Analysis on the Research Hotspots and Trends of International Artificial Intelligence Education: Based on Cite Space Visualization Research

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Abstract. With the rapid development of artificial intelligence (AI) technology, its integration with education has become a global research focus, profoundly reshaping educational ecosystems. From the perspective of health psychology, this study aims to explore the hotspots, evolutionary trends, and research gaps of international AI education, providing theoretical references and practical insights for optimizing China's AI education model. Using CiteSpace 6.1.R6 software, 6,049 related papers published in the Web of Science (WOS) Core Collection from 2013 to 2023 were subjected to bibliometric and visualization analysis. The results show that current international AI education research focuses on four core themes: AI & Deep Learning, AI & Virtual Reality (VR), AI & Lifelong Learning, and AI & Social Impact, covering multiple fields such as education, healthcare, and psychology. However, with the deepening of technology integration, challenges including improving educational efficiency and quality, promoting educational equity, strengthening ethical governance, and cultivating AI-literate talents have become increasingly prominent. This study clarifies the global research status and development trends of AI education, helps China absorb advanced international experience, promotes the internationalization of domestic AI education research, provides decision-making support for educational digital transformation, and accelerates the high-quality development of AI education in China. The application of CiteSpace in international AI education research is of great significance for grasping the field's dynamics and providing targeted references for China's practice.

Keywords: Artificial intelligence education; AI technology; Cite Space; Visualization Research.

1 Introduction

In the context of the global digital intelligence revolution, artificial intelligence (AI) has gradually transcended its instrumental attribute and developed into a core driving force for educational digital transformation, playing a pivotal role in promoting the construction of an education-powered nation [1,2]. From generative AI empowering ideological and political education to intelligent systems reconstructing educational

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evaluation mechanisms, AI is comprehensively reshaping teaching models, educational governance logic, and the overall ecology of educational development. The depth and breadth of AI's integration with education have become important indicators to measure a country's educational modernization level [3,4]. Against this backdrop, countries around the world have incorporated AI education into national strategic layouts, forming distinctive development paradigms through policy guidance, curriculum system construction, and resource investment.

Internationally, AI education research and practice present a diversified development pattern centered on "technology application + literacy cultivation" and supported by policy and ethics. The United States focuses on K-12 AI education, constructing a two-dimensional literacy curriculum system integrating "technology application capabilities + digital ethical literacy" [5]; the European Union has established a sound AI education framework covering ethical norms, data governance, and interdisciplinary integration through legislative and regulatory means [6]; Finland and the United Kingdom promote the systematic integration of AI across all educational stages by promoting digital transformation strategies, emphasizing the cultivation of students' innovative thinking and practical abilities [7,8]. These advanced practices fully demonstrate that AI education has become a key field of global educational competition, and its development level is closely related to national educational competitiveness.

China attaches great importance to the strategic value of AI education. The Development Plan for New-Generation Artificial Intelligence (2017) and the Outline for Building an Education-Powered Nation (2024-2035) have clearly put forward requirements for deepening the integration of AI and education, popularizing AI knowledge, and cultivating AI-related talents. Guided by these policies, China has made phased progress in the educational application of generative AI, the cultivation of teachers' AI literacy, the development of K-12 AI courses, and the intelligent transformation of ideological and political education [9-11]. However, in the process of development, China still faces multiple dilemmas: the AI education curriculum system is fragmented and outdated, failing to meet the needs of technological development; teachers' AI application capabilities are insufficient, and the training mechanism is not perfect; the digital divide between urban and rural areas and regions is prominent, hindering the balanced development of AI education; ethical risks such as data privacy and academic integrity are prominent, and the governance system is not yet sound; the cooperation between industry, university and research is insufficient, leading to the disconnection between AI technology and educational practice [12-14].

