REVIEW

Research on Career Identity in China: A Literature Review

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ABSTRACT

Career identity is one of the important topics to study the psychological problems of employees, especially after the outbreak of CoV-19. Being a populous country in the world, China has a large number of employees from all walks of life, and its research on career identity has attracted more and more attention. Thus, this study aims to sort out the history, characteristics, and trends of the research on career identity in China through a literature review, which can help more scholars pay attention to China's career identity research. In this study, Citespace is used to statistically analyze the selected literature from China's National Knowledge Infrastructure (CNKI) and Web of Science (WOS). The results show that: (1) The historical evolution of career identity research in China can be divided into three stages: germination, development and maturity. (2) From the perspective of coop-eration between authors and institutions, researchers tend to do independent research, mainly focusing on the research in the field of psychology. (3) From the key words, career identity and employability are the main high-frequency words. (4) From the cluster analysis, the research focuses mainly include social support, teachers' career identity, influencing factors, and job involvement. (5) From the emergent analysis, it can be seen that the research on roles and differences between urban and rural areas is weakening, and the research on factors such as job satisfaction is gradually strengthening as the frontier theme. Finally, according to the existing analysis results, this study predicts the future trend of career identity in China and thinks that it will extend from the fields of concept explanation, interdisciplinary research, scientific research tools, and so on.

KEYWORDS

Career identity; scientific knowledge maps; historical evolution; research hot spot; career education

1 Introduction

Career identity is an important concept in the field of career development and starting point for individuals to seek professional value in their careers, which affects the stability, satisfaction, and enthusiasm of individuals engaging in a specific occupation [1]. This is not only related to individual

career development but also to the stability of the entire enterprise and society [1]. Since this century, the whole world's attention to the field of career identity is increasing year by year. The concept of career identity was first developed from the Ego-Identity Theory in psychologist Erikson's personality development theory, which pointed out that people are faced with conflicts between self-identity and role confusion [2,3]. The definition of personal self-awareness and the formation of self-concept in this period are called self-identity [4]. However, according to the research directions of different researchers, the concept of career identity has not formed a unified definition [5,6]. For example, Page-Jones et al. [7] described career identity as the way an individual thinks about his or her interests and abilities regarding career goals, once there is clarity and consistency around what constitutes the self, occupational decisions can be made. In the study of sports students, career identity is considered a dynamic exchange between personal and social factors, which interact to form a person's sports identity and often affect motivation [8] and academic [9] and career goals [10]. To sum up, although the definitions of career identity are different in different studies, they all point out the influence of the object on the development of the occupation and future career development. Besides, the definition of career identity in the world was more inclined to describe the profession itself because the research object and content were limited to employed people at the beginning. In this period, "Professional identity" and "Vocational identity" were adopted more. With the development of research gradually spread to other fields, researchers found that career identity is not limited to the profession itself, but more is the individual's identity and views on the career of one's life. Therefore, follow-up studies gradually began to use "Career identity" as a term.

The first conceptual explanation of career identity in China refers to the same level of workers having the same or similar views on their social status and things related to their social status, which leads to the gap between this level and other levels of workers [11]. At the same time, the research on career identity in China is also influenced by the career theory and research put forward by early international scholars. For example, Holland's vocational interest theory divides vocation into six types, and the perception of vocation will be different due to different vocations. At this time, the research is biased toward "vocation". Later, Marcia put forward the concept of identity achievement and elaborated on the needs, emotions, abilities, and goals of teenagers. This can be said to broaden the research field of career identity, not only limited to the employed people themselves but also gradually expanded to "profession". Since then, scholars such as Luyckx, Meeus, Crocetti, and Porfeli have made different studies on identity achievement and put forward more comprehensive theoretical supplements. Based on this, some Chinese scholars have gradually shifted the concept from the early "professional identity" to "career identity". However, as it is still in a period of change, any definition has not been fully recognized, which also leads to great differences and dispersion in current research.

In short, despite the late start of research on career identity in China, subsequent studies have developed rapidly and matured, receiving increasing attention from scholars worldwide. However, on the one hand, the review of articles reveals that the current research findings are relatively scattered and the research hotspots are complex and diverse. On the other hand, the research on influencing factors and frontier topics is also crucial to career identity. However, although the existing research has summarized some countries, there is no evidence from China, which makes it difficult for scholars to systematically grasp the development history, research focus, and major researcher distribution of career identity in China. By summing up the recent findings, this paper hopes to promote this research topic. According to the bibliometric analysis of big data, knowledge visualization is an important aspect of scientific research, which is conducive to the development of a new research topic. CiteSpace, the knowledge-visualization software, is used in this scenario for comparative and bibliometric analysis. Therefore, this paper attempts to use Citespace, to count the published research on career identity from China and sort out the development history and research hotspots at each stage. At the same time, this paper analyzes the characteristics of career identity based on a holistic perspective to provide scientific theoretical and data support for future research on

career identity in China and to help international scholars understand the current development of career identity in China.

2 Materials and Methods

2.1 Data Sources

In this study, CNKI was mainly used to collect data. The main reason for choosing this database is that CNKI collects all articles published in Chinese and covers international English articles. To ensure the collection of all articles as much as possible, this study uses WOS (the most widely used and trusted database of research publications and citations) to supplement the articles published in English. The advanced retrieval function of CNKI is used to search the articles published before January 10, 2022. As mentioned above, because there are different opinions about career identity in the world, this study uses a variety of keywords to search as much as possible and screens the collected documents one by one. Chinese articles use "career identity" as the keyword, and English articles use "China + career identity or professional identity or vocational identity" as the keyword. The reason why three terms are selected for retrieval is that, as mentioned earlier, there is no unified statement of the term career identity, and more keywords are needed to ensure that the articles are retrieved as much as possible.

