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Hot Topics and Evolution Trends of Domestic Research on "Integration of Specialization and Innovation": Knowledge Mapping Analysis based on CiteSpace

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Abstract: In recent years, great achievements have been made in the research of "specialization and innovation integration." Based on 1,020 related papers from 2014 to 2024 in CNKI, this paper uses CiteSpace (V6.2.R2) for visualization analysis to explore research hotspots and trends from the aspects of annual publication volume, co-occurrence of authors and institutions, and co-occurrence of keywords. The results show that: "Innovation and entrepreneurship," "Talent training," "Higher vocational colleges," and "Curriculum system" are research hotspots; the number of publications has accelerated since 2017; the author's cooperation consciousness has been enhanced but the overall dispersion and the core author have not yet been formed; seven institutions have made outstanding contributions, but the situation between institutions is unclear. The research trend has experienced the evolution of "start-expansion-development." The current focus is on the implementation of the specialty, and the future may focus on the background of the Internet and artificial intelligence.

Keywords: Integration of specialization and innovation; Research hotspot; Research trend; Visual analysis

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1. Introduction

"Integration of specialization and innovation" is a teaching concept that integrates professional education with innovation and entrepreneurship education in higher education. Since the Ministry of Education put forward relevant policies in 2010, it has become an important direction of national innovation and development, aiming to cultivate compound talents with innovation ability and exploration spirit [1]. Based on this, the domestic research on the integration of specialization and innovation is increasing year by year, covering topics such as innovation and

entrepreneurship, personnel training, higher vocational colleges, and education reform. This paper uses CiteSpace (V6.2.R2) to visually analyze 1,020 papers from 2014 to 2024, so as to sort out research hotspots, development trends, and future directions, and provide a reference for follow-up research and practice.

2. Data sources and research methods

2.1. Data sources

Based on the data source of China National Knowledge Infrastructure (CNKI), this paper retrieved and collected relevant academic literature with the keywords of "Integration of specialization and entrepreneurship" and "Innovation and entrepreneurship." The retrieval started on January 1, 2014, up to April 12, 2024, a total of 1,569 articles related to the subject were retrieved. In order to ensure the accuracy and rigor of the data, relevant literatures were screened and preprocessed to ensure the extensiveness and representativeness of the literature, in order to cover the main research in this field, 1,020 related literatures were finally selected (**Table 1**).

Table 1. Data sources

Title	Content
Sources of data	CNKI
Search format	Subject = "Creative convergence"
Time span	1 January 2014–12 April 2024
Retrieval of data	1,569 journal articles
Valid data	1,020 journal articles

2.2. Methodology

CiteSpace is a software for literature analysis and knowledge mapping visualization, which can identify literature data in specific research fields and reveal research trends, knowledge clustering, and co-occurrence relationships. In this paper, CiteSpace was used to analyze the keywords co-occurrence and timeline co-occurrence of the relevant literature on "Specialization and Innovation Integration," and reveal the information of domestic research hotspots and main researchers, in order to understand its research status and development trend.

3. Overall appearance and visual analysis

3.1. Statistics

From CNKI, 1,569 articles on the theme of "Creative Integration" were retrieved, 1,020 articles were screened and processed according to RefWorks format, and then imported into CiteSpace V6.1.6. The time span was set to January 1, 2014 to April 12, 2024, and the term sources were "Abstract," "Keyword," "Supplement," and the rest were default. Nodes were selected for "Author," "Institution type," "Keyword," and subsequent mapping and measurement data [2].

3.2. Annual output

As shown in **Figure 1**, the number of research papers on "integration of specialization and innovation" from 2017 to 2024 can be divided into two stages [3]. The period from 2017 to 2018 is the embryonic stage, and there are only three papers in 2017 and 10 papers in 2018, indicating that this field has not yet become a research hotspot. From 2019 to 2024, the number of publications increased significantly, which was 8 times that of 2018 in 2019, and continued to rise in 2020. The number of articles published in 2023 reached 308, and 48 from 2024 to April 12. It is expected to surpass 2023. The overall trend is slow at first and then grows rapidly, and the research continues, indicating that the integration of specialization and innovation has become an important field of educational research and has attracted the attention of scholars [4].

