HOTSPOTS AND VISUAL ANALYSIS OF RESEARCH ON CORE COMPETENCIES OF COLLEGE COUNSELORS

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Abstract: This study used China National Knowledge Infrastructure (CNKI) as the data source and selected 128 research articles on the core competencies of university counselors published between 2010 and 2024 for analysis. The CiteSpace analysis tool was used to visualize the literature, and the results showed that the research on the core competencies of college counselors in China began in 2016 and has undergone stages of explosive and deepening development; The research focuses mainly on the distribution of disciplines in education; Most researchers tend to conduct research independently, with limited collaborative power and only a few small-scale collaborative teams present, resulting in relatively insufficient cooperation between different institutions; Research hotspots focus on areas such as counselors, core competencies, universities, the new era, and moral education; The core competencies of college counselors are mainly clustered into eight core topics: counselors, abilities, universities, ideological and political education, ideological and political education, vocational colleges, cultivation, and character literacy. The research results suggest that future research can expand the scope of disciplines, strengthen cooperation between authors and institutions, innovate the cultivation mode of counselor core competencies, optimize the constituent elements of counselor core competencies, and promote the professionalization and professionalization of counselor teams. These will become important hot topics of concern for major universities and researchers in the future.
Keywords: College counselors; Core competencies; Visual Analysis; CiteSpace; Knowledge Graph

1 INTRODUCTION

The core qualities of counselors in universities are a solid, diverse[1], and outstanding set of abilities demonstrated in the practice of ideological and political education of college students, which are essential elements that drive the high-quality development of ideological and political education and the personal value realization of counselors[2]. This has a decisive impact on the deepening of counselor education effectiveness and the long-term planning of their careers. In the context of the new era, counselors as the backbone force in universities to implement and deepen ideological and political education, the cultivation of their core qualities is particularly urgent and important. This quality not only affects the personal career paths and professional abilities of counselors, but also profoundly influences the healthy growth of students and the comprehensive development of their overall quality[3].

Therefore, a thorough exploration of the cultivation strategies of core qualities of counselors in universities in the new era is of great significance for enhancing the overall quality of higher education and inspiring students' innovative vitality at work. In recent years, the issue of core qualities of counselors in universities has become a hot topic in the field of higher education research, aiming to explore how to effectively construct and enhance this key ability system. However, there is still a lack of systematic review, analysis of hot topics, and future trends prediction in the research on the core qualities of counselors in universities in China. The lack of comprehensive and in-depth literature reviews to integrate the latest research findings, guide practice, and promote the continuous deepening of research in this field is evident. In view of this, there is an urgent need to carry out systematic literature review and in-depth analysis work to fill this research gap, provide theoretical guidance and practical references for the cultivation of core qualities of counselors in universities, and thereby promote the vigorous development of related research.

2 RESEARCH METHODOLOGY

2.1 Data Source

This study utilized the China National Knowledge Infrastructure (CNKI) as the main data source, employing an advanced search strategy to ensure the accuracy and comprehensiveness of the literature. In order to guarantee the reliability and precision of the research findings, the literature search was limited to the period from 2016 to 2024, with the final search conducted on July 26, 2024. A targeted search was conducted by subject, initially retrieving 138 relevant articles. Subsequent rounds of screening eliminated 10 articles with lower relevance to the research topic, resulting in a final selection of 128 highly relevant and effective literature samples. This information was then organized, exported in a format compatible with Refworks literature management software, and served as the foundational data and core source material for this study.

2.2 Research Methodology and Tools

CiteSpace is a visualization analysis software based on the Java language developed by Professor Chaomei Chen, a Chinese-American scholar[4]. It utilizes visualization techniques to analyze hidden knowledge in literature data, demonstrating the structure, patterns, and distribution of scientific knowledge[5]. This software has demonstrated superiority and precision in analyzing the panoramic information, hot topics, research frontiers, and development processes of a particular discipline or technical field[6], as compared to traditional literature reviews, it has the advantage of comprehensive and objective data analysis[7]. Therefore, this study primarily utilized CiteSpace 6.2.R3 information visualization analysis software and Excel to visually analyze Chinese literature on core competencies of counselors collected from the China National Knowledge Infrastructure database. By delving into and analyzing citation data, the aim is to comprehensively understand the publication status, research hotspots, frontiers, and trends in the study of core competencies of counselors in Chinese universities, providing a theoretical basis for further related research[8].

