

Fostering virtue and cultivating talents in Chinese higher education institutions: current status, research hotspots, and future prospects: A CiteSpace-Based Visual Analysis

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Abstract

This paper presents a visual analysis of 883 academic journal articles on fostering virtue and cultivating talents in Chinese higher education institutions, using CiteSpace and retrieving the articles from the CNKI database (2007–2025). The findings reveal three main characteristics in this field: rich theoretical construction but relatively weak empirical support, diverse practical pathways but somewhat limited systemic integration, and active model innovation but a tendency to lag in effectiveness evaluation. Future research could focus on constructing a measurable and assessable system for evaluating the effectiveness of fostering virtue and cultivating talents, strengthening systematic research on all-round education, promoting the application of empirical methods, and leveraging digital technologies to enable innovative educational models. These efforts may help shape a more scientific, systematic, and effective research landscape.

Keywords: Fostering Virtue and Cultivating Talents; Chinese Higher Education Institutions; Citespace; Visual Analysis; Research Hotspots; Frontier Trends

1. Introduction

Fostering virtue and cultivating talents is of considerable value to the development of education with Chinese socialist characteristics. In 2006, an important assertion was first proposed during the 34th collective study session of the Political Bureau of the Communist Party of China (CPC) Central Committee—that making fostering virtue and cultivating talents the fundamental task of education. In 2012, the report of the 18th National Congress of the CPC officially established fostering virtue and cultivating talents as the fundamental task of education, which marked a milestone. Since then, major meetings such as the 19th and 20th National Congresses of the CPC and the 2018 National Education Conference have continued to emphasize and deepen the implementation of this fundamental task, making it the core guideline running through educational reform and development in the new era. The evolution from “educating people first, with moral education foremost” to “fostering virtue and cultivating talents,” and then to “cultivating socialist builders and successors who are well-developed morally, intellectually, physically, aesthetically, and labor-wise,” profoundly reflects the CPC Central Committee’s deepening understanding of the laws governing education.

China’s educational priorities have undergone several adjustments over time. In the early years of the People’s Republic, the focus was on the comprehensive development of morality, intelligence, and physique. After reform and opening up, the emphasis shifted to serving socialist modernization. In the 21st century, greater attention has been paid to the unity of social and individual values. As the latest expression of the fundamental goal of education, fostering virtue and

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cultivating talents not only integrates the five-pronged education framework (morality, intelligence, physical fitness, aesthetics, and labor) but also highlights the political, people-centered, and strategic attributes of education. Nevertheless, Chinese higher education institutions still face practical challenges when implementing this fundamental task. These challenges include a mismatch between theoretical discussion and empirical support, inconsistency between localized practice and systemic reform, and asynchrony between model innovation and effectiveness evaluation. Therefore, systematically mapping the structure, evolutionary trajectory, and frontier trends of research on fostering virtue and cultivating talents in Chinese higher education institutions holds important theoretical value and practical significance. Such efforts may help advance this field toward deeper, more scientific, and more systematic development.

