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New Productive Forces and Chinese College Students: A Bibliometric Analysis Based on CNKI

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Abstract

The concept of 'new productive forces', rooted in Marxist economic theory, has been developed in an innovative way within the Chinese context to emphasize the importance of high-quality, innovation-driven productivity as a driving force for China's modernization and sustainable development. Entering the new era, China has further proposed a new concept of integrated development of education, science and technology, and talent, closely integrating new productive forces with education. This study uses bibliometric analysis to examine 190 articles retrieved from the China National Knowledge Infrastructure (CNKI) database with the keywords 'new productive forces' and 'university students'. Using quantitative visualization techniques, the study identifies publication trends, dominant themes, influential authors and institutional contributions related to the evolving academic discourse on the relationship between emerging productive forces and the development of Chinese college students. The findings reveal that the rise of new productive forces creates new demands and opportunities for higher education in China, necessitating curricular reform, interdisciplinary integration and a focus on innovation and entrepreneurship education. Furthermore, these productive forces raise expectations regarding the competencies and qualities of university students, emphasizing critical thinking, creativity, adaptability and interdisciplinary skills. The study emphasizes the pivotal role of higher education in nurturing the high-quality talent needed to sustain China's new productive forces, providing valuable insights for educational policies and future research directions.

Keywords

Bibliometric Analysis, Chinese College Students, CNKI, New Productive Forces

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Introduction

The integrated development of education, science and technology, and talent is the theoretical support and institutional channel for promoting the formation of new productive forces and high-quality development, and a key lever for achieving the coordinated advancement of invigorating the nation through science and education and strengthening the nation through talent(Liang, 2024). The concept of 'new productive forces' originates from Marxist economic theory and was innovatively developed in the Chinese context by President Xi Jinping in 2023(Wang, 2024). Representing a leap in the level of productive forces, it is characterized by the combination of new qualities in laborers, materials, tools and production factors. This transformation is essential for achieving high-quality development and Chinese-style modernization (Li, 2024). These modern productive forces are mainly driven by technological innovation, particularly in artificial intelligence, robotics, data processing, new materials and energy sources. This shift moves away from reliance on traditional inputs such as land and low-cost labor(Fan, 2024). These new productive forces embody high technology, efficiency, and quality, contributing to the sustainable, innovation-driven economic development model that China requires at this stage of its evolution (XinhuaNews, 2024).

In China, the impact of new productive forces is profound. They underpin a strategic shift from extensive growth to high-quality development. They empower the upgrading of industrial chains, promote green and digital transformation, and enhance economic resilience amidst global uncertainties (XinhuaNews, 2024). Furthermore, they lay the material and technological groundwork for the country to lead in cutting-edge industries, enhance labor quality, and foster the innovation capacity that is essential for national competitiveness and modernization (Fan, 2024). The emergence of new productive forces creates new demands and opportunities for higher education institutions. Higher education plays a pivotal role in cultivating the innovative talent and high-level professionals required by this new productivity paradigm (Zhang, 2024). Key strategies for universities to meaningfully contribute to the development of new quality productive forces include digital technology empowerment, resource optimization, and reform of evaluation systems(Zhang, 2024) (Peng, 2024).Moreover, new productive forces of a higher quality impose greater expectations on the competencies and abilities of university students. As well as traditional academic knowledge, there is a growing emphasis on critical thinking, creativity, interdisciplinary skills and adaptability. (Zhang, 2024) (Zhang Xinxin, 2023).

This study employs a bibliometric analysis approach, retrieving 190 articles from the CNKI database using the keywords 'new productive forces' and 'university students'. These methods allow for a quantitative examination of publication trends, research themes and influential works, providing a comprehensive understanding of the academic discourse on this topic. Visualization techniques are used to identify research hotspots and development trajectories within the field (Shang & Gao, 2021) (Yan et al., 2022).This research aims to provide an overview of the evolving landscape of new productive forces in relation to Chinese university students, highlighting emerging trends, educational implications, and future research directions.

Methodology

Bibliometrics is used as primary methodological framework for this study. The present study employs the visualization analysis capabilities of the China National Knowledge Infrastructure (CNKI) to conduct a quantitative analysis of relevant literature. This approach assists in identifying trends within research domains, recognizing influential works and authors, and evaluating the overall progression and influence of scientific research. Bibliometric methods facilitate a systematic analysis of publication patterns, author collaborations, institutional distributions, and keyword co-occurrence networks to discern research trends and focal points (Shang & Gao, 2021). CNKI's visualization analysis capabilities provide quantitative tools, including "Metering Visualization Analysis" functions that examine quantity changes, keyword networks, research institutions, and hierarchical distributions(Wang et al., 2018).

Results and Discussion

The Annual Trend Analysis of Publication

This article retrieved 190 target papers from various journals through CNKI. The publication status of these 190 papers since the New Productive Forces concept was proposed is shown in Figure 1.

