.71	1.00	0.6	0.33	0.67	6.39	Excellent	2.61
P2	0.33	0.50	0.50	0.75	0.71	1.00	1.00	0.33	0.50	5.62	Acceptable	3.38
P3	0.33	0.25	0.25	0.25	0.28	0.50	0.50	0.33	0.33	3.02	Bad	5.98
P4	0.33	0.25	0.25	0.25	0.57	0.50	1.00	0.67	0.50	4.32	Acceptable	4.68
P5	0.33	0.50	0.50	0.25	0.57	0.50	1.00	0.67	0.83	5.15	Acceptable	3.85
P6	0.33	0.25	0.75	0.25	0.43	1.00	0.50	0.67	0.67	4.85	Acceptable	4.15
P7	0.33	0.50	0.50	0.75	0.57	1.00	1.00	0.67	0.83	6.15	Excellent	2.85
P8	0.67	0.50	0.75	1.00	0.57	1.00	1.00	0.67	1.00	7.16	Excellent	1.84
P9	0.67	0.75	0.75	1.00	1.00	1.00	1.00	0.33	1.00	7.50	Excellent	1.50
P10	0.67	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.67	7.67	Excellent	1.33
P11	0.67	0.50	1.00	0.75	0.86	1.00	1.00	0.67	0.67	7.12	Excellent	1.88
P12	0.33	0.25	0.75	0.50	0.57	1.00	1.00	0.67	0.67	5.74	Acceptable	3.26
P13	0.33	0.50	0.50	0.75	0.43	1.00	1.00	0.67	0.67	5.85	Acceptable	3.15
P14	0.33	0.50	0.50	0.75	0.57	1.00	1.00	0.33	0.67	5.65	Acceptable	3.35
P15	0.67	0.25	0.75	0.75	0.57	1.00	1.00	0.33	0.67	5.99	Acceptable	3.01
P16	0.67	0.50	0.75	0.75	0.86	1.00	1.00	0.33	1.00	6.86	Excellent	2.14
P17	0.33	0.50	0.75	0.75	0.71	1.00	1.00	0.33	1.00	6.37	Excellent	2.63
P18	0.67	0.50	0.75	0.75	0.71	1.00	1.00	0.67	0.83	6.88	Excellent	2.12
P19	0.67	0.25	0.75	0.75	0.71	1.00	1.00	0.67	0.67	6.47	Excellent	2.53
P20	0.67	0.25	0.50	0.50	0.57	1.00	1.00	0.67	0.67	5.83	Acceptable	3.17
Mean	0.48	0.46	0.66	0.68	0.65	0.93	0.93	0.52	0.73	6.03	- -	2.97

Data source: calculated by the author.
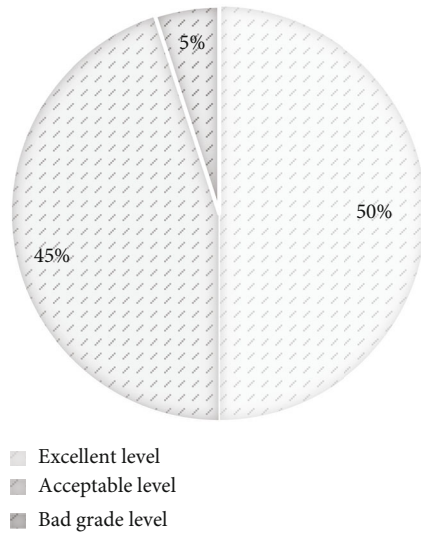
FIGURE 2: 20 representative policy levels classification chart.

the "Notice on the Implementation of the Three Supports and One Help" Plan for the employment of college students after the epidemic. The policy is inherited from the P8 "Opinions on Further Guiding and Encouraging College Graduates to Work at the Grassroots Level" promulgated in 2017, which reflects the overall coordination and policy coherence from the General Office of the State Council to the Ministry of Human Resources and Social Security. College students' employment is highly depen-

dent on the policy, and the scope and focus of the policy are clear and clear, which is beneficial to college students themselves. Reasonable employment choices are also conducive to the matching between supply and demand and alleviate the problem of structural unemployment. For the only nonperforming policy, it is necessary to further draw the PMC surface and compare the advantages and disadvantages, which can not only analyze the policy itself but also provide a scientific basis for policy optimization and promotion.