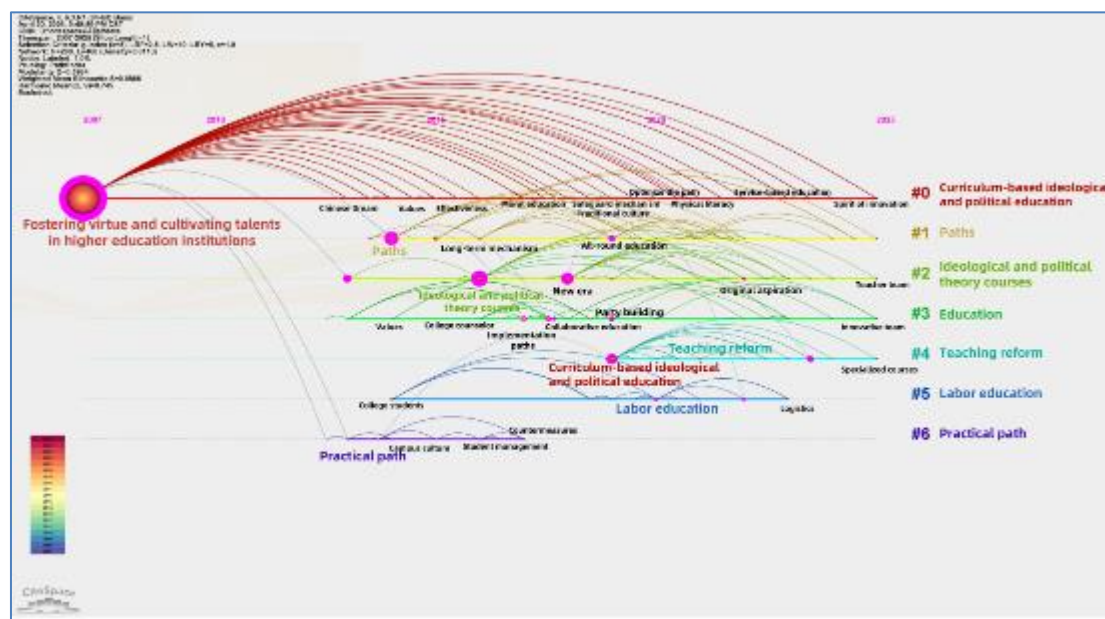
2. Methods and Tools

CiteSpace is a science knowledge mapping visualization software developed by Professor Chen Chaomei's team at Drexel University [1]. This tool enables bibliometric analysis of large-scale literature in a specific domain, drawing multivariate, time-phased, dynamic knowledge maps to identify key evolutionary paths, knowledge turning points, hotspot areas, and frontier trends [1]. To objectively depict the research progress since the concept of fostering virtue and cultivating talents was proposed, this paper uses the China National Knowledge Infrastructure (CNKI) database as the data source, conducting an exact search with the keywords "Chinese higher education institutions" and "fostering virtue and cultivating talents". A total of 883 academic journal articles published between 2007 and 2025 were selected as valid research samples. After exporting the literature in Refworks format, it was imported into CiteSpace for analysis. The time slice parameter was set to one year, and the node type was selected as keyword.

3. Results and Analysis

3.1. Overall Trend and Stage Division

This paper presents a timeline visualization of keywords (Figure 1) to help illustrate how research hotspots have evolved across different stages. According to publication volume statistics from the CNKI database, studies on fostering virtue and cultivating talents in Chinese higher education institutions have shown a generally upward trend, which closely aligns with national educational policy directions. Based on the inflection points of the publication volume curve and key policy milestones, this evolution may be divided into three relatively distinct stages.



(Source: Created by the authors based on CiteSpace software.)

Figure 1 Timeline visualization of keywords

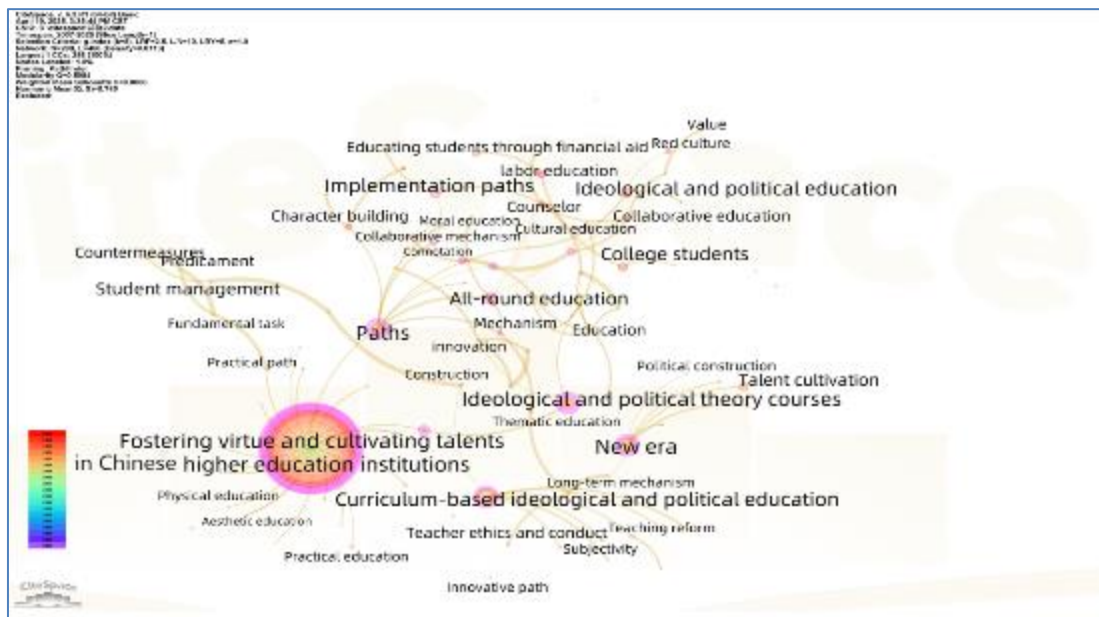
Stage 1 (2007–2011): Budding and initial stage. During this stage, annual publication volume was low but gradually increasing. After the concept was first proposed in 2006, scholars began preliminary interpretations around the idea of educating people first, moral education foremost, laying the foundation for subsequent research.