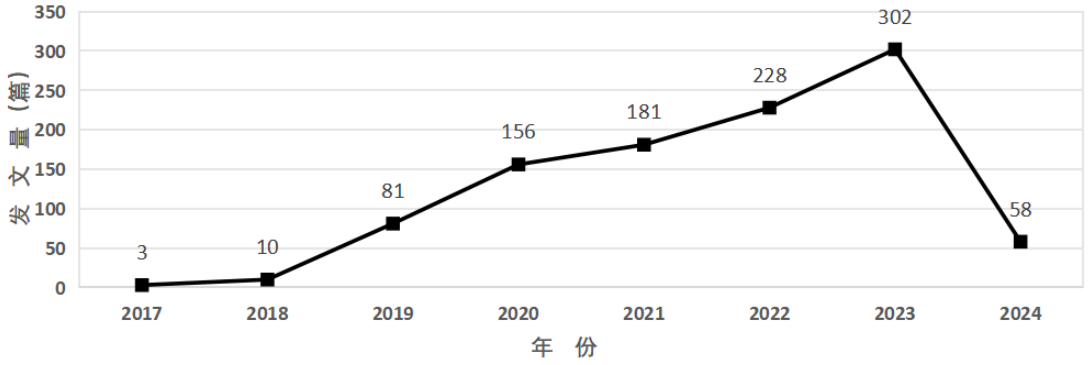

Figure 1. Annual distribution of papers on integration of specialization and innovation

3.3. Key authors and research institutions

The number of publications is an important indicator of slow research capacity. CiteSpace analysis shows that Yu Youwei, Wu Hongmei, Li Mingchu, and other authors posted the coordinates of the article (Figure 2 and Table 2). Among them, Yu Youwei, Zhang Shaoying, and Li Yan formed a close team, Xing Gaowa, Cao Qinglin, Xue Weixing, and so on also formed a cooperation. Some authors have academic cooperation, such as Li Mingchu and Yan Luxing, Zhou Yanbo and Li Wenhan, and so on. However, the overall cooperation is weak, individual publications are only up to 3, the relationship between the authors is scattered, the research is mostly individual-based, and the task is "Working alone," and the academic team collaboration still needs to be strengthened [5].

Figure 3 and Table 3 shows that among the seven institutions including Tangshan Vocational and Technical College, Guangzhou Railway Vocational and Technical College, College of Food Science of Shanxi Teachers University, etc., the first two institutions publish five articles in a single year, and the remaining four articles each, which has become an important base for the research of "integration of specialization and innovation" in China [6]. However, the research strength is scattered, a lack of influence scientific research team strength, inter-institutional

cooperation is sparse, and weak academic ties [7]. At present, the research in this field needs to expand the breadth of cooperation and promote good inter-institutional development [8].

Table 2. Statistics of articles published by core authors

Serial number	Author	Number of posts
1	Zhou Yanbo	3
2	Lee Myung Chul	3
3	Yan Luxin	3
4	Ding Wenfei	3
5	Yu Youwei	3
6	Wu Hongmei	3
7	By Zhou Tingting	2
8	Ho Wah-fan	2