4. Exploration of Two Policy Optimization Paths Based on PMC Surface

4.1. Select Representative Policies for PMC Surface Rendering. One of the advantages of the PMC index model is that it can draw the PMC surface as a more intuitive expression of the PMC index, display the target policy evaluation scores and pros and cons through a three-dimensional perspective, and determine the policy optimization path by tracing the secondary indicators. The specific method is to convert the score of the first-level variable of the PMC index of the policy to promote the employment of college students into a third-order matrix, as shown in formula (4):

$$PMCsurface = \begin{pmatrix} I_1 \, I_2 \, I_3 \\ I_4 \, I_5 \, I_6 \\ I_7 \, I_8 \, I_9 \end{pmatrix}. \tag{4}$$
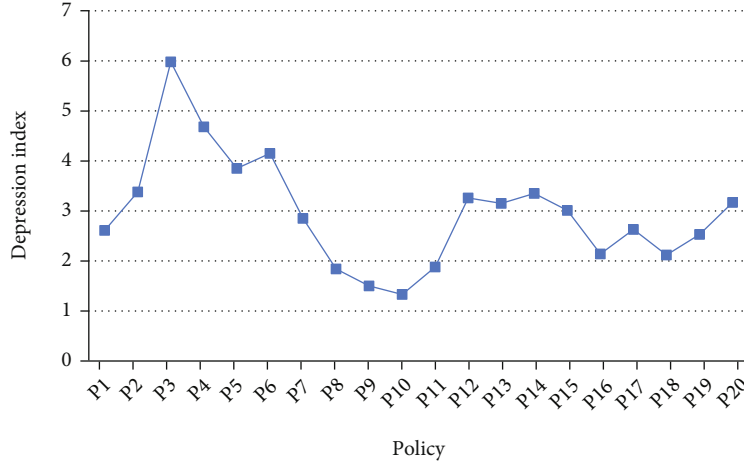
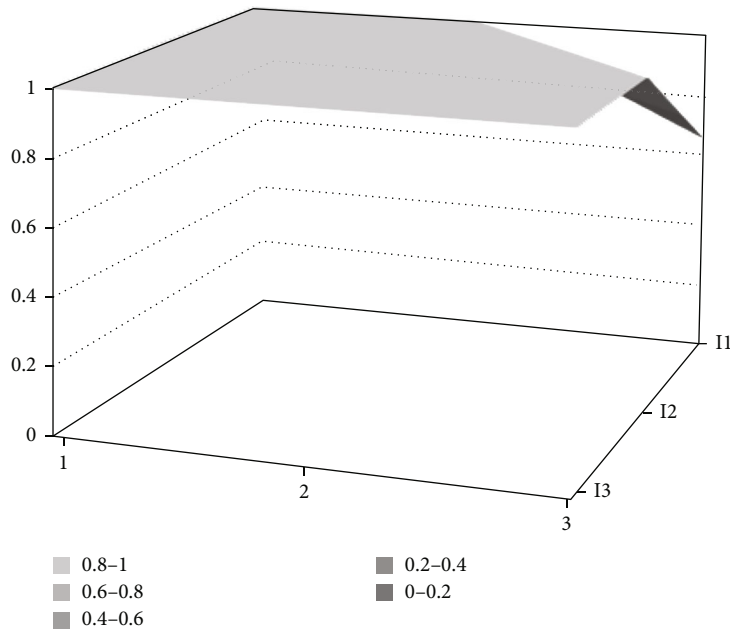Figure 3: 20 representative policies PMC index change chart.

Figure 4: PMC surface diagram for virtual "perfect" policy P21.

In order to make an in-depth analysis of the obtained employment policies for college students, this article explains the policies item by item through formula (4). Considering the comprehensiveness of the analysis of the policy optimization path, this paper introduces a virtual "perfect" policy P21, which has a score of 1, as shown in Figure 3; in addition, this paper selects P3 with the lowest score for detailed analysis and constructs data according to P21 and P3, respectively, as shown in (5) and (6), and then PMC surface diagrams as shown in Figures 3 and 4.

$$P_{21} = \begin{pmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix}, \tag{5}$$

$$P_3 = \begin{pmatrix} 0.33 & 0.25 & 0.25 \\ 0.25 & 0.28 & 0.50 \\ 0.50 & 0.33 & 0.33 \end{pmatrix}. \tag{6}$$