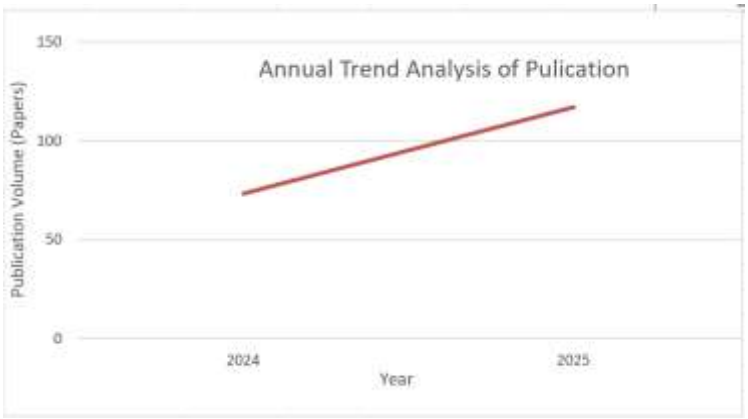

Figure 1: Annal Trend Analysis of Publication

From 2024 to 2025, the literature on new productive forces and Chinese university students shows a clear take-off: 73 articles appeared in 2024, signalling the topic's entry into academic discourse, followed by 117 articles in 2025, a 60 % jump that points to rapid maturation and rising urgency. This growth curve reflects researchers' initial mapping of the field in 2024 and their quick move toward deeper, more systematic inquiry in 2025, mirroring the accelerating influence of technological change on education and employment.

Given this momentum, future studies are likely to probe how artificial intelligence reshapes pedagogy, how the gig economy alters students' career paths, and which new skill sets are demanded by an evolving labour market. Policy analysis, educational reform scenarios, and longitudinal assessments of graduates' trajectories are also expected to expand, ensuring the topic remains a vibrant research frontier.

The Topic Distribution Analysis

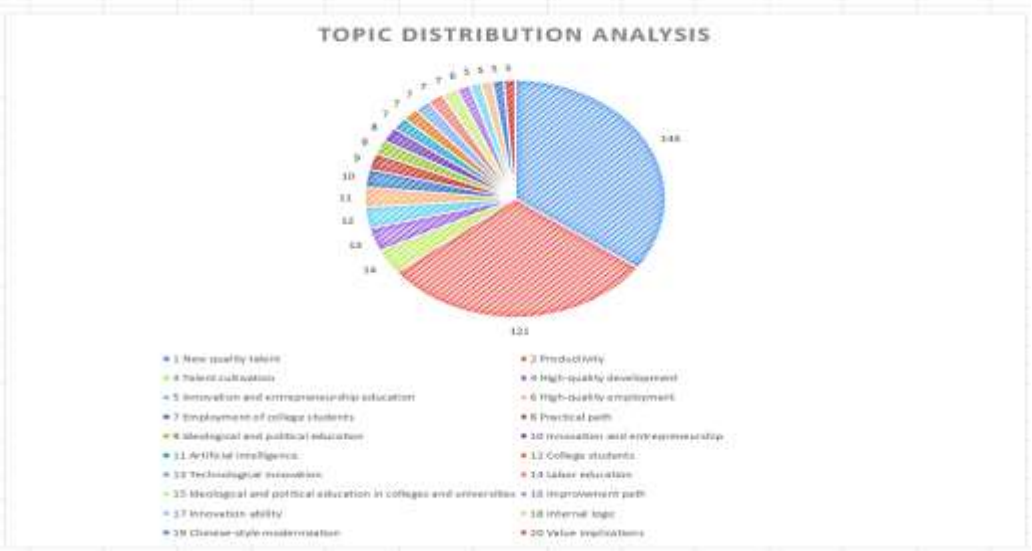

Figure 2: Topic Distribution Analysis

Figure 2 shows that the field clusters around two dominant themes—"New Quality Talent" (143 papers) and "Productivity" (121 papers)—signalling an overriding concern with identifying and nurturing the human capital and efficiency gains demanded by a fast-changing economy. Mid-range attention is paid to "Talent Cultivation" (14), "High-Quality Development" (13), "Innovation & Entrepreneurship Education" (12) and "High-Quality Employment" (11), while "College-student Employment" (10), "Practical Path" (9) and "Ideological & Political Education" (8) underscore persistent worries about graduate transitions and values formation.

Emerging niches—"Artificial Intelligence" and "Technological Innovation" (7 each)—together with smaller clusters on labour education, innovation ability and Chinese-style modernization (5 each), reveal the community's early efforts to embed AI and ideological goals within curricula. Overall, the map displays a future-oriented research agenda centred on talent-upgrading and productivity, yet still carving out space for deeper inquiry into technology integration, pedagogical innovation and the socio-political dimensions of graduate employability.