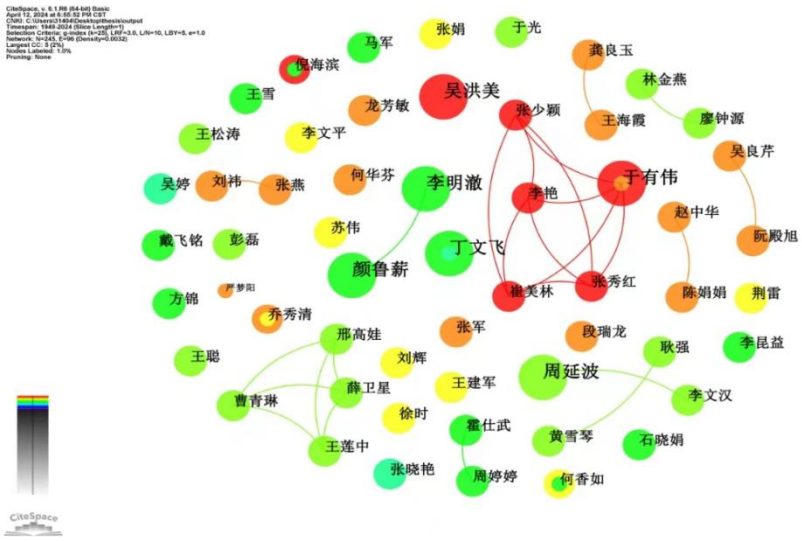

Figure 2. Core author co-occurrence map

Table 3. Statistics of publications of research institutions

Serial number	Institution	Number of posts
1	Tangshan Vocational and Technical College	5
2	Guangzhou railway vocational and technical college	5
3	College of Food Science, Shanxi Teachers University	4
4	Guangdong Vocational College of Science and technology	4
5	Changjiang Vocational College	4
6	Wuhan Vocational College of Software and engineering	4
7	Guangzhou Industrial and commercial university	4
8	Xi'an Siyuan University	3

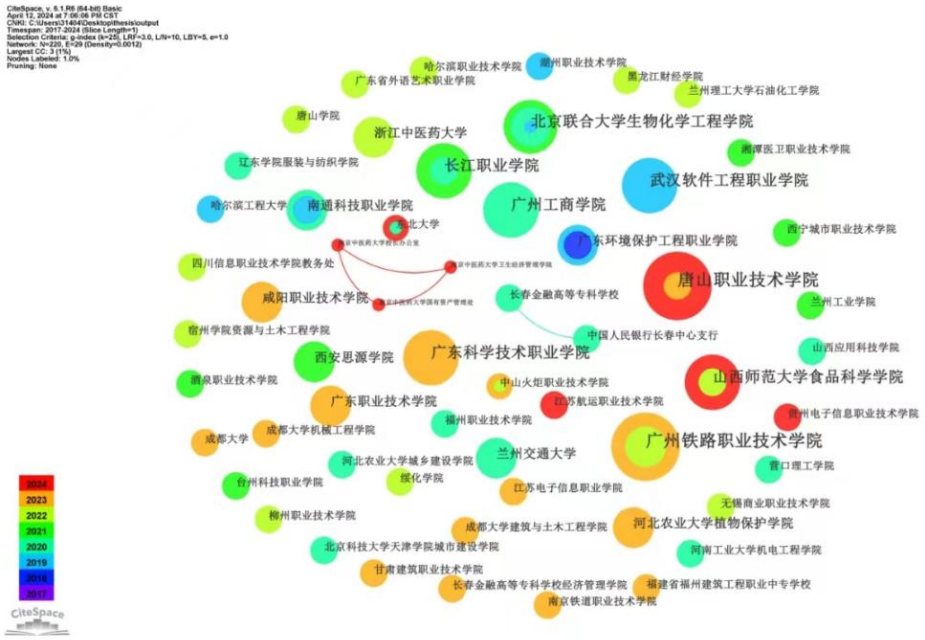

Figure 3. Co-occurrence map of research institutions

4. Hot topics and evolution trends

4.1. Hot topics

The depth of keywords can directly show the hot topics involved in the article field. By using CiteSpace software to analyze the keywords of "integration of specialization and innovation," the larger the central value, the more critical the node [9]. This results in the co-occurrence of keywords in the past 10 years (**Figure 4**).