This study followed the search strategy and obtained legitimate data in strict accordance with the inclusion criteria. For further analysis, full records and cited references were downloaded in plain text format. Duplicate and irrelevant studies were removed by two researchers. Finally, a total of 587 related articles were selected, which include 412 Chinese articles and 175 English articles. Periodicals are the main published articles. Dissertations, conference articles, news articles, literature reviews, and other articles from China are mostly protected and it is difficult to obtain all of them, so they are deleted. The specific screening process is shown in Fig. 1 below. It is worth noting that, since Chinese articles occupy the majority, this study translated the main analytical factors such as titles, abstracts, and keywords of English articles into Chinese and incorporated them into the whole study. The final results are translated into English to ensure the research efficiency and readability of international scholars.
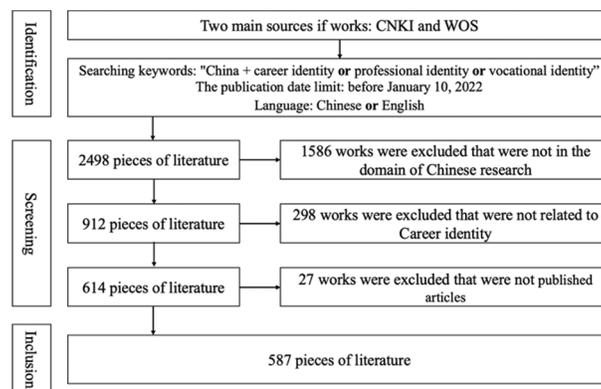

Figure 1: Screening process

2.2 Research Methods

This study uses CiteSpace as a research tool. CiteSpace is an information visualization software that uses Java language development, which is mainly based on the theory of total lead analysis (Co-Citation) and diameter network algorithm (PathFinder), etc., to measure the domain-specific articles (set) on the critical path of a explore field evolution and the turning point of knowledge, through a series of the visual map drawn to form the analysis of the subject evolution potential dynamic mechanism and subject

development frontier detection [12]. The visualization method is adopted to present the structure, rule, and distribution of scientific knowledge, which can clearly and intuitively grasp the hot topics, theoretical evolution, and research frontier trends of the articles.

3 Results

3.1 The History of Career Identity in China

This study used visual analysis to obtain the annual trend of career identity published in Chinese and English articles, as shown in Fig. 2. CNKI and WOS collected the first articles related to career identity in 2002, which was considered the beginning of the research on career identity in China. Therefore, starting from 2002, this study concluded the relevant articles collected up to the end of January 2022 and analyzed the evolution trend of China's career identity research in the past 18 years.
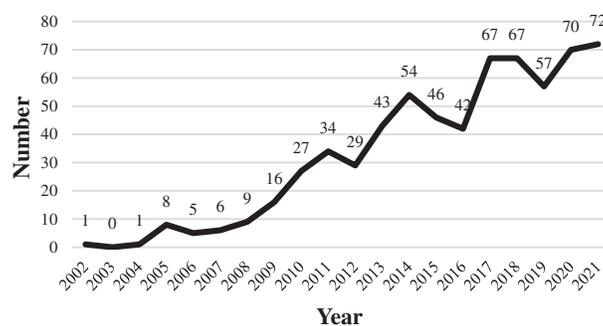

Figure 2: Annual trend of articles publication

Generally speaking, the study of Chinese career identity is in the stage of rapid development. From 2002 to 2004, as the germination stage of the study of career identity, less than one paper was published every year, and the main research was to use career identity as an auxiliary dimension to explain the relevance of the main research. At this stage, there is neither an in-depth theoretical analysis nor a systematic research method. The period from 2005 to 2017 is the development stage of research, and the number of studies related to career identity is increasing, especially the publication rate of articles from 2016 to 2017, and the number of published articles reached 67. At the same time, the research contents are gradually diversified, such as the co-occurrence analysis and clustering research of keywords as shown in Fig. 3, which leads to more scientific research methods and measurement tools. Since 2017, as the maturity stage of research, the overall growth rate of published articles has been flat and declined briefly, but the overall number of articles research is still higher than in the previous period. Therefore, this study judge that career identity can be divided into three stages: germination, development, and maturity. And it is still a research hotspot, and not only the theoretical application scope is being further expanded, but also the research focus and methods are being further refined. The details of the specific development stage are as follows.

3.1.1 Germination Period (2002–2004)

At this stage, career identity was first applied to the study of enterprise-class relationships. When analyzing the career identity of employees at different levels in enterprises, researchers regarded career identity as the main analysis dimension, so the concept of career identity can be introduced into people's thinking range [11]. Thus, at this stage, due to the nature of the research object and its work, career identity is more called "vocational identity". Besides, in the study of journalists' career posts, the concept of career identity theory is further linked with career development, and the crisis of early journalists' career identity, imperial examination complex, and cultural identity are expounded. The career

consciousness and psychological state of early journalists and their influence on journalism are investigated and analyzed [13]. So many researchers also called career identity as "professional identity". It can be seen from the two articles in the germination period that the initial research on career identity is linked with employees, especially the career development of employees. As an analysis of the research on the dimension of workers, the research on career identity at this stage is sporadic and loose, and there is no systematic research method.
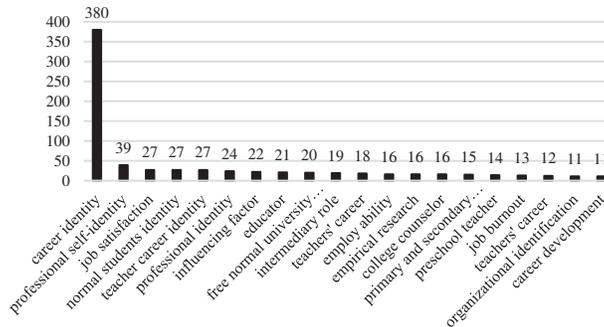

Figure 3: Topic distribution

3.1.2 Development Period (2005–2017)

At this stage, the number of China's articles research on career identity increased significantly, and the research topics were diversified, which is mainly manifested in the following three aspects.