Analysis of Hierarchical Distribution

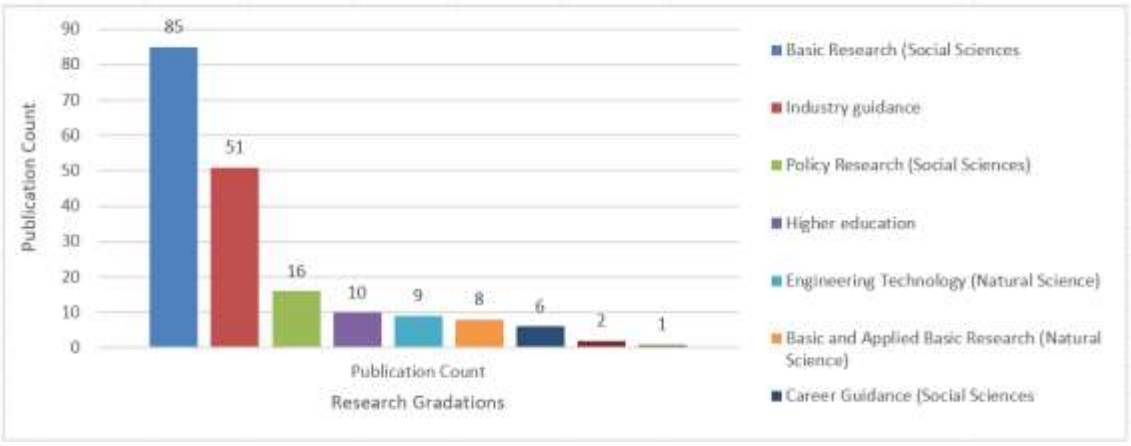

Figure3: Research Gradations

Figure 3 shows 282 papers distributed across research degrees: Basic Research (Social Sciences) leads with 85, followed by Industry Guidance (51), indicating the field is driven by foundational theory and immediately applicable solutions. Policy Research (Social Sciences) and Higher Education trail at 16 and 10, pointing to modest but visible concern for regulatory and pedagogical dimensions.

Thus the corpus is heavily skewed toward social-science theory and industry-oriented practice, foregrounding the interplay between conceptual groundwork and real-world implementation, while policy and education studies occupy a secondary, steadily growing tier.

Analysis of Author Distribution

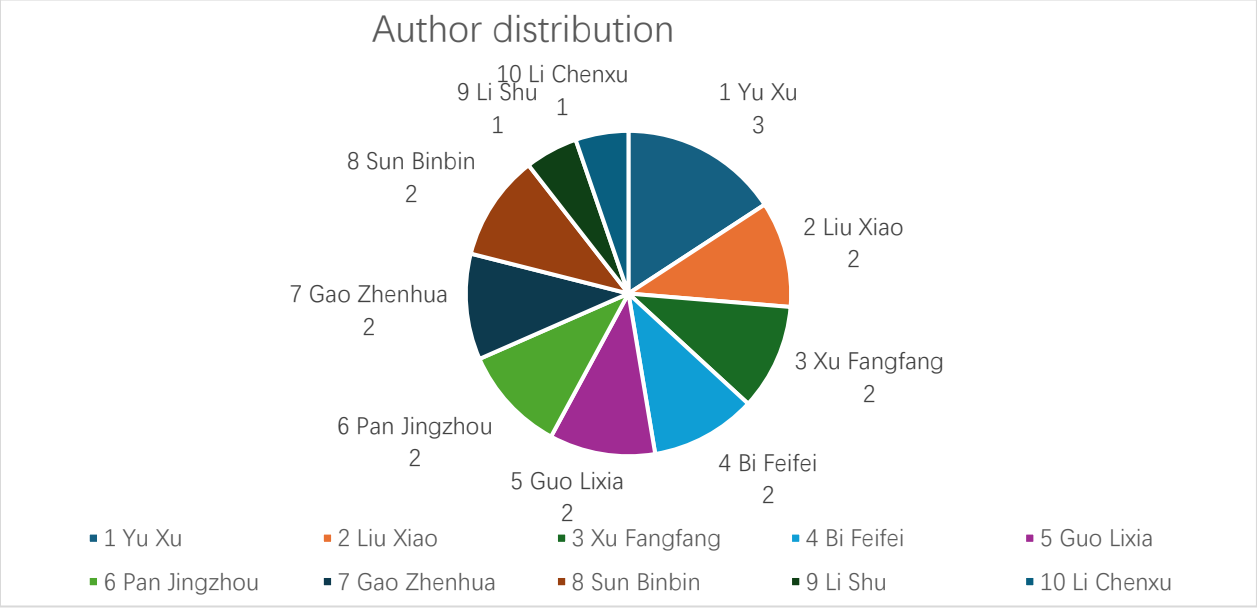

Figure 4: Author Distribution

The pie chart shows how publications are distributed among the authors of this study. The analysis reveals that Yu Xu is the most prolific author, having published three papers and thus making a significant contribution to the field. Liu Xiao, Xu Fangfang, Bi Feifei, Guo Lixia, Pan Jingzhou, Gao Zhenhua and Sun Binbin each have two publications, demonstrating substantial and consistent engagement in the research area. Li Shu and Li Chenxu have each contributed one publication, which, while less frequent, still represents a valuable addition to the body of work. Overall, the distribution suggests a collaborative research environment in which multiple authors are actively engaged in producing scholarly work, with a few leading contributors driving a significant proportion of the output.

In summary, the author distribution chart highlights the diversity of contributions, as well as identifying key contributors who are particularly active in the research domain. The balance between a few leading authors and several contributors with fewer publications could suggest a research community that is both focused and inclusive, encouraging a wide range of voices and perspectives.

