

Bibliometric Analysis and Visualization of College Students' Entrepreneurial Psychology Research Based on VOSviewer Software

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Abstract

To provide data reference for intuitive and convenient understanding of college students' entrepreneurial psychology research, the relevant literature on the study of college students' entrepreneurial psychology, from 1990 from January 1, 2001, to December 31, 2019, were collected in the critical journals of the CNKI full-text database. This paper uses bibliometrics to analyze the number of papers published, authors and research direction, keywords, research institutions distribution, source journals distribution, cited frequency, funding support. Meanwhile, VOSviewer was used for visualization. A total of 237 papers were included, and the number of literature increased before and decreased after. The keyword frequency of college students, entrepreneurship education, Entrepreneurship, psychological capital, ideological and political education were high. Wenzhou University, Jiangsu University, Nanjing University of Science and Technology, Nantong University, Yancheng Institute of Technology, Changzhou University, Northeast Normal University, Hebei University of economics and trade, Hebei Normal University, Jilin University are the more frequent publishing institutions. The most frequently cited articles were cited 90 times, and the fund support from the province, colleges and universities, and the Ministry of Education was relatively large. In the recent 20 years, the research on college students' entrepreneurial psychology is ups and downs, which is closely related to the development of the social economy. However, the number of papers published in recent years is relatively small, which should arouse enough attention.

Keywords: College students, Entrepreneurship, Psychology, Visual analysis, VOSviewer.

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I. INTRODUCTION

The university graduates' employment problem has always been focused on and highly valued by all fields of society and governments [1]. Simultaneously, the rapid development of artificial intelligence technology dramatically improves work efficiency, reduces labor cost significantly, and works without a time limit, so its advantages are obvious. However, the improvement or replacement of position skills undoubtedly brings unprecedented challenges and impacts contemporary college students' employment [2].

As a new educational concept and mode, college students' innovation and entrepreneurship education has been popularized and promoted in China's Higher Education [3]. Promoting the integration of college students' innovation and entrepreneurship education and ideological and political education can promote college students' development in many aspects, comprehensiveness, and comprehensiveness, which helps to alleviate and enhance the employment environment under the new situation [4]. However, for inexperienced graduates, it is difficult to start their businesses. They are under tremendous psychological pressure. Therefore, a wide range of relevant research on college students' entrepreneurial psychology will help them carry out entrepreneurship. The research on college students' entrepreneurial psychology has become a hot issue. However, in the face of much professional literatures on college students' entrepreneurial psychology, how to accurately grasp the research status and development trend in this field has become the academic circles' focus.

Therefore, the author uses the bibliometric method to retrieve and analyze the literature related to college students' entrepreneurial psychology published from 1990 to 2019 in CNKI, and constructs a visual knowledge map of domestic college students' entrepreneurial psychology research. This paper hopes to sort out the development context and research frontiers of relevant research through data mining to lay a foundation for the continuous research on college students' entrepreneurial psychology and provide data reference for intuitive and convenient cognition of the focus of college students' entrepreneurial psychology research.

II. DATA AND METHODS

2.1 DATA SOURCES

This literature retrieval is to search the CNKI journal full-text database, selecting "advanced searching" mode on November 7, 2020. When searching, the "subject" field is set to search, and the search condition is "college students" with "entrepreneurship" and "psychology". The retrieval date ranges from January 1, 1990, to December 31, 2019. This search is mainly limited to Chinese core journals, CSSCI journals, and CSCD journals.

2.2 INCLUSION AND EXCLUSION CRITERIA

This paper aims to search the journals related to college students' entrepreneurial psychology published in the recent 20 years. A total of 237 literature records were obtained through preliminary manual analysis of literature content, excluding reviews, reports, information, progress, etc.

2.3 DATA PROCESSING

In this study, the bibliometric method introduces the hot spots and development frontiers of college students' entrepreneurial psychology research from the number of published literature, the authors and their research direction, keywords, research institutions, citation frequency, funding, and other aspects. The above indicators reflect the output of researchers' science and technology, the authors' research direction, the hot issues in a specific research field, the distribution of research institutions, the popularity of this kind of research by the journal, the academic influence of academic papers, and the importance attached to the research field by the state and relevant departments.

In this study, VOSviewer software is used to show the author's cooperative relationship and draw a map of scientific knowledge. The document format exported from CNKI was transformed and imported into VOSviewer 1.6.8 software. The "Choose type of data" parameters were set as "Create a map based on bibliographic data". Because there are not many papers retrieved this time, keywords and authors' co-occurrence threshold is set to 1.