3 DATA ANALYSIS AND INTERPRETATION THROUGH GRAPHS

3.1 Publication Overview

The dynamic changes in the number of publications are a direct indicator of assessing the development trends in a specific research field, revealing the evolution process of that field. Figure 1 illustrates the annual distribution trend of research outcomes on core competencies of university counselors. Through this figure, a systematic analysis reveals that from 2016 to 2021, research activities on core competencies of counselors significantly increased. This enhancement is not only reflected in the continuous growth of publications but also indicates a wide expansion of the research field and deepening of research content. This shift demonstrates that the field has attracted widespread academic attention and has become a research hotspot. However, influenced by various uncertainties, the growth path of publications during this stage shows some fluctuations, reaching its peak in 2021. This marks the explosive period of diversification and rapid development in research on core competencies of counselors. From 2022 to 2024, despite a decreasing trend in the number of publications, it is still maintained at a certain level. This trend reflects the continuous interest and high level of attention in the academic community towards research on core competencies of university counselors, indicating that the field is entering a stable and in-depth development stage, namely the stage of stable deepening.
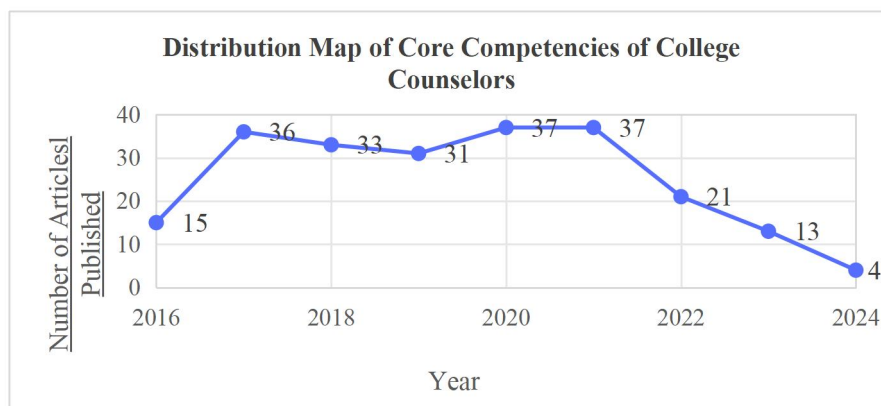

Figure 1 Distribution map of core competencies of college counselors

3.2 Visualization Analysis based on CiteSpace

This study aims to conduct a comprehensive and systematic statistical analysis of 128 literature on the core competencies of university counselors using the visualization mapping feature of the CiteSpace software platform. Through this method, the paper seeks to delve into the collaboration networks among authors in this academic field, the collaboration patterns of research institutions, as well as to identify and analyze current hot topics, cutting-edge dynamics, and future trends in research. These analytical findings will provide a scientific basis and reference for further exploration in this field.

3.2.1 Author collaboration network analysis

Co-authorship analysis is a method used to identify core authors in a specific academic field and measure the strength of their collaborations. In the diagram, the size of the nodes reflects the number of publications by each author, the thickness of the links represents the density of collaborations between authors, and the shade of the nodes indicates the chronological order of publication. Taking Figure 2 as an example, the network consists of 161 authors and 60 links, with a density of 0.0047. The diagram reveals a prominent large node, namely Li Youfu, who, according to Price's law, has published three or more articles and is considered a highly productive author. The analysis results indicate that only this author meets the criteria for high productivity. The diagram also displays several groups of authors who collaborate closely, as well as some small collaborative teams connected by only one link, suggesting that the collaborative network is not fully developed and the collaborative strength is relatively limited. Overall, the diagram illustrates many

relatively isolated nodes, with a lack of connections between different groups. In particular, emerging authors such as Li Youfu, Sheng Zhiheng, Wang Yongyuan, and Chen Lijun lack close academic collaborations within this academic field. In conclusion, the co-authorship network depicted in Figure 2 reveals the formation and distribution of core authors in the field of core competencies for university counselors. It also points out the fragmentation and limitations in current research collaborations, offering directional insights for future research collaboration and resource integration.
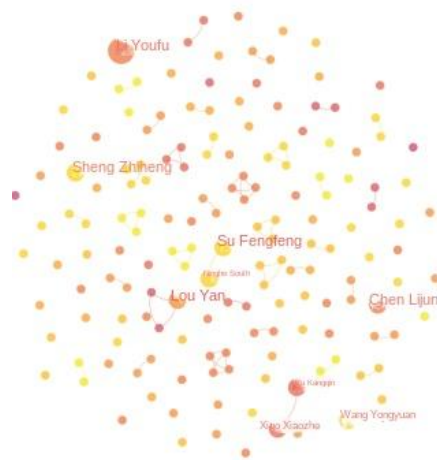