Analysis of the Distribution of Publishing Institutions

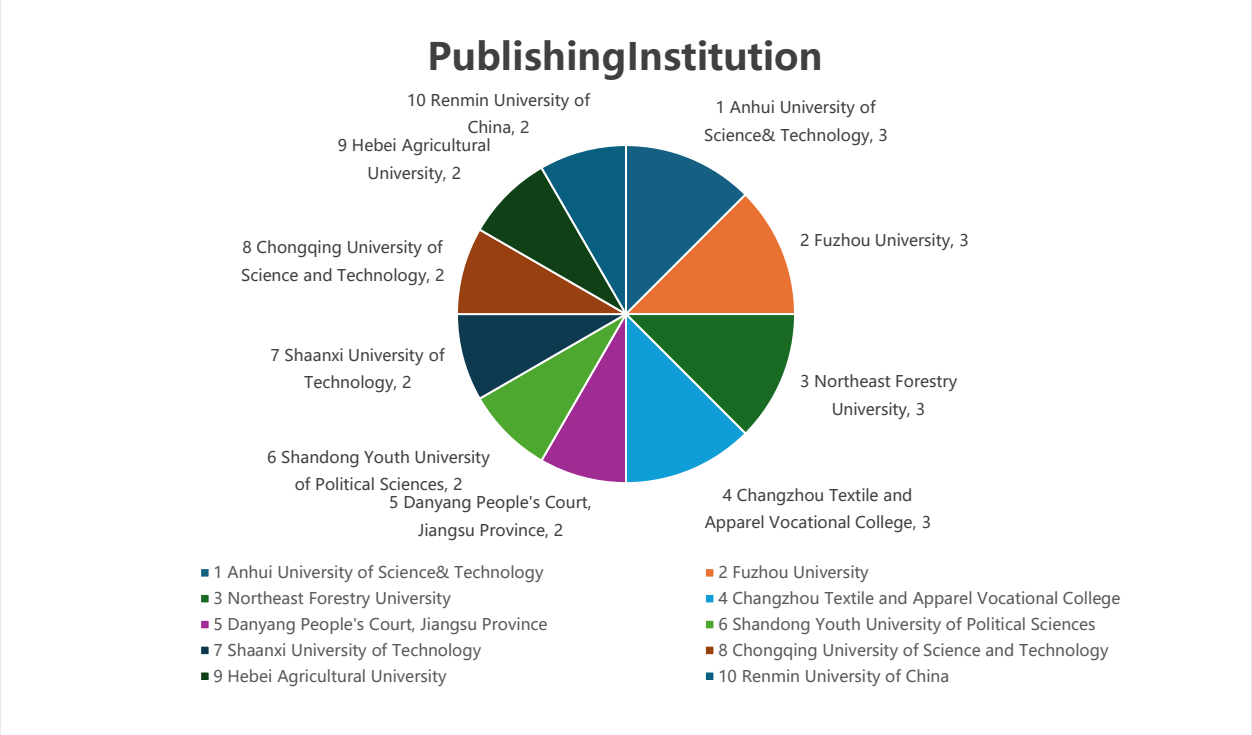

Figure 5: Publishing Institution

Figure5 provides a visual representation of the distribution of publications by institution related to research on the relationship between new productive forces and Chinese university students. Anhui University of Science and Technology has published three papers in this area, demonstrating a significant research output. Fuzhou University and Northeast Forestry University follow closely behind, with each institution contributing three publications, indicative of robust research capabilities in their respective domains.

It is evident that Changzhou Vocational College of Textiles and Garments, Shandong Youth University for Political Science, and Chongqing University of Science and Technology have each demonstrated consistent research activity by publishing two publications. Meanwhile, Shaanxi University of Science and Technology, Hebei Agricultural University, and Renmin University of China each published two publications, demonstrating active research participation. The chart reveals a diverse range of institutions contributing to this research area, with a small number of leading institutions accounting for a significant proportion of publications. This distribution underscores the collaborative and multi-institutional character of academic research and highlights the importance of institutional support and resources in fostering scholarly work.