The time slice was set to 1, and 346 keywords were obtained. The co-frequency appeared more than several times, and the map density was 0.881, indicating that the research hotspots were relatively concentrated in the past decade. High-frequency keywords include "Integration of specialty and innovation" (611 times), "Innovation and entrepreneurship" (155 times), "Personnel training" (105 times), "Higher vocational colleges" (97 times), etc., which reflects the current research focus of curriculum design in higher vocational colleges [10].

The analysis of the keyword co-occurrence map (**Figure 4**) shows that vocational colleges are the core area of the research on the integration of specialty and innovation. In 2015, the State Council proposed that vocational colleges are an important foundation for innovative talents, and promote the "full-time cultivation and integration" education to improve the quality of employment and school running [11]. Keywords with citation bursts are shown in **Figure 5**.

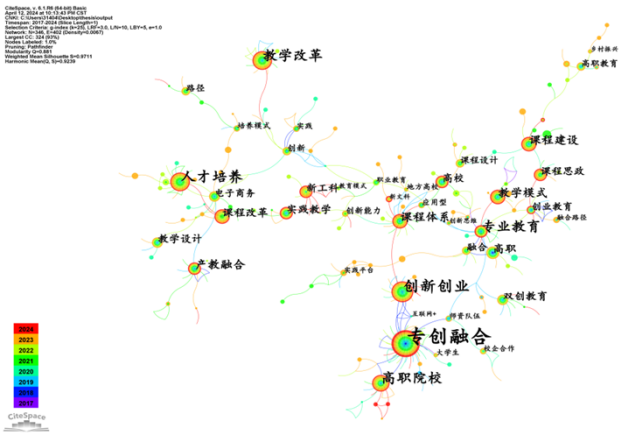

Figure 4. Keyword co-occurrence map

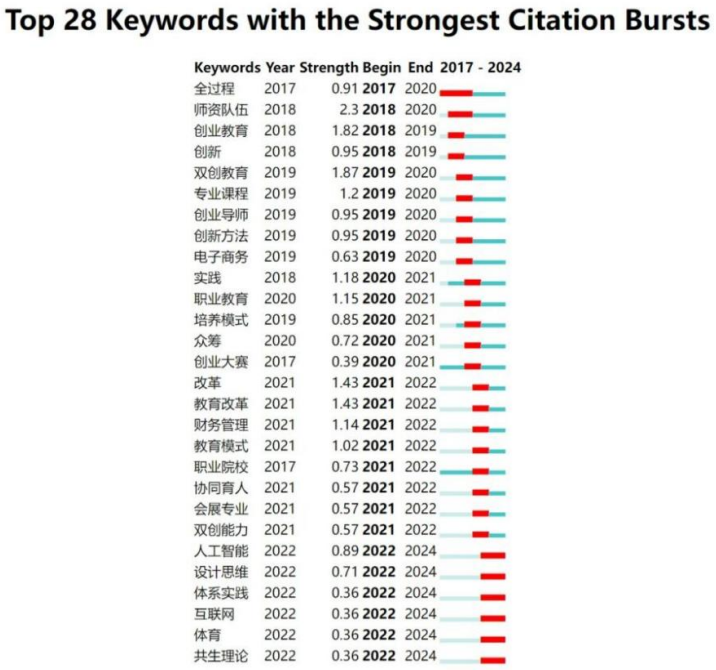

Figure 5. Highlights of keywords

4.2. Evolution trend

Based on the CiteSpace analysis method, this paper traces the research trends from 2014 to 2024, and is divided into three stages: starting from 2017 to 2018, focusing on the construction of teachers and the ontology research of innovation and entrepreneurship education, and completing the foundation of domain cognition; Expanding (2019–2021) research hotspots to entrepreneurship and innovation education, entrepreneurship tutors and e-commerce innovation, higher vocational colleges promote practical education through entrepreneurship competitions and school-enterprise cooperation; The development (2022–2024) has turned to the integration of emerging engineering/liberal arts, systematic thinking and artificial intelligence, emphasizing the innovation of interdisciplinary practice paths, and the characteristics of specialization and timeliness of research, forming the

evolution trend of deep symbiosis between vocational education and digital technology.