Figure 4 is a virtual "perfect" policy, so its figure is a plane parallel to the bottom surface; the depth of the color block in Figure 5 represents different index scores, and the convex part indicates that the policy has a higher score on the corresponding index and vice versa. Therefore, at the quantitative evaluation level, the depression index obtained by comparing with the index of each level of the virtual "perfect" policy represents the difference between the policy to be evaluated and the virtual "perfect" policy.
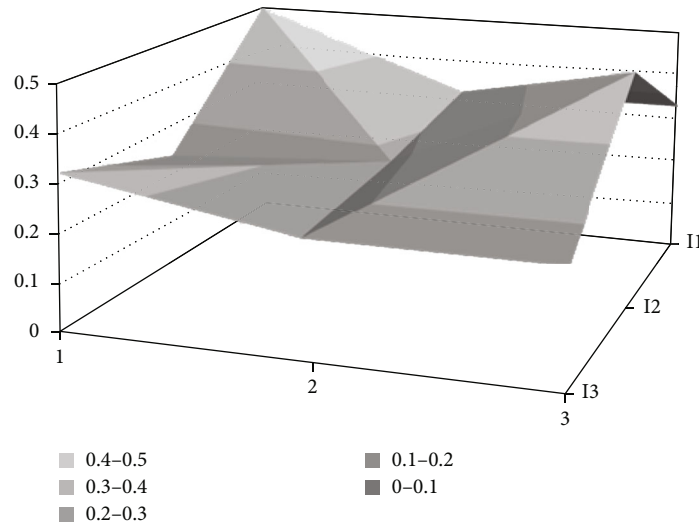
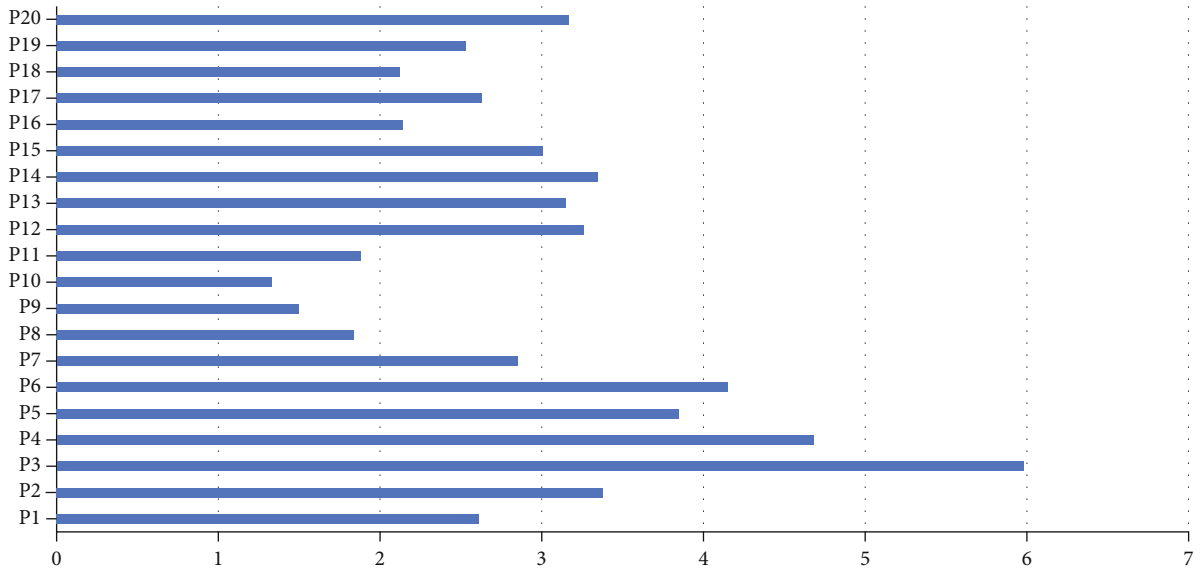Figure 5: PMC surface diagram for representative policy P3.

Figure 6: 20 representative policy depression indices.

4.2. Two Optimization Ideas of Representative Sample Policy.

Table 7 provides further information on the ranking of the depression indices for different policies, as shown in Figure 6:

The depression index of representative policy P3 is 5.98, which was the highest among all policies; the PMC index is 3.02, the lowest of all policies. To optimize and perfect the policy of promoting the employment of college students, the idea can be carried out from two aspects: the first idea is to compare the difference between the index of each level of the policy and the average value of all policies; The second idea is to compare the difference between the policy and the virtual "perfect" policy according to the depression index.