Analysis of Fund Distribution

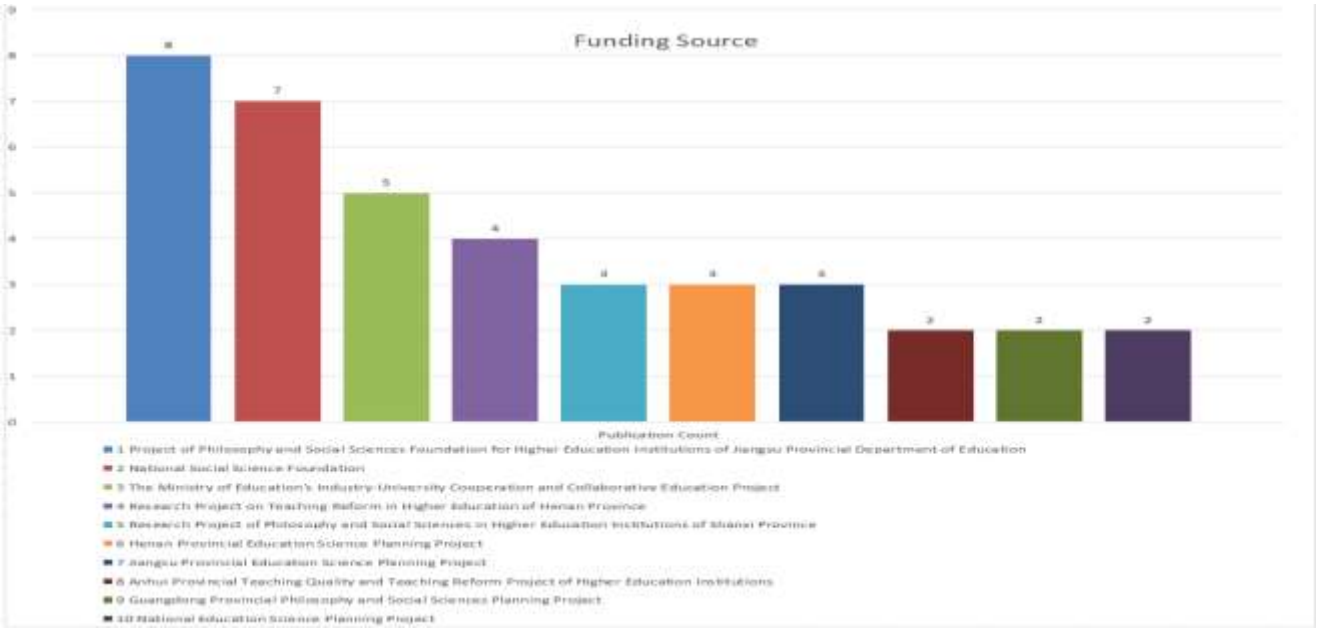

Figure 6: Funding Soure

Figure 6 ranks the ten most active funders: the Jiangsu Higher-ed Philosophy and Social Science Foundation leads with eight projects, followed by the National Social Science Foundation (seven), while the Ministry of Education's Industry–University Cooperation programme and Henan's Higher-ed Teaching Reform grant fund five and four respectively, underscoring heavy investment in social-science inquiry and pedagogic innovation.

The remaining provincial planners—Shanxi, Henan, Jiangsu, Anhui, Guangdong—and the National Education Science Planning Project each back $\leqslant 3$ initiatives, revealing a diversified but thematically coherent funding landscape that prioritizes collaborative education, curriculum reform and philosophy/social-science research across multiple administrative levels.

Analysis of Discipline Distribution

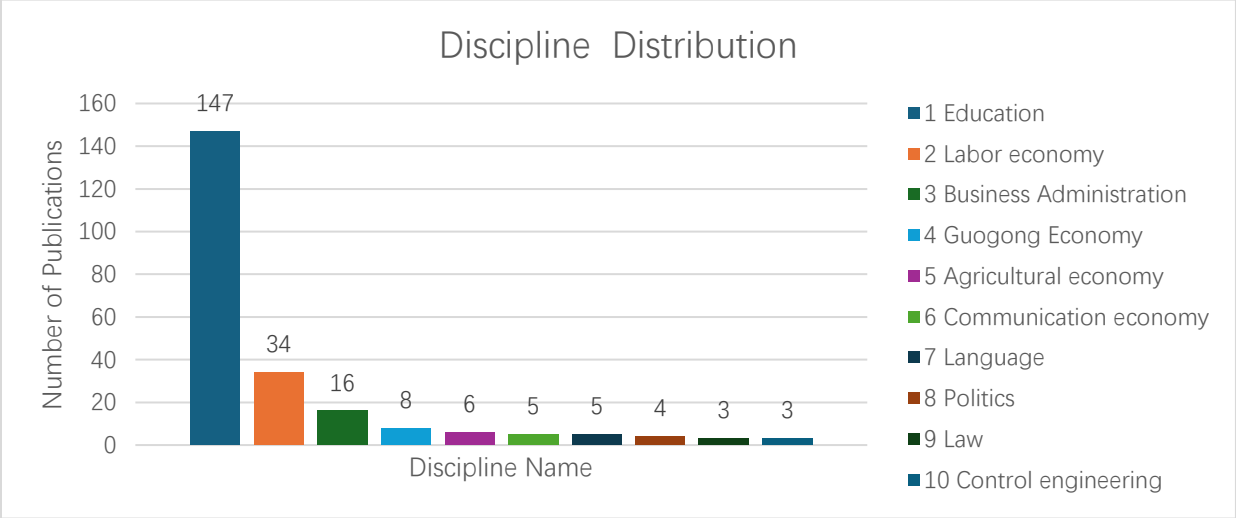

Figure 7: Discipline Distribution

Figure7 clearly shows the distribution of publications across different disciplines. With 147 publications, education leads by a significant margin, indicating a dominant focus on educational research within this study. This suggests that educational topics are of paramount importance in the current research landscape.Labor economics follows with 34 publications, demonstrating substantial interest in economic aspects related to labor. Business administration and guogong economy have 16 and eight publications respectively, highlighting moderate research activity in these areas. Agricultural Economy, Communication Economy and Language each have six, five and five publications respectively, indicating a niche but present interest in these disciplines. Politics and law have the fewest publications, with four and three respectively, suggesting that these areas are less prioritized in the current research context. Overall, the chart reveals a heavy emphasis on education and the labor economy, with other disciplines receiving varying degrees of attention. This distribution may reflect research priorities and funding allocations within the academic community.