Firstly, the research at this stage began to combine career theory with psychological theory, and career identity gradually became the core keyword of the research. In the articles published in this period, the concept of career identity was first expounded from the psychological point of view. Career identity is an individual's positive evaluation of occupation, which can overcome the externality and sense of alienation. At the same time, career identity is the result of the internal unity of personal value and the value of occupation, and the career motivation formed by it is more conscious and active [14]. In addition, job satisfaction is found to be not only an important concept in the field of psychology but also a hot spot in the field of career theory research [15]. It can be seen from Fig. 4 that job satisfaction has become one of the high-frequency keywords in the study of career identity. Studies have shown that job satisfaction plays an intermediary role in the relationship between graduates' career identity and emotional commitment, and graduates with high career identity will be more satisfied with their jobs and realize the value and significance of life in a job [16]. It can be seen that the theories from different fields incorporated in this phase are all aimed at better studying the role and influence of career identity in different fields, and the scope of research on career identity is broadened.
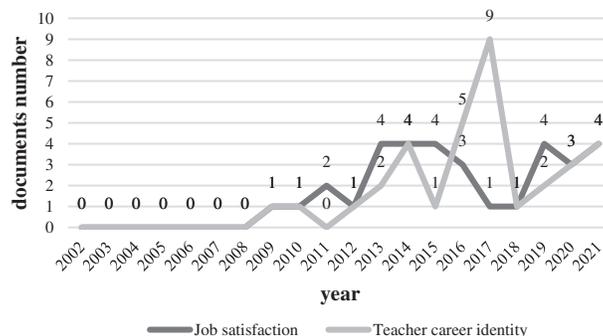

Figure 4: Distribution of "Job satisfaction" and "Teacher career identity"

Secondly, career identity is closely related to specific career development, especially the research on teachers' career identity has become the focus of this stage. The research on teachers' career identity involves various fields, such as university teachers, primary and secondary school teachers, kindergarten teachers, rural teachers, vocational college teachers, special education teachers, etc. A study first summarizes the concept, research methods, and current situation of foreign teachers' career identity, analyzes and discusses the main characteristics, existing problems, and research prospects of teachers' career identity [17].

Thirdly, the proportion of quantitative research began to increase, such as the use of scales and questionnaires. Empirical research has been paid more and more attention to. Based on the four factors of occupational value, role value, occupational sense of belonging, and occupational behavior tendency, some researchers developed the career identity scale for primary and secondary school teachers and used it as a tool to measure the career identity of primary and secondary school teachers in China [18]. In addition, other studies have analyzed the internal structure and characteristics of normal students and teachers' career identities utilizing articles analysis, interviews, and questionnaires. As a result, the scale of normal students' and teachers' career identities has been obtained with high reliability and validity. At the same time, it is considered that career identity should include three factors: career value, teachers' willingness, and behavior of career development [19].

3.1.3 Maturity Period (2017-Present)

After entering the mature stage of research in 2017, the research has not been dispersed, but the research in the development stage has been discussed in depth. The outstanding characteristics of this stage of development can be summarized in the following two points.

On the one hand, the application of theory is more and more extensive, and the application of models and scales is more rigorous [20,21]. Based on the cognitive model of empowerment and the theory of social identity, some researchers explored career identity and its relation to career anchors and career satisfaction, key demographic and job variables, specific to convention and exhibition (C&E) industry professionals in Asia. The result indicated that the majority of C&E professionals displayed a strong cognitive and affective identification with their careers in the C&E industry. However, career identity varied significantly with the time respondents had been in the industry, job seniority, and age [22]. At the same time, some studies have constructed the theoretical model of teachers' career identity and developed the evaluation scale of teachers' career identity in the model construction and scale compilation [23].

On the other hand, the research includes more and more diversified occupational objects. Since 2017, besides educators, the research investment in workers in other professional fields has gradually increased, especially medical workers, news media practitioners, journal editors, and so on [24]. At the same time, there are different research objects, such as urban sanitation workers, migrant workers, and couriers [25].

3.2 The Development Status of Career Identity in China

To understand the development of a research field, apart from its history, its current development should be analyzed, including researchers, research institutions, research hotspots, and so on. Citespace can effectively analyze the authors, institutions, scope of research, and future research trends in the literature, a part of the review that is difficult to do with other literature reviews. Therefore, in this part of the study, this study analyzed collaborative mapping, keywords co-occurrence, main research hotspots, research frontier topics, and evolution of hot spots separately with the help of the analysis function of Citespace. It is ensured that in addition to analyzing the content of career identity, there is also awareness about the researchers and institutions. This will not only help international scholars to build more collaborations in future research based on these contents, but also to have accurate control of the frontier themes of career identity.

3.2.1 Collaborative Mapping Analysis

(1) Author collaboration atlas

In this study, the authors are analyzed by Citespace's cooperative map function, and it is found that there are 55 authors in the cooperative map, who have two or more articles in the field of career identity. To solve the problem that the authors' names are all in Chinese, the data of the six main authors are screened according to the standard that the number of articles is greater than or equal to four.