Stage 2 (2012–2016): Rapid growth stage. In 2012, the 18th National Congress of the CPC formally established fostering virtue and cultivating talents as the fundamental task of education, triggering a wave of research and a significant increase in publication volume. Scholars concentrated on exploring the connotations, contemporary value, and macro-level implementation pathways of fostering virtue and cultivating talents, shifting the research theme from what it is to how to do it.

Stage 3 (2017–present): Deepening and expansion stage. The 19th National Congress, the National Education Conference, and the 20th National Congress have continuously emphasized implementing the fundamental task of fostering virtue and cultivating talents, sustaining high research interest, and maintaining a high level of publication activity. Research themes have moved from macro-level theoretical construction to meso-level mechanism design and micro-level practical exploration, giving rise to a large number of studies on specific topics such as curriculum-based ideological and political education, all-round education, red culture, one-stop student communities, and digital intelligence empowerment. Research methods have also become more diverse.

3.2. Research Hotspots and Keyword Co-occurrence Analysis

Using the keyword co-occurrence function of CiteSpace 6.3.R1, this paper analyzes hotspots in research related to fostering virtue and cultivating talents. After importing the retrieved and organized data into the software, a keyword co-occurrence map was drawn. The time span was set from 2007 to 2025, the node selection method used g-index ($k = 8$), and the Pathfinder algorithm was applied to simplify network connections for both each time slice and overall network. The node type was selected as keyword, producing the keyword co-occurrence network map (Figure 2). The resulting map contains $N = 288$ nodes and $E = 466$ connections, with a network density of 0.0113. In the map, each node represents a keyword; the larger the node circle or label font, the higher the frequency of that keyword, indicating a direct proportional relationship. The connections between nodes reflect co-occurrence relationships among different keywords. The top 10 keywords are shown in Table 1. High-frequency keywords reflect research hotspots in the field. Among the top 10 hotspot keywords, fostering virtue and cultivating talents, as the core node, appears most frequently, forming a closely connected network with keywords such as curriculum-based ideological and political education, new era, ideological and political theory courses, college students, paths, ideological and political education, three-whole education, and implementation paths. A keyword burst detection analysis was also conducted (Figure 3). The higher the burst strength, the more concentrated scholarly attention the keyword received during the corresponding period. Keywords such as educating students and ideological and political theory courses exhibit high burst strength, with their burst duration extending to 2025, indicating that these topics have remained frontier hotspots throughout the research period up to 2025.