III. RESULTS

3.1 NUMBER OF PUBLISHED ARTICLES

The annual statistical results of 237 articles published in Chinese journals are shown in Figure 1. In the past 20 years, the number of research papers on college students' entrepreneurial psychology showed a general upward trend from 2002 to 2013 and began to decline after 2013. Since 2002, the number of published papers has been increasing steadily, with the first peak in 2010, with the annual number reaching 22. The average number of papers published in 2010-2013 was 22.5 and reached the highest value of 26 in 2013. After 2013, the annual publication of this kind of research began to decrease. Although the number of papers published peaked in 2016, there were only two related articles in 2018 and only 8 in 2019. These data reflect the current situation of the research and development of college students' entrepreneurial psychology in China.

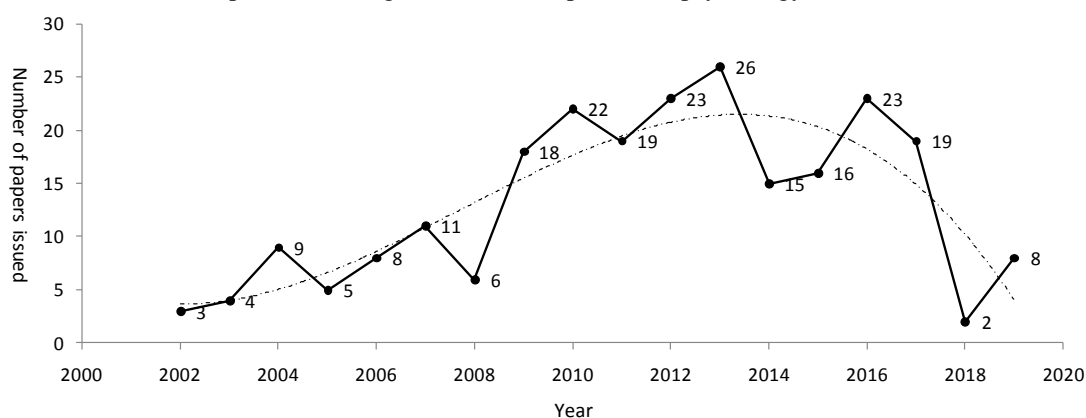


Figure 1: The number of papers published in the research on entrepreneurial psychology of college students from 1990 to 2019

3.2 AUTHOR AND RESEARCH DIRECTION

This paper uses VOSviewer 1.6.8 software to analyze the authors and their research directions in college students' entrepreneurial psychology. The knowledge map of some literature authors (≥ 2 articles) and some authors in the research of college students' entrepreneurial psychology are shown in Table 1 and Figure 2.

Table 1: Part of the authors and papers published on the research of college students' entrepreneurial psychology (≥ 2 articles).

No.	Author	Author's organization	Number of published articles
1	Zhang Su	Central University of Finance and Economics	2
2	Fan Yong	Central University of Finance and Economics	2
3	Fan Wei	Zhejiang University	2
4	Feng Ying	Zhejiang University	2
5	Guo Zhifang	Shangrao Normal University	2
6	Liang Ruimin	Shijia Zhuang University of Applied Technology	2
7	Lin Lei	Shanghai University of Traditional Chinese Medicine	2
8	Liu Yan	Zhenjiang College	2
9	Su Yinan	Jiangsu University	2
10	Tang Lieqiong	Hunan University of Science and Engineering	2

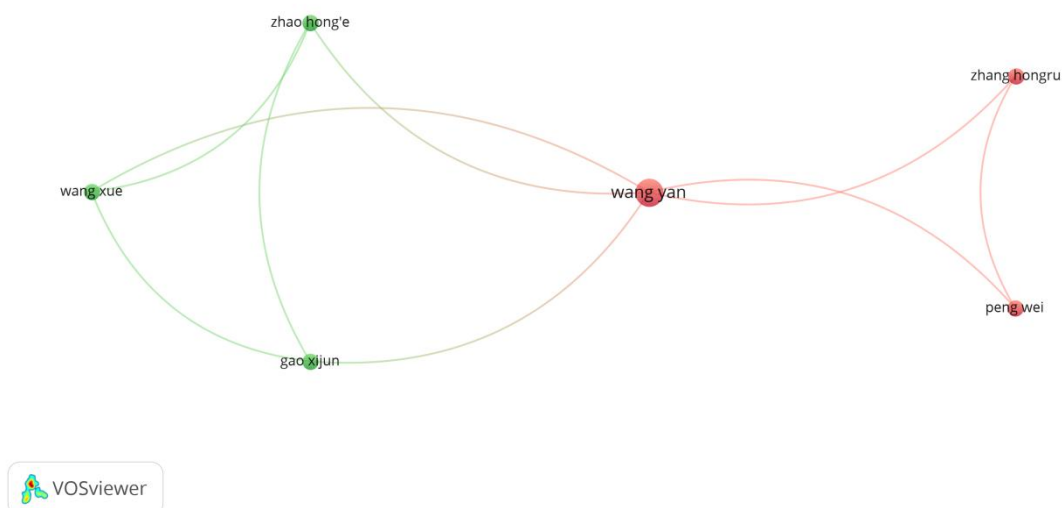


Figure 2: The knowledge map of some authors in the research of college students' entrepreneurial psychology