As shown in Table 1, most articles were published after 2011, which indicated that the career identity field can attract scholars' continuous attention in 2011. The six authors' main research areas are higher education, and career identity, as a category of higher education, which attracted lots of scholars in this field. In addition, many authors pay attention to the research fields of educational theory and management of career identity, as well as psychological research fields such as learning motivation and mediating effect of career identity. However, in the author collaboration atlas, it is found that these 55 authors have published 91 articles, accounting for 17.7% of the total articles, which indicated that the number of authors who do continuous thematic analysis in the research of career identity is less, and it can be speculated that authors are more likely to conduct independent research in the field of career identity.

Table 1: Authors with 4 or more articles in the field of career identity

Main Author	Year	Frequency	Institution	Major research areas
Zhao et al. [26]	2011	6	Beijing Normal University	Higher education; Psychology
Zhang et al. [27]	2011	6	Beijing Normal University	Higher education; Biology; Educational theory and educational management
Wang et al. [28]	2014	4	Southwest University	Educational theory and educational management; Psychology; Higher education
Qiao et al. [29]	2011	4	Beijing Normal University	Higher education; Sociology and statistics; Educational theory and educational management
Zhang et al. [30]	2015	4	Hunan University of Traditional Chinese Medicine	Psychology; Educational theory and educational management; Higher education
Zhang et al. [31]	2015	4	Hunan University of Traditional Chinese Medicine	Higher education; Educational theory and educational management; Psychology

(2) Institutional collaboration atlas

Besides the scholars who know about the research career identity, the role of research institutions cannot be ignored, which is very helpful for other scholars to follow up research and seek cooperation. Therefore, based on this, this study further analyzes the main research institutions. As can be seen from Table 2 that there are 17 articles in the School of Psychology of Beijing Normal University, which can be considered an important institution for the study of career identity in China. In addition, there are three major institutions related to psychology, including a journalism school, an education school, and a nursing school, which shows that the main research force in the field of career identity is concentrated in the field

of psychology. At the same time, from the analysis results of the institutional collaboration atlas, it can be concluded that the research of career identity in China is not mainly in the form of cooperation and is concentrated in a few colleges and universities, and the scope of research institutions involved is relatively narrow.

Table 2: Institutions with four or more articles in the field of career identity

Institution	Frequency	Year	Region
School of Psychology, Beijing Normal University	14	2010	Northern China
School of Journalism, Renmin University of China	4	2018	Northern China
School of Education, Soochow University	4	2014	Eastern China
Mental Health Education and Research Center of Southwest University	4	2013	Southwest China
Department of Applied Psychology, College of Humanities and Social sciences, Hunan University of Traditional Chinese Medicine	4	2015	Southern China
School of Nursing, Hunan University of Traditional Chinese Medicine	4	2015	Southern China

3.2.2 Keywords Co-Occurrence Analysis

Co-word analysis is one of the content analysis methods, and its principle is to count the number of times a group of words appear in the same document in pairs and carry out cluster analysis, and then analyze the structural changes of disciplines and topics represented by these words [32]. In this study, CiteSpace 5.6. R2 was used to analyze the co-occurrence of keywords in the collected articles. In the condition setting, the period of this study is 10 years (2002 to 2022), and the single time zone is 1 year (there are 19 single time zones). The threshold of analysis is set at 2, 2, and 20, which means keywords must meet three conditions: occurrence times equal to or greater than 2 times, keyword co-occurrence times equal to or greater than 2 times, and similarity coefficient between keywords equal to or greater than 0.20. Finally, the analysis results showed that there are 398 nodes, 726 links, and keyword co-occurrence maps with a density of 0.0079. As there are English and Chinese words in the original data, to ensure that all readers can accurately understand its meaning, this study has converted it into both English for presentation. At the same time, this study mainly chooses keyword co-word analysis to mine journals related to the field of career identity, and the specific results are shown in Fig. 5. The size of each circle indicates the frequency of keywords. The larger the circle, the more the corresponding keywords appear [12].
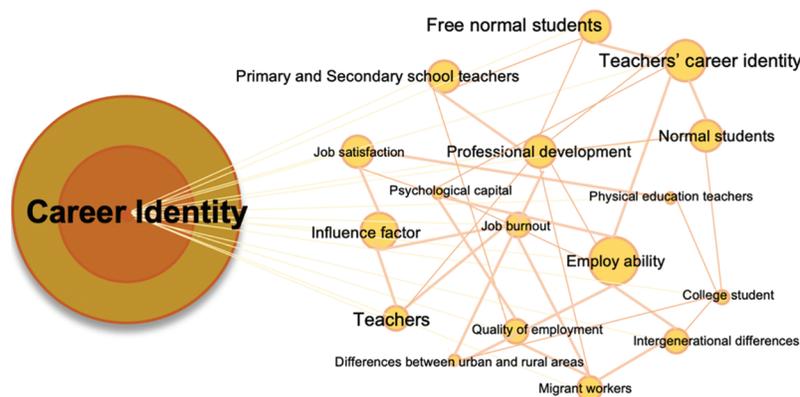

Figure 5: keywords in the field of career identity

It can be seen from the results shown in Fig. 4 that after excluding the keyword career identity, the related words in the figure still focus on career identity and its research object, and the research objects mainly focus on teachers, normal students, migrant workers, etc. The influencing factors mainly discuss the effects of employability, job satisfaction, and the urban-rural gap. It is worth noting that, from the perspective of knowledge theory, keywords with high frequency and centrality are generally the common concern of many researchers for a while, that is, the hot spot and frontier of research, so future research should pay more attention to the keywords shown in Fig. 4.