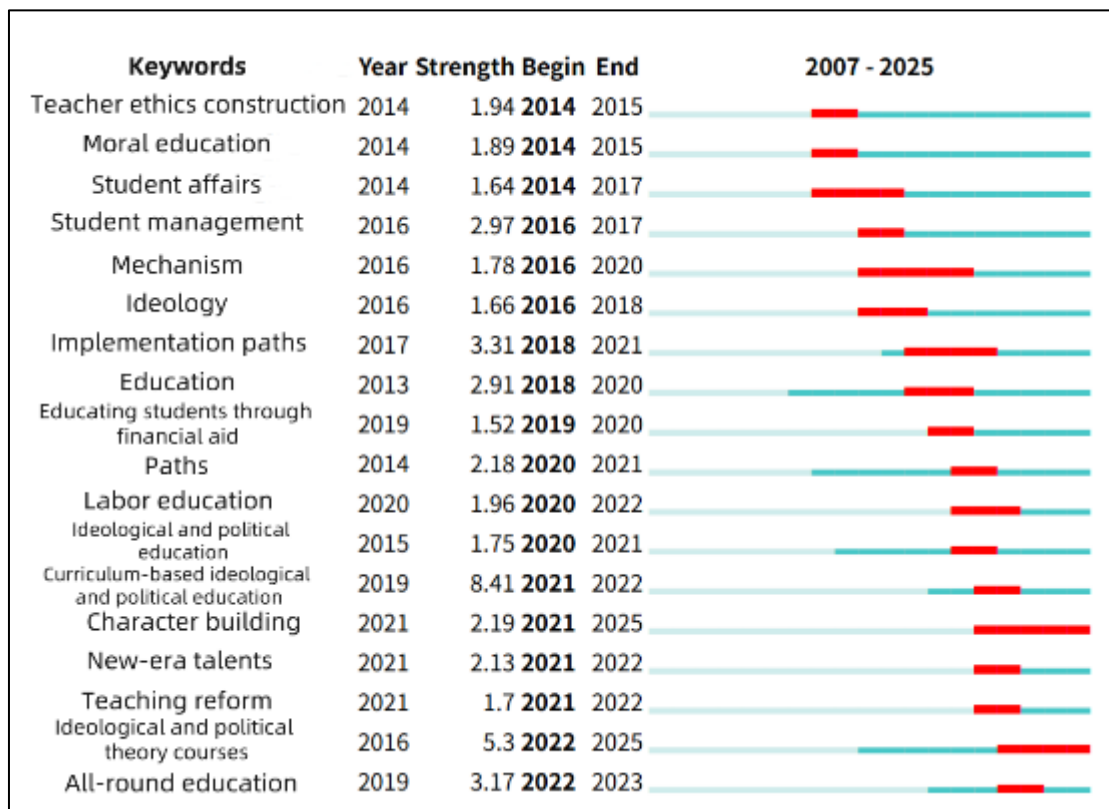
(Source: Created by the authors based on CiteSpace software.)

Figure 2 Keyword co-occurrence network map

Table 1 High-frequency keywords (top 10)

No.	Keyword	Frequency	Centrality
1	Fostering virtue and cultivating talents	883	0.89
2	Chinese higher education institutions	883	0.81
3	Curriculum-based ideological and political education	60	0.26
4	New era	55	0.41
5	Ideological and political theory courses	32	0.63
6	College students	26	0.04
7	Paths	25	0.79
8	Ideological and political education	24	0.07
9	All-round education	19	0.23
10	Implementation paths	18	0.10

(Source: Created by the authors based on CiteSpace software.)



(Source: Created by the authors based on CiteSpace software.)

Figure 3 Keyword burst detection analysis

An analysis of keyword distributions suggests several major thematic clusters in this field. The first theme concerns curriculum-based ideological and political education and teaching reform. Many studies explore the integration of ideological and political elements into various professional courses, including physical education, martial arts, English, accounting, and clinical medicine. For instance, Zhang Jun discusses strategies for integrating ideological and political education into university martial arts courses from the perspective of fostering virtue and cultivating talents in higher education institutions [2], while Xu Zizheng et al. examine how generative artificial intelligence may empower ideological and political leadership [3]. The second theme involves the integration of Party building with ideological and political education. A number of studies address the guiding role of Party building work in fostering virtue and

cultivating talents, as seen in Zhang Ying et al., who explore innovations in Party building education models for graduate students [4]. The third theme covers all-round education and collaborative mechanisms. Relevant literature frequently examines the pathways for achieving education by all staff, throughout the whole process, and in all aspects. An example is Wang Lihe et al., who analyze the practical challenges and possible solutions for implementing the fundamental task in higher education institutions during the new era [5]. The fourth theme focuses on cultural education and the use of red resources. Red culture, fine traditional Chinese culture, and university history have become important educational carriers. Yang Meishuang et al., for example, investigate the multidimensional pathways for integrating Cangzhou's red culture into university ideological and political education [6]. The fifth theme consists of practical educational activities in specific areas, such as mental health education, financial aid education, labor education, aesthetic education, and online education. Xu Linling et al., for instance, explore the mutually constructive logic behind integrating mental health education into the broader effort of fostering virtue and cultivating talents in higher education institutions [7].