Different colors represent different clusters. Each node in the cluster represents an author. The node's size represents the number of articles published by the author, and the nodes with the same color represent the relevant information of cooperation between authors. In the author's knowledge map, two different clustering results are generated, which shows that the research team of college students' entrepreneurial psychology in China is not perfect enough (Figure 2).

Wang Yan et al. are the authors with a high volume of papers. Their main concern areas are the influence of psychological capital on college students' entrepreneurial intention and the countermeasures for improving agricultural college students' employment competitiveness [5, 6]. Zhang Su et al. paid attention to the relationship between tax policy and entrepreneurial intention of college students. They measured tax policy's impact on college students' entrepreneurial intention from three perspectives [7]. They also found that financial policy positively impacts college students' entrepreneurial intention, which is because financial policy can improve college students' entrepreneurial self-efficacy and encourage students to cultivate entrepreneurial ability [8]. Zhang Min, from the Department of Psychology, School of Education, Hangzhou Normal University, has paid attention to the influence of individual psychological adjustment orientation and external information characteristics on college students' entrepreneurial risk decision-making process [9]. Tang Lieqiong of Hunan University of Science and Engineering discussed contemporary college students' entrepreneurial personality defects and sound strategies [10].

3.3 KEYWORDS

In this paper, VOSviewer 1.6.8 software is used for keyword visualization and word frequency co-occurrence analysis and statistics. The result of keywords frequency ranking is shown in Figure 3.

Create Map

Verify selected keywords

Selected	Keyword	Occurren...	Total link strength
<input checked="" type="checkbox"/>	college students	88	222
<input checked="" type="checkbox"/>	entrepreneurship education	37	104
<input checked="" type="checkbox"/>	entrepreneurship	18	49
<input checked="" type="checkbox"/>	psychological capital	15	41
<input checked="" type="checkbox"/>	employment	15	39
<input checked="" type="checkbox"/>	entrepreneurial psychological quality	15	39
<input checked="" type="checkbox"/>	college students' entrepreneurship	13	44
<input checked="" type="checkbox"/>	ideological and political education	11	31
<input checked="" type="checkbox"/>	entrepreneurship ability	9	30
<input checked="" type="checkbox"/>	entrepreneurship psychology	8	31
<input checked="" type="checkbox"/>	colleges and universities	8	24
<input checked="" type="checkbox"/>	college graduates	7	25
<input checked="" type="checkbox"/>	higher education	7	21
<input checked="" type="checkbox"/>	employment guidance	7	19
<input checked="" type="checkbox"/>	entrepreneurial intention	7	18
<input checked="" type="checkbox"/>	psychological quality	7	17
<input checked="" type="checkbox"/>	entrepreneurial motivation	6	24

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Figure 3: The results of keywords frequency ranking of college students' entrepreneurial psychology research

VOSviewer 1.6.8 software was used to present keywords knowledge map and keywords density map (Figure 4, Figure 5). It can be seen that the hot keywords in the literature of college students' entrepreneurial psychology mainly include "college students", "entrepreneurship education", "entrepreneurship", "psychological capital", "employment", "entrepreneurial psychological quality", "college students' entrepreneurship", "ideological and political education", "entrepreneurial ability", "entrepreneurial psychology", etc. Combined with the analysis of the above keywords, it can be seen that in the field of college students' entrepreneurial psychology research, entrepreneurship education, employment, psychological capital, entrepreneurial psychological quality, and ideological and political education have always been the focus of research, and they are the areas of general concern of the society, especially colleges and universities.