Figure 2 Researcher Collaboration Network Diagram

3.2.2 Analysis of academic influence of publishing institutions

The author delves deep into specific academic fields through publishing academic papers and participating in academic symposiums. These activities directly reflect the performance of academic institutions in terms of research scope and academic level, primarily demonstrated through the quantity and quality of academic papers published. According to the data analysis depicted in the figures, the top three institutions with the highest publication output include the Admissions and Employment Office of Taizhou University, Guangdong Ocean University, and the Humanities College of Zhejiang University. CiteSpace software visually represents research hotspots in related fields through the size and centrality of nodes. The size of the nodes intuitively displays the publication output of institutions, with larger nodes indicating a higher number of academic papers published by the institution; whereas centrality evaluates the importance of nodes in the research field, reflecting the core position and influence of institutions.

The analysis of publishing institutions in the literature was conducted using the Institution module of CiteSpace, with a threshold set at 3. Figure 3 demonstrates a network structure containing 147 nodes and 31 edges, with a density of 0.0031, revealing the degree of interconnectedness among institutions. The size of the nodes directly corresponds to the contribution of institutions in terms of publications, with larger sizes indicating richer research outcomes; while centrality quantitatively assesses the key roles and influence of institutions in the overall research network. Through visual analysis based on 128 articles, this study identified the primary research institutions in the field of core competencies for university counselors and visually displayed the collaborative status among institutions through the connections between nodes. In terms of the composition of publishing institutions, domestic universities such as the Admissions and Employment Office of Taizhou University, Guangdong Ocean University, and the Humanities College of Zhejiang University are core contributors, forming a representative cluster of publications. Despite some relatively centralized collaborative networks, overall, collaboration among institutions appears to be rather dispersed, without a clear clustering effect. This indicates that in future research, strengthening collaboration and communication among institutions, promoting knowledge sharing and resource integration, is of significant importance for advancing research in this field, as there is great potential and space for collaboration.
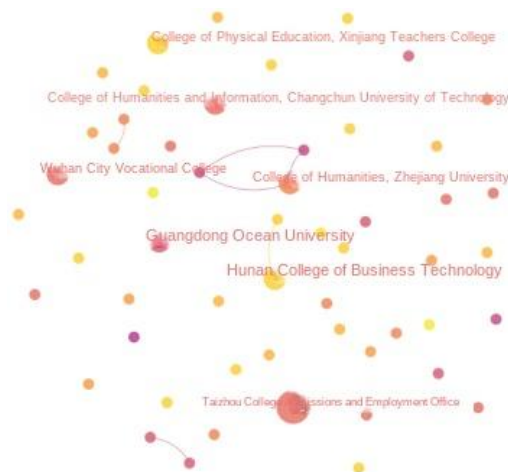
Figure 3 Mapping the Relationship between Core Competencies of College Counselors and Collaborative Organizations

3.2.3 Analysis of research trends

Using CiteSpace to analyze keywords, after merging similar words, the knowledge map of keywords is obtained as shown in Figure 4. The frequency of "core competency" is the highest, with the largest node covering the entire study period. However, this study used the search terms "counselor + core competency," and based on the two indicators of keyword frequency and centrality, the top five keywords are ranked and shown in Tables 1 and 2.

Table 1 Keywords for the Core Competencies of College Counselors in China

Hot words	Frequency	Center coefficient
Core literacy	75	0.74
Counselors	45	1.16
Universities	10	0.52
New era	8	0.03
Cultivating talents	6	0.06

Table 2 Our Research Focuses on the Core Competencies of University Counselors in China

Hot words	Frequency	Center coefficient
Counselors	47	1.16
Core literacy	75	0.74
Universities	10	0.52
Coupling relationships	1	0.24
Cultural confidence	1	0.24

Based on the analysis of Tables 1 and 2, high-frequency keywords include "core literacy," "counselors," "universities," "new era," and "cultivating talents." However, not all high-frequency keywords have high centrality. Relying solely on high-frequency keywords may not accurately determine research hotspots. In the CiteSpace software, keywords with high centrality (Centrality>=0.1) are considered as turning points in the knowledge map of keywords, to some extent representing the research hotspots in this field. In terms of centrality, "counselors" and "core literacy" serve as pivotal points in the network. Specifically, "counselors" has a centrality of 1.16, playing an effective support role in the network, while "core literacy" has a centrality of 0.74. "Counselors" and "core literacy" lay the foundation for the stability of the entire network. Therefore, "counselors" and "core literacy" are the main research hotspots, followed by "universities," "coupling relationships," and "cultural confidence."