It is worth noting that keywords such as "paths" appear relatively frequently, suggesting that much of the existing research is devoted to practical and operational questions concerning how to foster virtue and cultivate talents. In contrast, keyword nodes such as "evaluation", "effectiveness", and "empirical" are noticeably smaller in size, indicating that scientific assessment, quantitative testing, and evidence-based research on the actual outcomes of fostering virtue and cultivating talents remain relatively underdeveloped. This finding suggests that while current studies have accumulated considerable experience in addressing implementation strategies, further efforts are needed to evaluate educational outcomes and demonstrate effectiveness.

3.3. Cluster Analysis and Core Themes

Through keyword clustering analysis, research on fostering virtue and cultivating talents in Chinese higher education institutions can be grouped into the following three core themes.

The Connotation, Evolution, and Value Logic of Fostering Virtue and Cultivating Talents in the New Era
This cluster focuses on the dialectical relationship between fostering virtue and cultivating talents, the construction of the meaning of virtue, and the fundamental role of this task in the strategy of building a strong educational system. Scholars have drawn on multiple disciplinary perspectives to explain the theoretical foundations of fostering virtue and cultivating talents, and have paid increasing attention to its connections with political construction, talent cultivation, and long-term mechanisms. A common view in the literature is that fostering virtue serves as the premise and direction for cultivating talents, while cultivating talents is the ultimate goal and expression of fostering virtue. In the context of the new era, the meaning of this task has become more specific: in terms of political construction, it emphasises the fundamental stance of educating people for the Party and the state; in terms of talent cultivation, it aims to produce socialist builders and successors with well-rounded moral, intellectual, physical, aesthetic, and labour education; and in terms of long-term mechanisms, it seeks to move from short-term initiatives towards institutionalised and normalised operational systems. However, most of these studies are normative theoretical analyses, and empirical research based on large-scale surveys or historical comparisons remains relatively weak.

All-Round Education and Collaborative Mechanisms: The concept of all-round education—that is, education by everyone, throughout the whole process and in all aspects—represents a significant departure from previous models that relied on single subjects or single pathways. It advocates a new pattern of education that involves all participants, ensures continuity across the entire process, and achieves full coverage. This is not only an important innovation in educational methodology but also reflects a deeper understanding of the principles of education. High-frequency keywords in this cluster include collaborative education, counselors, Party building, and extracurricular activities. Research hotspots include: the role positioning and competence improvement of university counselors [8]; the integration and innovation of Party building with fostering virtue and cultivating talents; the construction of one-stop student communities on campus as a new educational platform [9,10]; and the integration of labour education, aesthetic education, and moral education under the five educations simultaneously framework. Nevertheless, existing studies tend to focus on specific local links or single agents, and lack systematic and in-depth investigation of the cross-departmental, cross-cycle, and cross-context operational mechanisms required for comprehensive all-round education reform.

Curriculum-Based Ideological and Political Education and the Reform of Ideological and Political Courses
The cluster focuses on how the fundamental task of fostering virtue and cultivating talents can be integrated into the main channel of classroom teaching. Keyword co-occurrence analysis places nodes such as curriculum-based ideological and political education, ideological and political courses, teaching reform, cultural education, and talent cultivation at the core of the network, indicating that curriculum-based education is one of the most structurally important topics in this field. The research shows a diverse range of pathways. First, the pathway of curriculum-based ideological and

political education, which emphasises integrating ideological and political elements into various professional courses (e.g., physical education, martial arts, English, accounting, clinical medicine) to achieve the unity of knowledge transmission and value guidance. Second, the reform of ideological and political courses, focusing on teaching innovation, optimisation of textbook systems, and faculty development in the new era. Third, cultural education pathways, drawing on the educational resources of fine traditional Chinese culture [11], red culture [12,13], and university history. Fourth, online education pathways, exploring the influence of digital-age cyberculture and generative artificial intelligence on university students' values and possible responses [3]. It is worth noting that although pathway research is abundant, most of it remains at the level of experience summarisation and model design. Comparative evaluation and evidence-based research on the actual educational outcomes of different pathways are still lacking, and there is also a shortage of integrated research frameworks based on systems thinking.