Analysis of Literature Resources

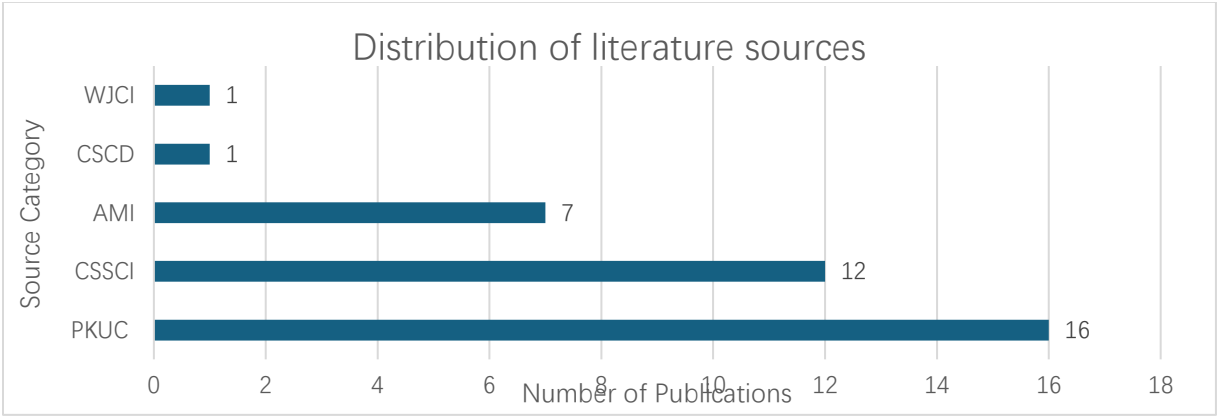

Figure 8: Distribution of Literature Sources

Figure8 shows how the literature sources used in the study are distributed. The majority of publications (16) are sourced from PKU, suggesting a strong reliance on this database for academic literature. CSSCI follows with 12 publications, suggesting that it is also a significant source of scholarly articles. AMI contributes seven publications, indicating moderate utilisation of this source.By contrast, CSCD and WJCI each have only one publication, implying that they are used less frequently in this research context. This distribution highlights a preference for certain databases over others, possibly due to their relevance, accessibility or scope. The heavy reliance on PKU and CSSCI suggests that these databases are particularly valuable for the research topics under investigation.

Analysis of Periodical Distribution

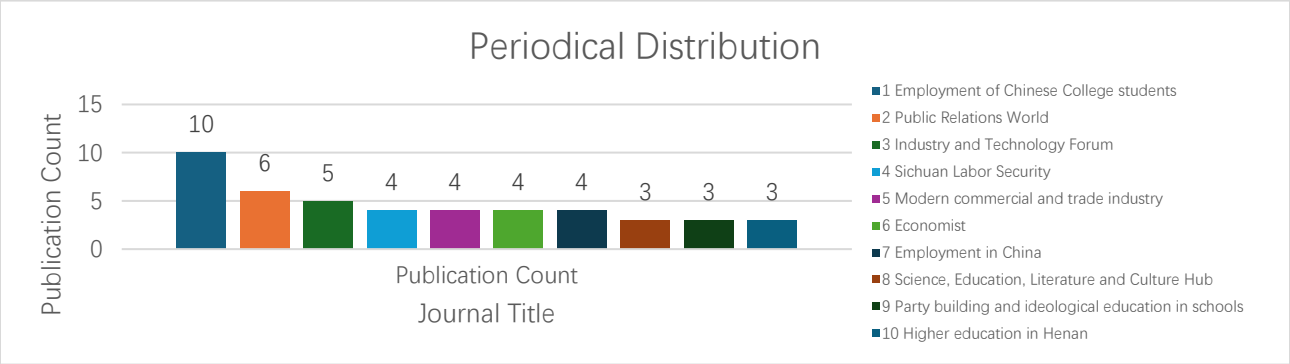

Figure 9: Periodical Distribution

Figure 9 shows that Employment of Chinese College Students leads with 10 papers, followed by Public Relations World (6) and Industry and Technology Forum (5), underscoring employment and PR as the journal landscape's twin anchors. Periodicals such as Sichuan Labor Security, Modern Commercial and Trade Industry, and Economist (4 each), along with niche titles like Employment in China and Party Building and Ideological Education in Schools (3 each), reveal a broad but employment-centered dissemination pattern across labor, commerce, economics and education disciplines.