More importantly, CiteSpace can not only draw keywords co-occurrence but also output detailed data corresponding to the map through background processing. Therefore, based on the co-occurrence map of keywords, this study outputs the cited frequency, centrality, and emergent rate of keywords in journals in the field of career identity from 2002 to 2022 through Citespace. As shown in Table 3, it can be seen that career development and object differences are the main factors in field research, and they have not been extended to other fields.

Table 3: High frequency and central keywords in career identity from 2002 to 2022

Rank	Keywords	Frequency	Centrality
1	Career identity	305	0.82
2	Employability	32	0.09
3	Teachers' career identity	27	0.11
4	Influencing factors	22	0.12
5	Migrant workers	20	0.01
6	Normal student	18	0.04
7	Intergenerational differences	18	0.00
8	Free Normal student	16	0.05
9	Employment quality	16	0.01
10	Teacher	16	0.09
11	Job satisfaction	15	0.04
12	Professional development	15	0.09
13	Differences between urban and rural areas	14	0.00
14	Primary and secondary school teacher	13	0.03
15	Professional self-identity	13	0.01
16	College counselor	12	0.02
17	College students	10	0.05
18	Occupational identity	9	0.00
19	Physical education teachers	9	0.03
20	Courier	9	0.00

3.2.3 Main Research Hotspots

Research hotspots are the research problems or topics discussed by a group of papers with internal relations and a relatively large number in a certain period [33]. The research hotspots and main directions in a certain research field can be analyzed from the clustering structure of articles' co-word network [34].

According to the data obtained from the knowledge map, the index Modularity Q = 0.70 is used to mark whether clustering is suitable, and the clustering structure is remarkable. The index of similarity degree within-cluster is 0.48, which is reasonable. In the results of cluster analysis, the top 4 clusters of cluster nodes are selected for analysis. According to the identification words with the largest weight in the first four clusters selected in this study, combined with the analysis of articles, it can be known that the hot topics of current career identity research mainly include: social support, teachers' career identity, influencing factors and work engagement.

The first ranking cluster is social support, including 56 nodes, with an internal similarity of S = 0.987, and the average occurrence year is 2011. From the analysis of identifiers, this cluster mainly studies the application of career identity in medicine and psychology. According to the articles search on CNKI and WOS, the research objects of career identity in the field of medicine and psychology are mainly medical students and nurses [35]. The research contents mainly include the status quo of medical students' career identity [36,37], nurses' career identity [24], career success [38], and job burnout [23]. For example, Liu et al.'s [39] research showed that the overall career identity of nurses was relatively low, and social support had a profound impact on the career identity of nurses.

The second-ranking cluster is teachers' career identity, including 33 nodes, with an internal similarity of S = 0.95, and the average occurrence year is 2012. The highest identifier of clustering is free normal students and pre-service teachers, which refers to the future teacher reserve training under the premise of tuition exemption and targeted employment agreement given by the state [40]. As it showed in the research on teachers' career identity, the research object mainly focuses on free normal students and pre-service teachers. Normal students are an important and stable source of teachers, and free normal students are a special kind of them. The research focuses on educational policies, training methods, employment status, and career identity. For example, Zeng et al. pointed out that, unlike free normal students, the research on pre-service teachers mainly focuses on pre-service teacher education courses, professional practice, and professional development of teachers. From the existing literature, it can be seen that there is relatively little research on pre-service teachers in China, which shows that Chinese scholars pay insufficient attention to pre-service education and practical skills training of teachers. Future research should strengthen the research on pre-service training and education of teachers while expanding the international perspective [41].

The third cluster is the influencing factor, including 31 nodes, with an internal similarity of S = 0.887, and the average occurrence year is 2015. The highest identification words of the cluster are vocational school and professional self-concept, and the main research institution is located in a vocational school according to the identification words of the cluster. Understanding the development of students' career identity and strengthening the education of career identity is not only the requirement of improving the quality of education but also the requirement of students' all-around development. In recent years, with the emphasis on vocational education put forward in China's education policy, vocational education has developed rapidly in China, and the professional development level of teachers in vocational colleges directly determines the quality of vocational education, which also extends to other fields of education. For example, Chen et al.'s [42] research showed that teachers' career identity will improve with the decrease in job burnout and the improvement in job satisfaction during the COVID-19 epidemic. Professional self-concept was put forward by American psychologist Super in career development theory, which refers to the core of a person's professional choice and professional development, and is the reflection of self-concept in professional choice and professional development [43]. It comes from the individual's understanding of self and profession, and on this basis, forms the individual's attitude towards the profession, sense of responsibility, ideal, morality and values, etc. [44]. Leng et al.'s [45] research showed that professional self-concept is closely related to the level of career identity, and it is an important influencing factor of career identity.

The fourth-ranked cluster is the work input, including 30 nodes, with an internal similarity of S = 0.895, and the average occurrence year is 2014. The largest identifier of this cluster is psychological capital and preschool teachers, indicating that the main research object is preschool teachers, and the research content is mainly the relationship between psychological capital and work input. In the past ten years, scholars in various fields have paid more and more attention to the new research direction of positive psychology, which means good psychological capital and work investment show that there is a positive correlation between organizational support, psychological capital, and work input [46]. Psychological capital plays a part mediating role in the impact of organizational support on work input. Preschool teachers play an indelible role in the education cause as a key person and the backbone of the teacher team that affects the development of children at the stage of enlightenment [47]. There is evidence that there is a significant difference between preschool teachers' psychological capital and work engagement, and psychological capital and various dimensions have a significant positive effect on work engagement [48].