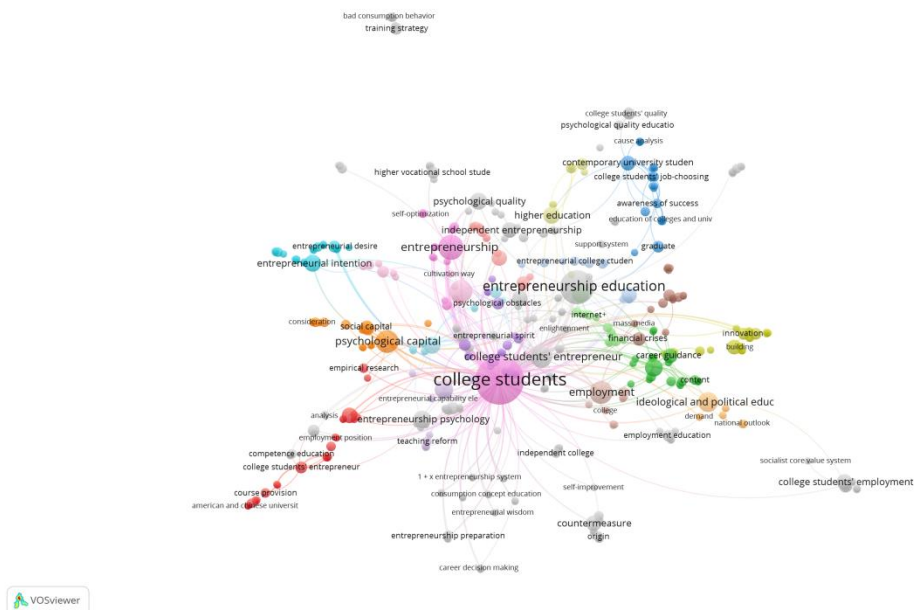


Figure 4: Knowledge map of keywords co-occurrence

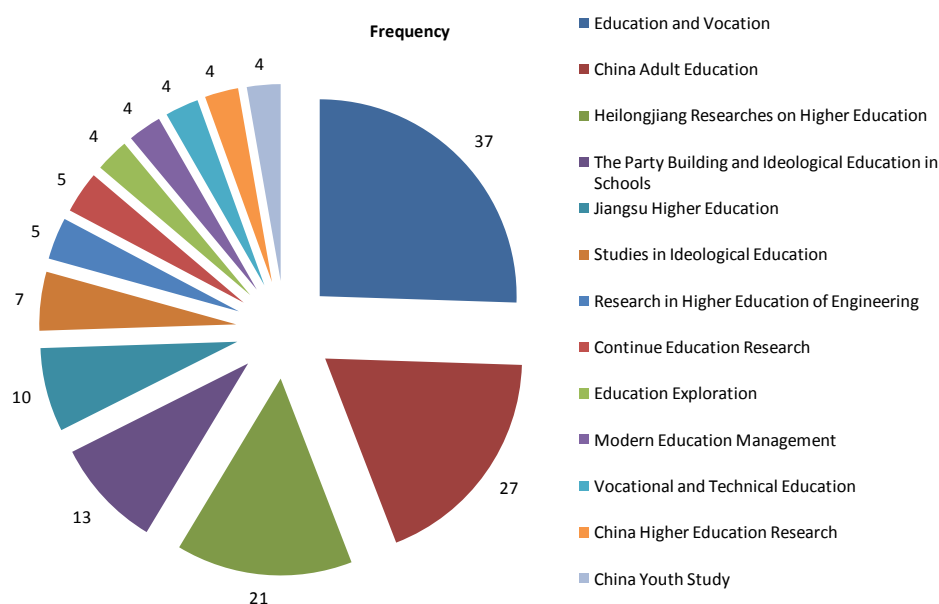


Figure 5: Distribution of journals on college students' entrepreneurial psychology

3.6 CITED FREQUENCY

The top 10 cited articles were cited 664 times. The first cited literature published by Gao Riguang is "The entrepreneurial motivation of Chinese university graduates", cited 90 times [11]. The main research directions of these ten articles are as follows: the research on influencing factors (4 papers), ideological and political education and employment education (4 papers), and psychological quality (2 papers) (Table 3). They are also the focus of many researchers' continuous attention.

Table 3: Top 10 cited literature on entrepreneurial psychology of college students.