Analysis of Key Words Distribution

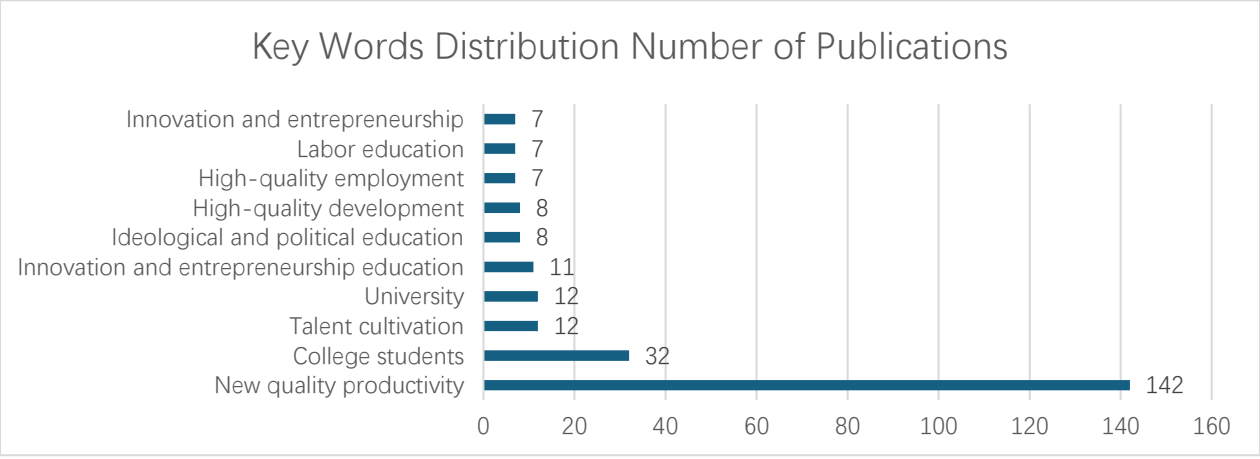

Figure 10: Key Words Distribution Number of Publications

Figure 10 shows that "New quality productivity" dominates with 142 hits, while "college students" ranks second (32), anchoring the discourse in how novel productive forces affect student development. Clustered around this dyad are "Talent cultivation" and "University" (12 each), "Innovation & entrepreneurship education" (11) and "Ideological & political education" (8), revealing a university-centered concern for nurturing employable, innovative graduates. Secondary foci—"High-quality development", "High-quality employment" and "Labor education" (7 each)—complete a keyword map that couples productivity gains with educational quality, signaling that future research will continue to interlink innovative pedagogy, graduate employability and the broader drive for high-calibre economic growth.

Analysis of Citation Status

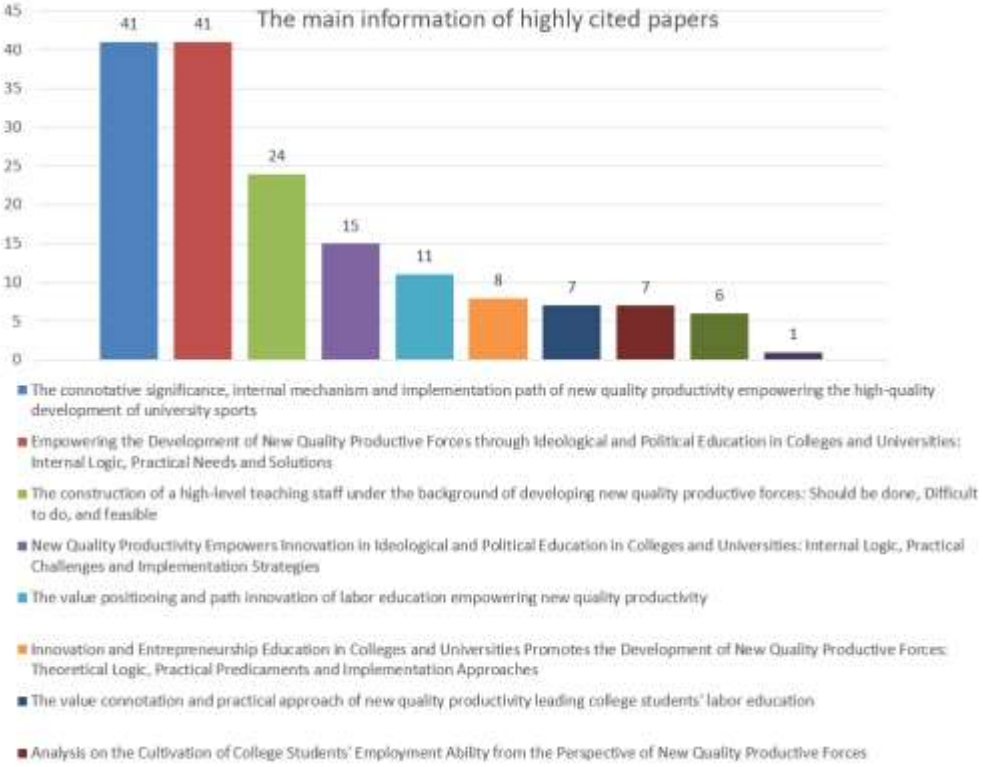

Figure 11: The Main Information of Highly Cited Papers

Figure11 presents the citation counts of the top 10 most cited papers within the study, indicating their influence and relevance in the field. Two papers have been identified as sharing the highest citation count of 41, with a focus on the connotative significance, internal mechanisms, and implementation paths of new quality productivity in empowering the high-quality development of university sports. Additionally, a paper with 24 citations explores the construction of a high-level teaching staff within the context of developing new quality productive forces, addressing the feasibility and challenges of such an endeavor. Another paper, cited 15 times, explores how new quality productivity can empower innovation in ideological and political education in colleges and universities, outlining internal logic, practical challenges, and implementation strategies. Papers with 11 and 8 citations respectively discuss the value positioning and path innovation of labor