3.2.4 Research Frontier Topics

Research Frontier Analysis was first proposed by Price in 1965 to describe the transitional nature of a research field [49]. Using emerging subject terms is more suitable for detecting emerging trends and sudden changes in the development of disciplines than using the most frequently occurring keywords [12]. Based on the emergent keywords and their cited historical curves detected by the CiteSpace, combined with the secondary articles retrieval method, the content analysis of the cutting-edge topic articles can be seen. There are two main types of cutting-edge topics in China's career identity research from 2002 to 2022. As shown in Table 4.

Table 4: Keywords emergence rate in the career identity from 2002 to 2022 (Top 8)

Rank	Keywords	Emergence rate	Emergence start time	Emergence end time
1	Courier	4.23	2002	2010
2	Job satisfaction	4.19	2016	2017
3	Social mutual construction theory	3.98	2002	2008
4	Migrant workers	3.74	2002	2008
5	Career identity	3.73	2002	2008
6	Professional self-identity	3.19	2016	2016
7	Urban-rural differences	3.16	2002	2009
8	Work engagement	2.93	2018	2019

On the one hand, the first category is the fading frontier theme, which removes the career identity similar to the career identity semantics. There are four fading themes, including courier brother, social mutual construction theory, migrant workers, and urban-rural differences.

Firstly, with the rise and popularity of online shopping platforms, the emergence and rapid rise of the logistics industry needs the support of a large number of human resources, so the research on the career identity of express delivery personnel has become a hot field. With the popularization and daily use of the logistics industry, research in this field has gradually decreased. Although it is a fading frontier theme, the logistics industry still plays an important role in the national economy and people's daily life. Relevant research shows that there is an obvious "short-term effect" in the career identity of courier brothers, and nine factors, such as customer attitude, labor contract signing rate, and rest frequency, are the main factors affecting the career identity of courier [50].

Secondly, Social Mutual Construction Theory is a final achievement in the continuous exploration process of sociology with Chinese characteristics [51]. It refers to taking the practical process of Chinese social transformation as the research object, emphasizing the joint role of individuals and society, to achieve the vision of harmony between man and nature and between man and society. China's social transformation needs bold and innovative practice, and social mutual construction theory is an attempt at practical sociology. With the perfection of the explanation of social inter-construction, in recent years, the research on career identity has begun to adopt the social inter-construction theory to study different social strata from the perspective of social inter-construction.

Thirdly, with the popularization of urbanization, the acceleration of the industrial process, and the economic and social transformation in China, migrant workers, a new social group, are constantly emerging [52]. According to statistics, there are about 200 million migrant workers in China in 2019, which is an important part of contemporary society and plays an important role in building a harmonious society [53]. Some studies have found that migrant workers who identify with peasant identity account for a weak majority, and a large proportion of migrant workers are in a state of vague identification with peasant identity [54]. The dilemma of career identity is not conducive to the physical and mental health and self-development of migrant workers. For the migrant workers, although they retain the status of farmers, for the time being, their future career trends are workers in all sectors of society [55]. It is an important strategy to correctly guide them to establish their career identity in the industries they are engaged in. Therefore, although it is the leading edge of declining research, the study of migrant workers' career identity is still a concern of scholars in various fields.

Finally, the urban-rural difference, that is, the economic difference caused by the coexistence of the urban economy and rural economy, is a problem that Chinese society has not solved for a long time [56,57]. China's economy has been feeding industry by small-scale peasant economy, and the agricultural economy accounts for more than half of the national economy [58]. Therefore, many scholars began to study social problems from the perspective of urban-rural differences, including the comparison of career identity under the background of urban-rural differences. For example, Wu et al.'s [59] research showed that there are great differences in the career identity between urban and rural primary and secondary school teachers, except for professional emotion, the scores of rural teachers in three dimensions of material security, environmental support, and development opportunities are lower than those of urban teachers.

On the other hand, the frontier topic should be focused on progressive frontier topics. Except for words that have similar meanings to career identity, there are two progressive topics: job satisfaction and job involvement. Job satisfaction refers to an individual's emotional response, emotional experience, and attitude to work, which is derived from the evaluation of his or her work or work experience, including satisfaction with the job itself, compensation, and promotion opportunities [60]. The research on job satisfaction is mainly divided into the following categories:

Firstly, the research on the relationship between career identity and job satisfaction [61]. Secondly, the mediating role of job satisfaction on the relationship between career identity and other variables [42]. Thirdly, there is the analysis of influencing factors of career identity and job satisfaction [62]. In recent years, job satisfaction research has become an important research area and hot spot. Therefore, only by improving job satisfaction can employees' work enthusiasm and investment be improved and the stability of the social talent structure maintained. The other progressive frontier theme is work engagement. Throughout the existing articles, scholars pay more attention to the research on the connotation and structural elements of career identity, which usually used career identity as an independent variable to examine the correlation between career identity and organizational identity, emotional commitment, and turnover intention [62,63], pay less attention to the inherent positive self-regulating power of the individual [64].

In recent years, more and more scholars have begun to pay attention to the internal influences related to career identity, including work input [65]. Previous studies have shown that career identity not only has a significant positive impact on public services' work input [66] but also exists in special education teachers [67]. In addition, the research on nurses also showed that improving nurses' career identity can enhance their sense of professional benefit and thus improve their work engagement [68]. To sum up, it can be seen that most of the current research focuses on a specific profession, and explore the relationship between the employees' job involvement, career identity, and other variables. It can be predicted that there will be more and more research in this field in the future, and the fields involved will be wider and wider.