Author	Title	Cited frequency
The entrepreneurial motivation of Chinese university graduates [11]	Gao Riguang, Sun Jianmin, Zhou Bei	90
Entrepreneurial Intentions of University Students and Influencing Factors—investigation and analysis based on students from nine universities in Xi'an [12]	Lu Genshu, Peng Zhengxia, Kang Hui	83
Content structure analysis of college students' daily ideological and political education [13]	Luo Yuting, Li Haiyan	81
Analysis of influencing factors on local college students' entrepreneurial tendency [14]	Jiang Haiyan, Yu Ruying	69
Empirical study on the affection of college students' psychological capital on their entrepreneurial intentions [15]	Ke Jianglin, Feng Jingying, Deng Jianguang	61
Research on the current situation and training methods of college students' entrepreneurship consciousness [16]	Liu Fengqing, Qiao Fen	61
Education of employment ideology: new focus and initial point of moral education in university [17]	Zou Haigui, Zhou Yulin	58
On psychological quality education in entrepreneurship education of college students [18]	Chen Canjun	55
A new probe into the survey and education of college students' employment outlook [19]	Xie Anguo	54
Exploration of the cultivation path of college students' entrepreneurial psychological quality [20]	Che Liping, Li Shoucheng	52

3.6 FUND SUPPORT

Based on the analysis of the research literature's funding situation, there are 197 different kinds of projects supporting the research, and the support is still strong. These funds include provincial foundation (98 items, 50%), university and institution foundation (36 items, 18%), National Ministry of Education foundation (32 items, 16%), prefectural and municipal foundation (13 items, 7%), provincial education department foundation (5 items, 3%), other national departments (4 items, 2%), National Social Science Foundation (3 items, 1%) and National Natural Science Foundation (6 items, 3%) (Figure 7). Overall, each province's fund investment is the largest, followed by the universities' fund support.

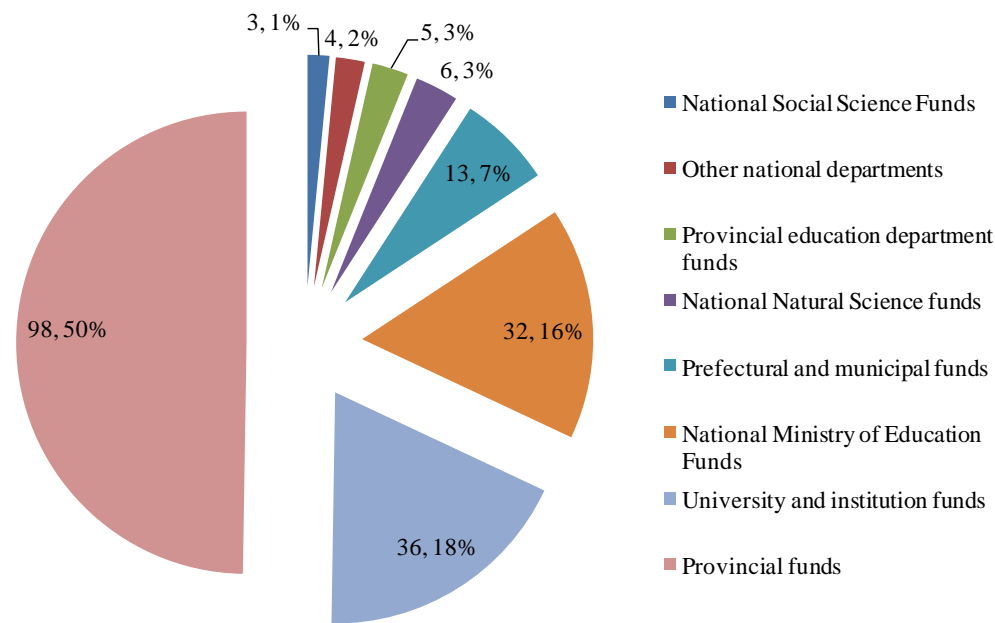


Figure 7: Number and proportion of various funds

IV. CONCLUSION

In order to better grasp the current situation and trend of college students' entrepreneurial psychology research in China, this paper systematically combs the research hotspots in this field by analyzing the relevant literature of college students' entrepreneurial psychology research, and the results show that the research field of college students' entrepreneurial psychology is still in continuous development and exploration. The statistical results of the publication of professional literature in different periods show that the number of literature on college students' entrepreneurial psychology is ups and downs in the recent 20 years. The discipline field has been continuously extended, and the research hotspots have been constantly transferred and transformed with the development of the social economy. From 2010 to 2016, the largest number of relevant research papers were published, which may be related to Chinese society's remarkable development and changes in this stage.

Although the core author group in college students' entrepreneurial psychology research is gradually forming in China, scholars' cooperation is less. A sizeable professional research team has not yet formed, which is not conducive to conducting in-depth research. From the fund support perspective, the fund project support of provinces, prefectures and cities, and universities is relatively strong, but the national level's fund support is still weak. Researchers should carry out extensive and in-depth cooperation, while the research content should be further developed, not limited to the status quo investigation. Further exploring the deep psychological factors of college students' entrepreneurship is conducive to better psychological counseling for college students' entrepreneurship, cultivating their entrepreneurial enthusiasm, and providing good psychological counseling for college students' employment.

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