education to empower new quality productivity, and the role of innovation and entrepreneurship education in promoting the development of new quality productive forces, including theoretical logic, practical predicaments, and approaches to implementation. The remaining papers, with a total of seven citations each, address the value, connotation and practical approach of new quality productivity in the labor education of leading college students. In addition, they analyze the cultivation of college students' employment ability from the perspective of new quality productive forces.In summary, the chart highlights a range of influential papers that are driving the discourse on new quality productivity, with a particular focus on education, labor, and the development of high-quality forces within universities. The high citation counts underscore the importance of these topics in current academic and practical discussions.

Analysis of Download Status

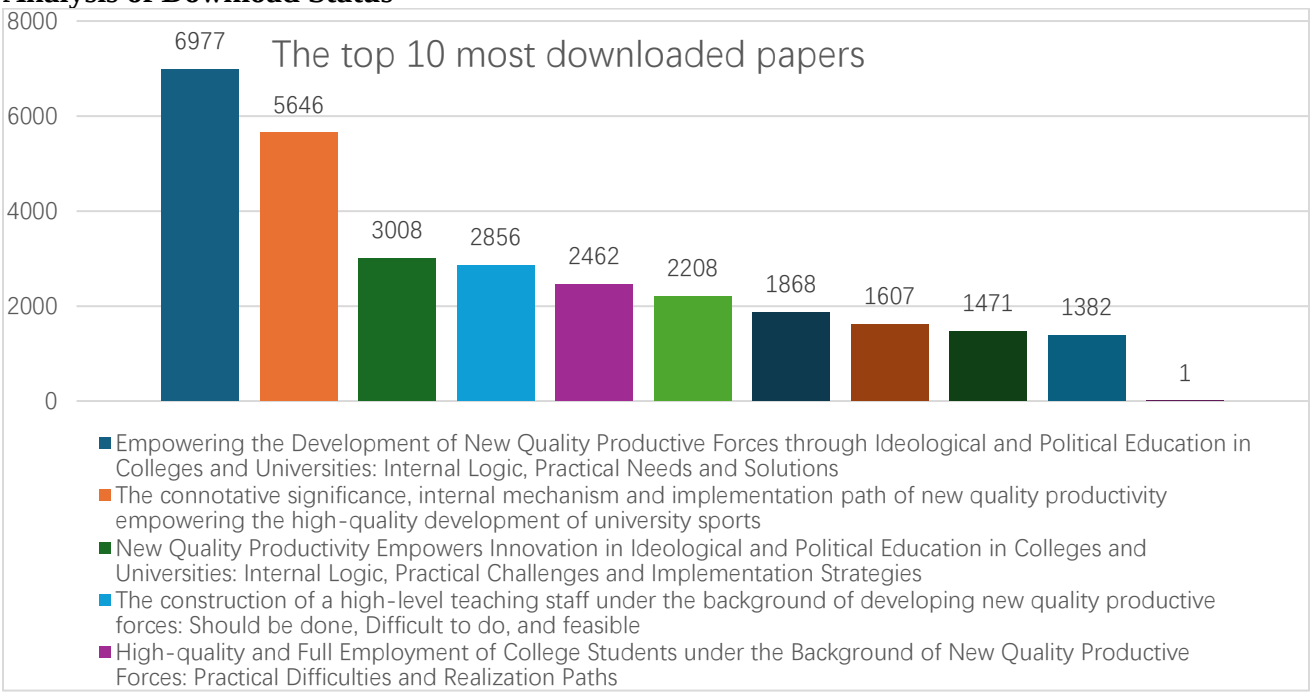

Figure 12: Statistics of the Top 10 Papers Downloaded

Figure12 shows that the most-downloaded papers cluster at the nexus of ideology, education and productivity, led by “Empowering New-Quality Productive Forces through University Ideological-Political Education”, while later hits examine sport and innovation, revealing a consensus that infusing curricula with ideological-political, physical and entrepreneurial components is seen as the holistic formula for equipping graduates to drive quality-centred economic renewal.

Conclusion

From the perspective of the integrated development of education, science and technology, and talent, this bibliometric review shows that since 2024, the "new quality productivity" driven by technological innovation has promoted the vigorous development of academic research in areas such as talent cultivation, innovation/entrepreneurship education, and graduate employability. This concept has prompted universities to redesign interdisciplinary, creativity-oriented curriculum systems, while requiring students to master critical thinking and adaptability, thus positioning higher education as a key link connecting human capital development with China's high-quality growth strategy.

Acknowledgements

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