4. Conclusions and Prospects

4.1. Main Conclusions

The paper presents a visual analysis of 883 articles on fostering virtue and cultivating talents in Chinese higher education institutions. These articles were published between 2007 and 2025 and were retrieved from the CNKI database. CiteSpace software was used for the analysis. The analysis systematically reveals the current state and evolutionary characteristics of research in this field. The findings indicate that studies in this area have moved through a transition from conceptual interpretation to pathway exploration, and then to systemic deepening, forming several hotspot clusters, notably curriculum-based ideological and political education, all-round education, and collaborative mechanisms, as well as theoretical inquiries into the connotation and value logic of the fundamental task. However, existing research exhibits a certain structural imbalance. First, theoretical construction has been overemphasised while empirical support remains relatively weak; behind the rich body of theoretical discourse lies a clear lack of quantifiable and traceable evidence chains concerning actual educational effectiveness. Second, localised practices have received extensive attention, but systemic integration lags behind—topics such as curriculum-based ideological and political education and Party building work have been thoroughly studied, yet research on the holistic and normalised operational mechanisms of all-round education remains underdeveloped. Third, model design has flourished, but effectiveness evaluation has been largely neglected; although various innovative models continue to emerge, a scientific evaluation indicator system for assessing model effectiveness has yet to be established, and there is still no commonly accepted standard for what constitutes effective education.

4.2. Future Prospects

Based on the above findings, future research on fostering virtue and cultivating talents in Chinese higher education institutions may focus on breakthroughs in the following four areas.

First, a measurable and evaluable effectiveness assessment system should be developed. Current discussions on the effectiveness of this fundamental task remain largely theoretical, with few operational evaluation tools available. Wu Zhongquan has conducted theoretical explorations of evaluation mechanisms [14]. Future research could move towards the operationalisation and empirical testing of indicators. By drawing on international assessment frameworks and adapting them to the context of Chinese higher education, researchers may develop multidimensional tools covering cognitive, affective, and behavioural dimensions. Long-term longitudinal databases could also be established to provide empirical evidence for testing the long-term effects of educational policies.

Second, systematic research on the comprehensive reform of all-round education needs to be deepened. Future studies should shift from a point-like focus to a network-oriented approach, paying close attention to collaborative mechanisms among different departments (e.g., academic affairs, student affairs, logistics, Party building), pathways for breaking down information silos, and methods of resource integration. Case study could be employed to analyse typical models and key obstacles in promoting all-round education reforms across different types of institutions, thereby generating generalisable institutional experience.

Third, the role of empirical research in supporting theoretical innovation should be strengthened. Large-scale questionnaire surveys, quasi-experimental designs, and multi-level linear models may be used to test the marginal effects and moderating variables of different educational pathways. At the same time, qualitative methods such as grounded theory, narrative inquiry and phenomenology can help reveal the internal mechanisms underlying the process of fostering virtue and cultivating talents.

Fourth, digital technologies should be leveraged to transform educational models. In response to the national strategy for educational digitalisation, future research may explore the application of big data, artificial intelligence and learning analytics in this field. Possible directions include using generative artificial intelligence for personalised value guidance [3] and developing natural language processing-based systems to monitor university students' ideological dynamics. Chang Jiayi et al point out that technological innovation is an important driving force for the development of practical forms of fostering virtue and cultivating talents [15]. Further exploration is needed into the deep integration of artificial intelligence with educational scenarios. At the same time, careful attention should be paid to ethical risks such as privacy concerns, algorithmic bias, and value dilution, ensuring that technological applications always serve the fundamental purpose of educating students.

Overall, research on fostering virtue and cultivating talents in Chinese higher education institutions stands at a critical juncture, transitioning from scale expansion to quality improvement and from experience-driven to evidence-driven approaches. Collaborative efforts among academia, educational administrative departments, and frontline institutions are needed to build a more scientific, systematic, and effective research landscape.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

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