5. Conclusion

Based on 1,020 articles from CNKI, this study used CiteSpace to conduct a visual analysis of the research on the integration of specialization and innovation from 2014 to 2024, reveals the research hotspots and evolution trends, and draws the following conclusions:

First, the number of published papers can be divided into two stages: 2017–2018 is the embryonic stage, the research is few, and has not yet formed a hot spot; 2019–2024 is the development stage, the research is growing rapidly, and the number of published papers is accelerating.

Second, from the perspective of high-yield institutions, seven institutions such as Tangshan Vocational and Technical College and Guangzhou Railway Vocational and Technical College have made the greatest contributions. However, they have not yet formed influential authors or scientific research teams, and there is less inter-institutional cooperation; academic links are weak, and exchanges need to be strengthened to improve the quality of research.

Third, from the perspective of the core author group, the research strength is scattered, most of them are independent research, and there is less cooperation between scholars.

Fourthly, from the analysis of keyword co-occurrence and timeline, the research topics focus on "Integration of specialization and innovation," "Innovation and entrepreneurship," "Talent training," "Curriculum system," etc. The research stage is divided into start-up (2017–2018), expansion (2019–2021), and development (2022–2024). In recent years, research has gradually focused on the micro level and emphasized practicality, which may be further deepened in the context of the Internet and artificial intelligence in the future.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Ning J, Yuan X, 2023, Visualization Analysis of Research Heated Topic and Trend of "Specialization-Innovation Integration" based on Citespace. Journal of Chongqing Vocational College of Electronic Engineering, 32(05): 41–48.

[2] Zhu X, Li C, Jing W, 2022, Visual Analysis of the Research on the Integration of Professional Education and Innovation and Entrepreneurship Education in Our Country. Modern Information Technology, 6(19): 85–92 + 97.

[3] Liu Y, 2024, Feng Shan. Research on the Integration Model of Innovation and Entrepreneurship and Higher Vocational Professional Education under the Background of Digital Economy Strategy. Sci-Tech Wind, 2024(08): 43–45.

[4] Ge S, Jia J, Yan T, et al., 2024, Research on the Integration of Ideological and Political Elements in the Cultivation of Shipbuilding and Marine Engineering Talents. Pearl River Water Transport, 2024(05): 57–59.

[5] Wu W, Xiao Z, Zhu D, et al., 2024, Exploration on the Teaching Reform of Robot Practice Course of "Integration of Science, Industry and Education." Journal of Higher Education, 10(08): 15–19.

[6] Liang Z, Yi Y, Shi Y, 2024, Research on the Cultivation of Innovative and Entrepreneurial Talents in Computer Majors based on the Integration of Specialty and Innovation. Western Quality Education, 10(05): 18–21.

[7] Ge M, Ge M, Xu C, et al., 2024, Research on the Integration of Innovation and Entrepreneurship Education and Professional Education in Local Comprehensive Universities under the Background of "Three-Round Education." Economist, 2024(03): 180–182.

[8] Liu S, Pan W, Li N, et al., 2024, Research on the Teaching Reform of Comprehensive Curriculum Design of Computer Application Technology Specialty in Higher Vocational Colleges—From the Perspective of "Integration of Specialty and Innovation." Modern Commerce and Trade Industry, 45(06): 264–265.

[9] Chai Q, 2024, Research on Enhancing the Teaching Innovation Ability of College Teachers under the Background of Specialized Innovation Integration. Journal of Social Sciences, Jiamusi University, 42(01): 160–164.

[10] Guo B, Wang Y, 2024, Research on the Integration of "Double Innovation" Education into Professional Education Models and Methods in New Era Universities. Journal of Jilin Agricultural Science and Technology College, 33(01): 51–54.

[11] Wu X, 2024, Visual Analysis of the Current Research Status of Integrated Education in China based on CiteSpace. Heilongjiang Science, 15(03): 47–49.