According to the foregoing, P3 is the "Opinions on Several Policies and Measures to Vigorously Promote Mass Entrepreneurship and Innovation" issued by the General Office of the State Council on June 16, 2015, in which the

term "mass entrepreneurship and innovation" was formally put forward at the Summer Davos Forum in September 2014, and the government work report was clearly put forward for the first time in 2015. From academic research to social practice to official documents, it is shown that giving full play to the awareness of entrepreneurship and innovation and promoting employment through entrepreneurship is not only an important way to solve the employment problem but also an important way to stimulate economic vitality and promote sustainable social development.

From the first point of view, P3 in the policy area I3, policy tendency I4, policy focus I5, and the role of the object I9 scores are significantly lower than the average level, and the maximum difference is as high as 0.43, although other indicators are also lower than the average, but because the difference is small or there are only two secondary indicators under the corresponding primary indicators, we will not
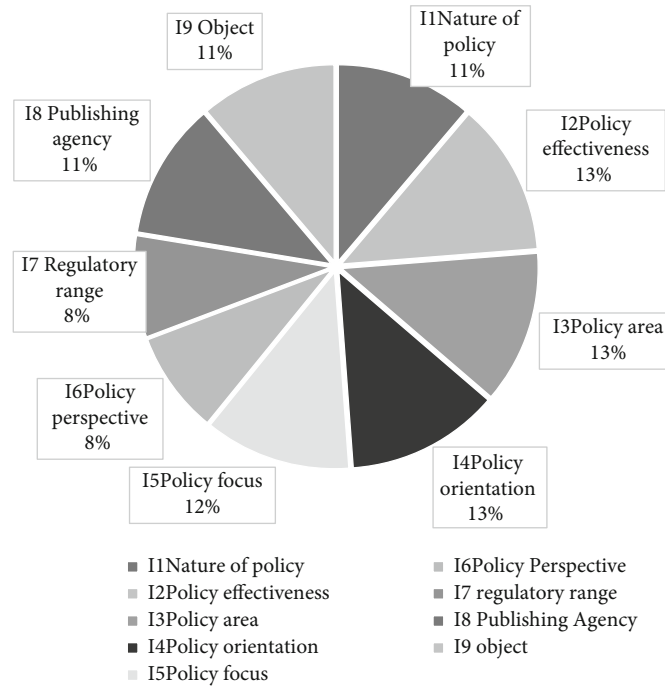
FIGURE 7: PMC surface diagram for representative policy P3.

discuss in detail. However, the employment problem of college students not only has the problem of total employment but also the problem of mismatch between supply and demand in the employment structure, which has a greater impact. In the policy area I3, the policy emphasizes the optimization of the entrepreneurial environment for college students, but it has not been further deepened from the perspective of promoting supply and matching supply and demand; the policy tendency I4 encourages college students to innovate through tax incentives, but it needs to be further improved in overall coordination and mechanism system construction; although the policy focus I5 pays attention to the driving effect of entrepreneurship on employment and also emphasizes the protection of college students' employment rights and interests, but the supporting work related to college students' entrepreneurship, such as university curriculum reform and skill upgrading, has not yet been clearly matched with the landing policy; the target I9 A certain degree of regulation has been carried out from the perspective of the government and enterprises, but the linkage between different industries and various types of enterprises and universities has not been better reflected, and to sum up, the PMC score of the policy is low.

From the second point of view, as shown in Figure 7, the composition of depression index can be analyzed according to the percentage, and the path of policy optimization can be determined according to the proportional order, It can be seen from this that the optimization idea of college students' employment policy is not unique. The choice of specific optimization path should be adjusted according to the policy environment. Moreover, the policy measures corresponding to a certain index will also have a linkage impact on other policies and thus affect the scores of other indexes.

Therefore, in-depth analysis is carried out in combination with the specific situation.