Existing academic research on AI education mainly involves five core dimensions: the educational application of generative AI, teachers' AI literacy cultivation, AI curriculum construction, AI educational ethical governance, and intelligent educational administration [15]. However, through a systematic review of existing studies, it is found that there are obvious shortcomings that need to be addressed urgently: First, the research perspective is fragmented, and most studies focus on single-scenario exploration (such as AI-empowered ideological and political education, foreign language teaching, or medical education) [16], lacking a holistic grasp of the global AI education research landscape and evolutionary laws, and failing to systematically sort

out the cross-regional, cross-institutional and cross-thematic research characteristics of the field. Second, the research content is unbalanced, focusing on the exploration of technological application paths, while ignoring the systematic research on key issues such as policy coordination, resource allocation, international cooperation mechanisms, and educational equity in the development of AI education. Third, the cross-border comparative research is superficial, mostly staying at the level of introducing foreign experience, lacking in-depth exploration of the adaptation logic between foreign advanced models and China's national conditions, and it is difficult to provide targeted and operable references for China's AI education practice. Fourth, the research method is relatively single, and most studies adopt qualitative analysis or single-case research, lacking systematic bibliometric analysis and visualization research on the global research frontier, making it difficult to accurately grasp the hotspots and development trends of the field.

Amid China's critical educational digital transformation, the 2024-2035 education plan mandates AI-education integration. This study uses bibliometrics/visualization (2013-2023 global data) to clarify AI education's status, hotspots and gaps, filling synthesis research voids for China's high-quality AI education.

Its contributions: 1) Systematize the decade's global research; 2) Reveal international cooperation/China's position; 3) Build a research framework; 4) Offer targeted suggestions for China's educational transformation.

To facilitate readers' understanding of the research logic, this study constructs a clear research framework, as shown in Figure 1. The framework is divided into four core links, forming a complete research chain from data collection to conclusion application:

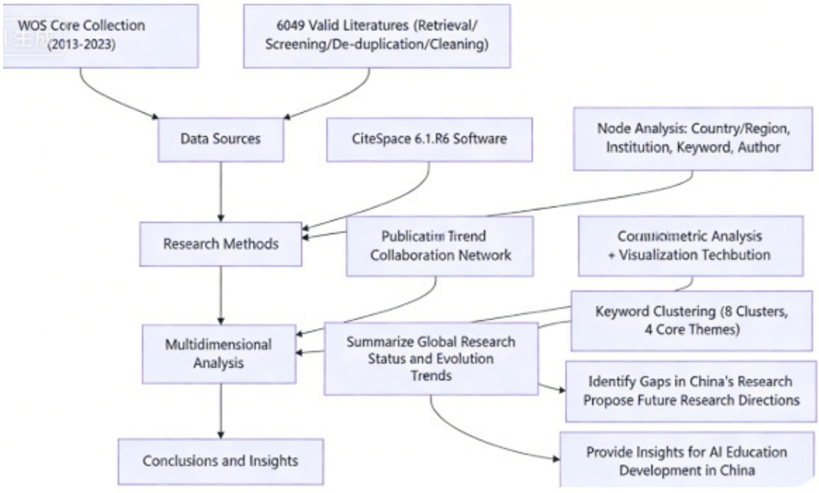

Fig. 1. Research Framework of This Study

(Note: ① Data Source: WOS Core Collection (2013-2023), with 6,049 valid documents obtained after retrieval, screening, deduplication and cleaning; ② Research Method: CiteSpace 6.1.R6, mainly using bibliometric analysis and visualiza-

tion technology, focusing on the analysis of nodes such as countries/regions, institutions, keywords and authors; ③ Multi-dimensional Analysis: Focus on five dimensions, including publication volume trend, country/region cooperation network, core institution distribution, keyword clustering (8 clusters, 4 core themes) and timeline evolution (3 stages); ④ Conclusion & Implications: Summarize the global research status and evolutionary trends of AI education, clarify China's research gaps, propose future research directions, and put forward targeted implications for China's AI education development.)