Figure 4 displays the co-occurrence map of keywords, where the size of the nodes reflects the frequency of keywords in the co-occurrence map, and the thickness of the lines represents the centrality between keywords. Here, centrality refers to the ability of a keyword to act as a mediator in the entire relationship network. Generally, nodes with centrality greater than 0.1 are considered to have an important position in the network. Specific software statistical results can be found in Table 3. Keywords with centrality greater than 0.1 are: counselors (47), core literacy (75), coupling relationships (1), cultural confidence (1), connotation (3), ideological and political education (4), higher vocational colleges (6), pathways (3), and teams (1), as detailed in Table 2. Among them, counselors and core literacy are the largest nodes in the relationship network, indicating their highest centrality as mediators in counselor core literacy research. Following them are new era, cultivating talents, universities, ideological and political education, and team construction, representing their significant connecting and intermediary roles in the entire network and highlighting them as hotspots in counselor core literacy research.

Table 3 Keywords with a Centrality of >=0.1

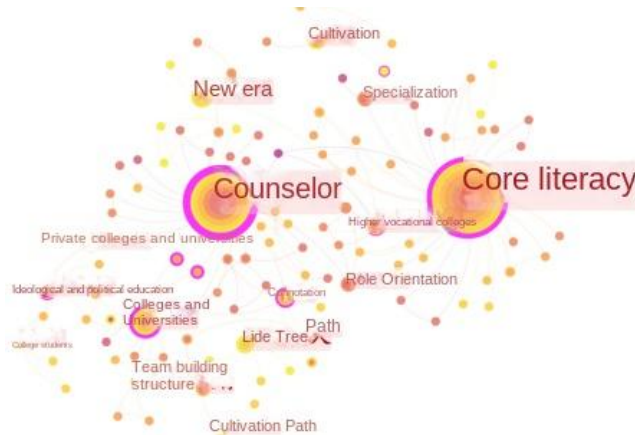| Count	Centrality	Year	Keyword	Count	Centrality	Year	Keyword
47	1.16	2016	Counselors	6	0.14	2016	higher vocational college
75	0.74	2016	Core literacy	3	0.14	2021	pathways
10	0.52	2018	Universities	1	0.11	2024	teams
1	0.24	2021	Coupling relationships				
1	0.24	2021	Cultural confidence				
3	0.21	2019	connotation				
4	0.16	2020	Ideological and political education				

Figure 4 Co-occurrence Network Analysis

3.2.4 Cluster analysis study

The LLR (Log-Likelihood Rate) algorithm was used for cluster analysis to categorize keywords, thereby identifying research topic categories within counselor core competencies. Cluster analysis was conducted using the clustering function in CiteSpace, resulting in seven clusters. The Modularity was 0.7536 and the Mean Silhouette was 0.9768, indicating successful clustering results. The eight clusters obtained were as follows: Cluster #0 Counselors, Cluster #1 Abilities, Cluster #2 Universities, Cluster #3 Ideological and Political Education, Cluster #4 Ideological and Political Education, Cluster #5 Vocational Colleges, Cluster #6 Cultivation, and Cluster #7 Character Education. Cluster #0 Counselors included keywords such as university counselors, core competencies, specialization, and enhancement strategies. Cluster #1 Abilities included keywords such as counselors, abilities, university counselors, core competencies, and qualities. Cluster #2 Universities included keywords such as team building, university counselors, moral education, and students. Cluster #3 Ideological and Political Education included keywords such as connotation, characteristics, pathways, and higher education institutions. Cluster #4 Ideological and Political Education included keywords such as ideological and political teachers, college students, and teaching quality. Cluster #5 Vocational Colleges included keywords such as business schools, core competency cultivation, holistic ideological and political education, and cultivation research. Cluster #6 Cultivation included keywords such as composition, identification, 5C model, and universities. Cluster #7 Character Education included keywords such as enhancement pathways, ideological and political education, core competencies, and counselors. Keywords Clustering Graph can be seen in Figure 5.
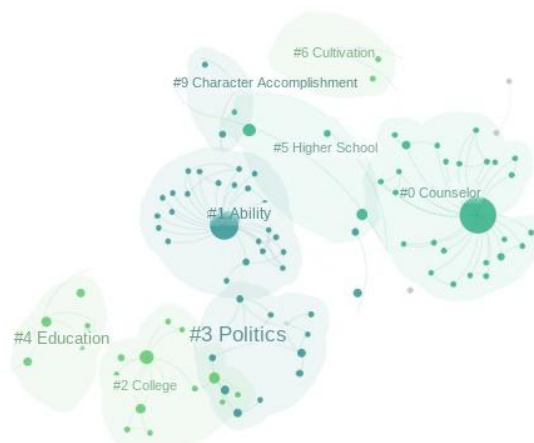