5. Conclusion

Based on the text mining and Knowledge Graph, the PMC index model was constructed. Starting from the milestone policy document issued by the State Council in 2015 that explicitly regards college students as a key focus group to promote employment and entrepreneurship, it obtained and matched the employment of college students. The specific contents of 20 typical policy texts that have an important impact on college students are constructed and rated, and then representative policies P3 are selected from them, and different policy optimization paths are explored according to two ideas. The specific conclusions and recommendations are as follows:

(1) In the process of promoting the employment of college students, the state has always adhered to the orientation of active employment policies. 95% of the policies belong to acceptable or excellent levels, which can promote the employment of college students in all directions. With the passage of time, the policy issuers are also increasing the proportion of excellent policies through more detailed and rigorous optimization measures and have established a three-dimensional employment network system from curriculum reform in colleges and universities, employment guidance to internship opportunities in enterprises, improvement of graduates' employment skills, protection of employment rights and interests, and employment in rural areas at the grassroots level

(2) As China's economy enters a critical period of structural transformation, facing the normalization of epidemic prevention and control and the changes in the employment structure driven by the new technological revolution, the employment policy system should increase its coverage, covering industrial development, finance, taxation, education, and training and other fields, fully mobilize the enthusiasm of the whole society to actively solve the employment problem, especially pay attention to the structural contradictions faced by college students in employment. In the education and training department, based on an in-depth analysis of the supply and demand situation in the current human resources market, timely update the matching education and training content, starting from college education, pay attention to alleviating the structural contradiction of skills, and then promote the overall coordination of different institutions to form an effective policy operation and feedback mechanism. In addition, under the background of epidemic impact, the application of policy tools to consider short-term and sudden cyclical employment difficulties will enhance the synergy between employment policies and other macro-control policies

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

References

[1] S. R. Cellini and N. Turner, "Gainfully employed?," *Journal of Human Resources*, vol. 54, no. 2, pp. 342–370, 2019.

[2] S. C. Riggert, M. Boyle, J. M. Petrosko, D. Ash, and R. C. Parkins, "Student employment and higher education: empiricism and contradiction," *Review of Educational Research*, vol. 76, no. 1, pp. 63–92, 2006.

[3] M. Zafar, "Career guidance in career planning among Secondary school students," *Asian Journal of Education and Social Studies*, vol. 5, no. 1, pp. 1–8, 2019.

[4] A. G. Watts, "Career guidance policy: an international review," *The Career Development Quarterly*, vol. 54, no. 1, pp. 66–76, 2005.

[5] J. Harris Bowlsbey, "Computer-assisted career guidance systems: a part of NCDA history," *The Career Development Quarterly*, vol. 61, no. 2, pp. 181–185, 2013.

[6] S. Minocha, D. Hristov, and M. Reynolds, "From graduate employability to employment: policy and practice in UK higher education," *International Journal of Training and Development*, vol. 21, no. 3, pp. 235–248, 2017.

[7] J. Buchan, "The 'greying' of the United Kingdom nursing workforce: implications for employment policy and practice," *Journal of Advanced Nursing*, vol. 30, no. 4, pp. 818–826, 1999.

[8] D. P. Dolowitz, "British employment policy in the 1980s: learning from the American experience," *Governance*, vol. 10, no. 1, pp. 23–42, 1997.

[9] K. Jacobsson, "Soft regulation and the subtle transformation of states: the case of EU employment policy," *Journal of European Social Policy*, vol. 14, no. 4, pp. 355–370, 2004.

[10] T. Bredgaard and F. Larsen, "Quasi-markets in employment policy: do they deliver on Promises?," *Social Policy and Society*, vol. 7, no. 3, pp. 341–352, 2008.

[11] B. Damgaard and J. Torfing, "Network governance of active employment policy: the Danish experience," *Journal of European Social Policy*, vol. 20, no. 3, pp. 248–262, 2010.

[12] D. Jacoby, "Effects of part-time faculty employment on community college graduation rates," *The Journal of Higher Education*, vol. 77, no. 6, pp. 1081–1103, 2006.

[13] J. Chu, J. Liu, and S. Liu, "Research and countermeasure analysis of college students' employment issues," *Open Journal of Social Sciences*, vol. 8, no. 1, pp. 129–138, 2019.

[14] P. Yang, "The impact of financial aid on learning, career decisions, and employment," *Chinese Education and Society*, vol. 44, no. 1, pp. 27–57, 2011.

[15] K. M. Broton, S. Goldrick Rab, and J. Benson, "Working for college," *Educational Evaluation and Policy Analysis*, vol. 38, no. 3, pp. 477–494, 2016.

[16] P. C. Chen, "Research on dynamic effects of employability of vocational college students in Taiwan," *AIRCC's International Journal of Computer Science and Information Technology*, vol. 6, no. 1, pp. 161–168, 2014.