Compared with existing related studies, this study has obvious advantages and distinctive features, mainly reflected in three aspects: First, the data source is authoritative and the time span is comprehensive. The study selects the WOS Core Collection, which covers the top international academic journals, ensuring the representativeness and authority of the research samples; the 10-year research period (2013-2023) fully covers the early development, rapid growth and in-depth expansion stages of AI education, enabling a complete grasp of the field's evolutionary laws and development trends. Second, the research perspective is multi-dimensional and the research method is systematic. The study integrates bibliometric analysis and visualization technology, breaks through the one-sidedness of single-dimensional research, and realizes the comprehensive exploration of AI education research from the macro level (country/region cooperation), meso level (core institution distribution) and micro level (keyword theme evolution), providing a more comprehensive and in-depth understanding of the field. Third, the research implications are targeted and practical. The study focuses on the connection between international research and China's practice, not only clarifying the global research trends but also deeply analyzing China's gaps in publication quality, international cooperation and frontier theme research, and puts forward operable optimization suggestions, which has stronger practical guiding significance compared with existing pure theoretical research or superficial comparative research.

2 Methods

To comprehensively, systematically and scientifically grasp the global status, hotspots and development trends of AI education research, this study selects literature on the topic from the Web of Science (WOS) Core Collection covering 2013–2023. Retrieval was performed using the terms "artificial intelligence education" or "AI education". Given the short research history of AI and AI education, most relevant literature has emerged in the past decade, justifying the chosen timeframe. After sorting, cleaning and removing duplicates, 6,049 valid documents were finally obtained from foreign WOS core journals. This paper adopts the CiteSpace 6.1.R6 visualization tool for literature analysis. By adjusting software parameters and generating visual maps, it examines node information including authors, institutions and keywords of the included literature, thereby clarifying the research progress, hotspots and frontiers of global AI education research.

3 Results

3.1 Publication Volume

Research on artificial intelligence education and the publication of related literature in the world's WOS core journals can not only actively drive the progress of artificial intelligence research within the academic community but also effectively facilitate the application and development of artificial intelligence in the educational domain. Among these, the volume of publications serves as a crucial indicator for assessing whether a particular research field is being emphasized and advancing. It plays a significant role in dissecting the research landscape and trends within that field.By employing CiteSpace6.1.R6 to conduct statistical analysis and processing of the research literature on artificial intelligence education in the Web Of Science core journals,

It can be observed that the research on artificial intelligence education at home and abroad started relatively late but has developed rapidly. In the core literature of Web of Science, the earliest research on artificial intelligence education was a book review titled "COLLECTIVE EDUCATION IN KIBBUTZ - RABIN, AI AND HAZAN, B" published by scholar Fox, S.J from the University of Leicester College of Arts Humanities and Law (Leicester University), UK in the Annals of the American Academy of Political and Social Sciences. At present, the main countries publishing research on artificial intelligence education in WOS literature include the United States, China, the United Kingdom, Germany, Spain, India, Australia, and Canada. Among them, China and the United States are the major countries in terms of research publications. The United States has a higher number of publications than China, and its research trend shows a relatively stable annual increase. In comparison, China's growth in publications is relatively slow. However, in 2022, there was a sharp increase in the number of publications, reaching 555, which accounted for 41.6% of China's total publications on artificial intelligence education research in WOS journals over the past decade. Subsequently, it decreased rapidly.

3.2 Country/Region Analysis

CiteSpace 6.1.R2 was employed for country/region visualization analysis, generating a network graph (Figure 2) with 138 nodes, 1,284 links, and a network density of 0.1358. This indicates close inter-regional collaboration in AI education research: the 138 nodes represent participating countries, with node size corresponding to publication volume. China and the U.S. together contribute 48.1% of total publications, ranking as the field’s leading contributors—the U.S. tops with 1,555 articles (25.7%), followed by China with 1,333 (22.4%). Linkages denote inter-country cooperation, while node color reflects temporal trends (cool blue for early periods, warm red for recent years), revealing a global research boom concentrated in Western developed nations and emerging economies like China and India.

Fig. 2. Main countries/regions of publication from 2013 to 2023

Betweenness centrality quantifies node importance, with purple-circled nodes indicating values ≥1. As shown in Table 1 and Figure 1, despite China's second-highest publication output, its centrality (0.03) lags far behind the U.K. (0.16), Australia (0.14), Spain (0.12), the U.S. (0.08), and France (0.08). This signals insufficient international collaboration for China, highlighting an urgent need to strengthen partnerships, especially with European and American counterparts.