3.2.5 Evolution of Hot Spots

The high-frequency keywords appearing in different periods can reflect the research hotspots and academic frontiers at that time. Similar to the above-mentioned division of the development period, the analysis of hot spots also produced three stages of focused research hot spots in different periods. Based on this, the analysis results of Citespace in this study are shown in Fig. 6.
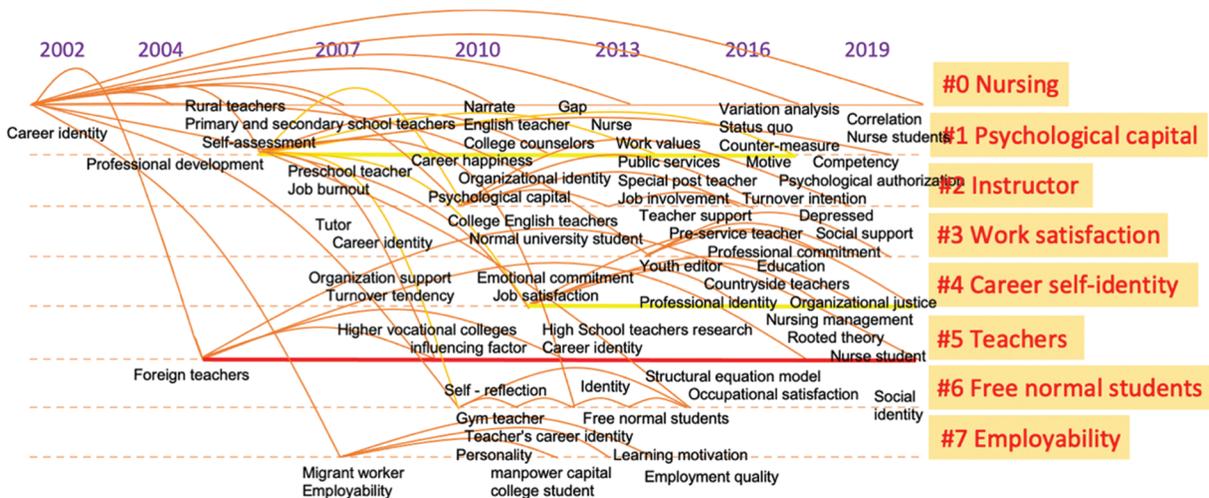

Figure 6: Time map of co-occurrence distribution of keywords in career identity

According to the time map of the co-occurrence distribution of career identity keywords, the research on career identity was in its infancy from 2002 to 2004. Zhao [11] used the keyword of career identity for the first time and promoted the research of career identity to sprout in China. From 2005 to 2017, the research on career identity gradually developed and raised, and the research keywords also tend to be diversified. Li et al.'s [69] research used community nurses to combine career identity with nursing for the first time, which promoted the continuous development of research on career identity and nursing. At the same time, career identity is closely linked with higher vocational colleges, mainly studying the development status and countermeasures of counselors, teachers, and students in higher vocational colleges. In addition, based on the maturity of career identity, it began to combine with the field of psychology. Keywords such as psychological capital, professional psychology, and psychological empowerment reflected the research results of career identity in the field of psychology. As a hot topic in the field of career identity research, free normal students first appeared in 2010. Feng et al. [70] investigated and analyzed the teachers' career identity of free normal students and its influencing factors, and provided suggestions for the cultivation of teachers' career identity of free normal students, which changed the research perspective in the field of career identity. After 2017, the study of career identity is in a mature stage, and the study of career identity in China is gradually deepened, focusing on the study of employment, and studying the effective

integration of career identity and employment from the perspective of professional psychology such as job satisfaction and employability.

On the whole, keywords such as career identity, teachers, employability, and normal school students have maintained a high degree of popularity and are closely related to keywords such as influencing factors and professional development, which reflects the importance of these topics in the field of career identity research from 2002 to 2022. Therefore, based on the logical connection of keywords, this study can clarify the theoretical progress and evolution of career identity research, and infer that the research of career identity has gone from theory to practice, which has paid more attention to the research of employment.

4 Conclusion

By combing the literature, it can be found that the research theories of career identity are constantly enriched and the research fields are constantly expanding in their infancy, development, and maturity. With the help of the information visualization method, this study obtains the analysis results of the author-institution cooperation map, keyword co-occurrence network, and keyword evolution map, which can systematically understand the research status of career identity, and comprehensively interpret the development of career identity through clustering and emergent analysis. Therefore, this study finally draws the following conclusions:

(1) The research on journal papers on career identity began in 2002, and the research on career identity was in its infancy from 2002 to 2004. During the period from 2005 to 2017, the research on career identity is in a period of rapid development, with the rapid growth of literature research and diversified research topics. After 2017, the research on career identity is in a mature stage, and the research on career identity in China is gradually deepened, and the research appearing in the development period is also discussed in depth.

(2) From the author cooperation map, few authors do continuous special analysis in the field of career identity research, and most of them are authors with only one paper number, indicating that the authors prefer independent research. From the map of institutional cooperation, the total number of articles issued by each institution is not high and the number of articles issued is small. The main research force in the field of career identity is concentrated in the psychological field.

(3) From the co-occurrence map of keywords, "career identity", "employability", "teacher's career identity", "influencing factors", "migrant workers", "normal students", "urban-rural difference", "free normal students" and "employment quality" are hot spots in the field of career identity research.

(4) From the research hotspots (clustering) and the analysis of cited literature, it can be known that the current hot topics of career identity research mainly include: social support, teachers' career identity, influencing factors, and work engagement.

(5) From the research frontier topics (emergent), we can see that the weakening frontier topics of career identity include courier brother, social mutual construction theory, migrant workers and urban-rural differences, etc. The progressive frontier topics include job satisfaction and job engagement.

(6) The research focus on career identity in its infancy is relatively single. During the development period, the keywords related to career identity tend to be diversified and research enthusiasm is on the rise. After entering the mature period, the study of career identity gradually deepened and paid more and more attention to the study of employment.