Figure 5 Keywords Clustering Graph

3.2.5 Analysis of development trends

To visually demonstrate the evolution and trends in the research area of core competencies for university educators from 2016 to 2024, we conducted a Time-zone visualization analysis. Figure 6 presents the overall Time-zone graph, with the horizontal axis representing time, showcasing the changes in keywords over time. This approach allows us to clearly observe the trends in research on core competencies for university educators. A greater number of publications during a specific time period indicates a higher level of attention given to the field by researchers at that time; whereas the links between time periods show the continuity between different stages of research, with the number of links reflecting the intensity of connections. Based on the information shown in the graph, research from 2016 to 2019 primarily focused on university educators, core competencies, cultivation, and content, aiming to explore the methods and content that affect the cultivation of core competencies for student educators. From 2020 to 2024, research on core competencies for university educators became more in-depth, with dense distribution of keywords and a wider range of research topics. Although the research focus has slightly decreased after 2023, it continues to garner attention from researchers. Overall trend analysis indicates that research on core competencies for university educators has been ongoing since 2016, with the research focus currently expanding. As time progresses, the number of high-frequency keyword nodes increases, and the research content becomes more comprehensive and in-depth. Starting from 2023, while the number of nodes remains high, they are relatively smaller in size and there is a decreasing trend in the number of publications compared to previous years, indicating that research during this period is more diverse and dispersed, with a primary focus on delving deeper into early-stage research topics.
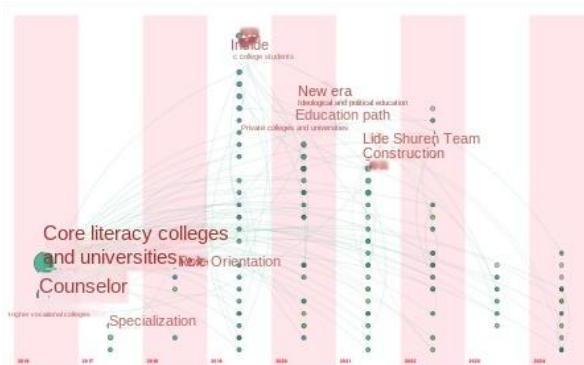

Figure 6 Keywords Timezone Analysis

4 SUMMARY AND FUTURE OUTLOOK

Through the analysis of research literature on the core competencies of university counselors in the CNKI database from 2016 to 2024, we have drawn the following conclusions:

Firstly, in terms of publication trends, the number of studies from 2016 to 2019 has been increasing annually, with the research scope expanding continuously. The peak was reached in 2020, marking a period of outbreak in research on the core competencies of university counselors. In the subsequent years from 2021 to 2024, although there is a downward trend, the research levels have remained relatively high, indicating a phase of stable deepening in the research on the core competencies of university counselors.

Secondly, when looking at the collaboration among authors and institutions, it is observed that research on the core competencies of university counselors is characterized by a dispersed institutional distribution with limited cooperation among institutions. Apart from a few research teams, the collaboration among most researchers is also relatively loose, and research on this topic lacks continuity.

Thirdly, through the observation of co-occurrence analysis of keywords, clustering, and temporal graphs, we have found that research on the core competencies of university counselors mainly focuses on areas such as counselors, core competencies, universities, the new era, and cultivating morality and educating people. This demonstrates the wide academic interest of researchers in this field.

Therefore, in future research on the core competencies of university counselors, there is a need to broaden the disciplinary distribution of research, strengthen cross-disciplinary cooperation, in order to better explore and discover the core competencies of university counselors. Additionally, it is crucial to enhance collaboration and communication among authors and institutions, innovate the model for cultivating the core competencies of university counselors, optimize the constituent elements of the core competencies of university counselors, and promote the professionalism and vocational development of the counseling team. Furthermore, it is important to explore other research hotspots, broaden research topics, and make research on the core competencies of university counselors more diverse and in-depth

COMPETING INTERESTS

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