5 Discussion

5.1 Quantity and Contribution Analysis

This study uses bibliometric methods to explore the longitudinal and horizontal characteristics of career identity in China. Since the publication of the first career identity paper in 2002, the number of publications

has gradually increased up to 2022, with an upward trend. Overall, China's career identity research has made important contributions and is gradually becoming mature. However, compared with other countries that have taken the lead, the focuses and research subjects of relevant studies are relatively scattered and independent. Therefore, although in the past 20 years, China's many famous institutions and fruitful scholars led the development, however, the cooperation between institutions and scholars is small and has obvious characteristics of "individual" cooperation.

5.2 Research Resources and Fundamental

Career identity is a broad and evolving concept, not just in China but globally. Early studies have suggested that a person's ability to think about his or her interests and career goals can be considered "professional identity" or "vocational identity" once there is a clear and consistent understanding of what the self is. Then with the diversification of research subjects and the lifelong research stage, the later research believes that career identity should not only be regarded as the cognition of occupation or profession but also involves the whole life of individuals, which is the identity of "the meaning of life". This is the essential reason for the difference between "career identity" and "professional identity or vocational identity "in the development process. However, it cannot be denied that "professional identity" and "vocational identity are the early basis of "career identity".

In addition, the contributions of the main keywords, author and institutional collaboration, and other dimensions of visualization were highlighted. As we all know, in the related field of career identity, many scholars have proposed and widely applied many theories. Although many scholars are not included in this list, it does not mean that their research has not made a great contribution, as demonstrated by the top 10 commonly cited authors and institutions. At the same time, according to the findings of the studies, the most important research categories on this topic mainly focus on pedagogy and psychology, and they occupy the majority of articles. This indicates that although career identity involves multiple disciplines, important research areas have emerged. At the same time, it also explains why the research subjects involve more teachers and related professional groups.

6 Future Trend Outlook

As an important concept in the field of career development, career identity is continuously deepened in the research process and combined with psychology, sociology, and other theories. At present, Chinese researchers pay more and more attention to career identity, and the application of research results is becoming more and more practical. Sorting out the current development of career identity in China and predicting the future trend will help international scholars to enhance their attention and understanding of this field in China. Based on the current research status and achievements, this study predicts the future research trends of career identity mainly in the following aspects:

(1) The elaboration of the concept and connotation of career identity will become more diversified. Due to the continuous expansion of research fields, career identity will be combined with a variety of theories. Although the existing definitions of career identity have not been unified, the definition of future career identity is bound to be more diversified according to the different research directions of researchers. For example, since the classification of career involves different fields, in addition to the existing psychological and career theories, there should be definitions of career identity from the perspectives of theories from sociology, education, anthropology, and other disciplines. This is not only beneficial for career identity to be recognized by more fields, but also for other fields to value the role of career identity in career development research for people in their fields.

(2) Strengthen interdisciplinary research. The concept of career identity was first developed in the field of psychology in foreign countries, and the early research in China was mainly focused on the field

of psychology. With the depth of research, there are hundreds of classifications of occupations themselves, plus more fields are beginning to focus on the study of career identity, such as education, journalism, medicine, etc. However, as the existing research still limits the study of career identity to one field, no cross-field research has been seen. Therefore, there is a need to further strengthen the research on career identity between different fields in the future to promote the comprehensive development of career identity research.

(3) Research tools are more scientific and localized, especially in the development and use of scales and questionnaires and the adoption of other research methods. Since career identity research was first introduced from abroad, foreign research results were more or less used as references in the actual research process, which led to certain biases in the early domestic research results and reduced the persuasiveness of the research findings. Therefore, the development and application of localized research tools will become a necessary task in future research. In addition, the existing studies have adopted a single quantitative approach, but the factors influencing career identity cannot be defined by the data alone. Future studies will certainly need to expand the research on the factors influencing career identity from a "human-centered" perspective by adding more qualitative studies such as interviews and observations.

(4) Collaborative research between authors and institutions will gradually increase. The analysis of the literature review shows that Chinese scholars, unlike foreign scholars, prefer to conduct independent research, and few have done the continuous thematic analysis, which is unfavorable to the development of career identity in China. Although there are teams that frequently collaborate, they are few and most of the collaborating authors are concentrated in the same institution. With the increase of interdisciplinary and cross-disciplinary exchanges, the collaboration among authors from different institutions is expected to deepen further in the future. This trend can promote cooperation and exchange between scholars and institutions in the field of career identity and promote the in-depth development of career identity research. This is also the reason why the analysis of authors and institutions is included in the statistics of this study, hoping that this will enlighten scholars to participate more in career identity and collaborative research.

(5) The study of career identity will involve more occupations and industries. Compared with the previous studies, most of them focused on teachers, counselors, and other occupations, but rarely students. However, in recent years, the study of career identity has paid more and more attention to "normal students" and "free normal students". In addition to education, the research investment in the fields of medical staff, journalists, migrant workers, and new occupations such as delivery workers and couriers is increasing. Therefore, future research in the field of career identity will turn to more different occupations and industries. Also, more emerging occupations are bound to receive attention from the research on career identity.

7 Limitations

There are some limitations to this study. First, because the study's research cycle was at the beginning of 2021, it was not able to include more new studies in a more timely manner to participate in the analysis. Second, unlike traditional literature reviews, this study used the Citespace tool for data-based analysis, which has better explanatory implications for capturing the authors, institutions, and topics of the literature, but does not allow for a comprehensive analysis of each element specifically. Finally, the results of this study are based on the researchers' perceptions and the prediction of future research trends, which will inevitably lead to unpredictable results as time goes on and research develops.

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