Table 1. Comparison of Keyword Networks in Relevant

Ranking	Country	Betweenness Centrality	Ranking	Country	Betweenness Centrality
1	USA	0.08	11	ITALY	0.03
2	PEOPLES R CHINA	0.03	12	SOUTH KOREA	0.01
3	ENGLAND	0.16	13	RUSSIA	0.06
4	GERMANY	0.03	14	BRAZIL	0.04
5	SPAIN	0.12	15	FRANCE	0.08
6	INDIA	0.09	16	JAPAN	0.01
7	AUSTRALIA	0.14	17	TURKEY	0.02
8	CANADA	0.02	18	NETHERLANDS	0.03
9	SAUDI ARABIA	0.02	19	SWEDEN	0.03
10	TAIWAN	0.01	20	ROMANIA	0.03

3.3 Core Institutions

Publication Volume.

CiteSpace was employed to analyze relevant publications in CNKI and WOS Core Journals, extracting the publication frequency, first publication year, and centrality of domestic and foreign research institutions. The top 20 institutions were selected for comparison, with detailed information presented in Table 2 and Figure 3.

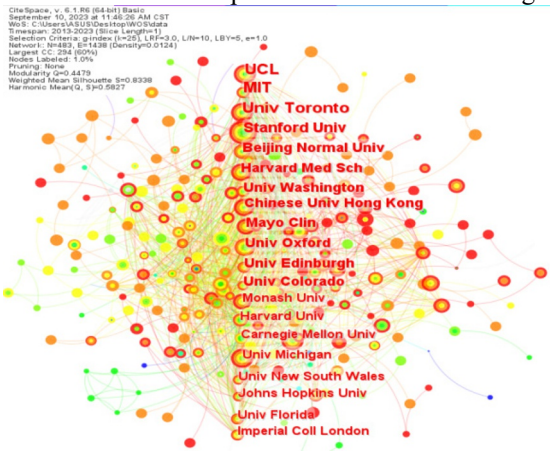

Fig. 3. Major Institutions Publishing on Artificial Intelligence Education in WOS Core Journals from 2013 to 2023.

Table 2. Comparison Chart of Institutional Networks on Artificial Intelligence Education in WOS Core Journals.

Rank-ing	coun t	Cen-traly	year s	institu-tions	Rank-ing	coun t	Cen-traly	year s	institu-tions
1	61	0.09	201 7	UCL	6	42	0.04	201 8	Harvard Med Sch
2	58	0.05	201 7	MIT	7	41	0.03	201 3	Univ Washing-ton
3	56	0.04	201 3	Univ Toronto	8	38	0.02	201 9	Chinese Univ Hong Kong
4	45	0.04	201 9	Stanford Univ	9	38	0.01	202 0	Mayo Clin
5	42	0.05	201 7	Beijing Normal Univ	10	37	0.02	201 9	Univ Oxford

As indicated in Figure 3 and Table 2:

the institutional network comprises 483 nodes (institutions), 1428 links, and a density of 0.0124. This indicates 483 institutions have published on AI education in the

WOS Core Collection, with moderate inter-institutional connections but low density—no global core research team has been formed, calling for enhanced cooperation. Top-publishing institutions are mainly elite universities in the U.S. and the U.K., such as UCL (61 papers, centrality=0.09), MIT (58 papers, centrality=0.05), and the University of Toronto (56 papers, centrality=0.04). While China's total publication volume is comparable to that of the U.S., it has fewer participating institutions with lower centrality—only Beijing Normal University (42 papers, centrality=0.05) and the Chinese University of Hong Kong (38 papers, centrality=0.02) rank among the top 10. Evidently, China needs to strengthen the research capacity and achievements of its institutions, intensify cooperation with globally renowned universities and research institutions, exchange cutting-edge theories, and promote the progress of AI education research.

Keyword Clustering Analysis.

To delineate AI education research directions in the WOS Core Collection, keyword clustering analysis was performed with "Keyword" as the node (burstness γ=1.0), selecting the top 8 clusters. Using the LSI algorithm, the clustering achieved Q=0.3861 and an average silhouette index S=0.6728 (Q>0.3, S>0.6), verifying credible results (see Figure 4).

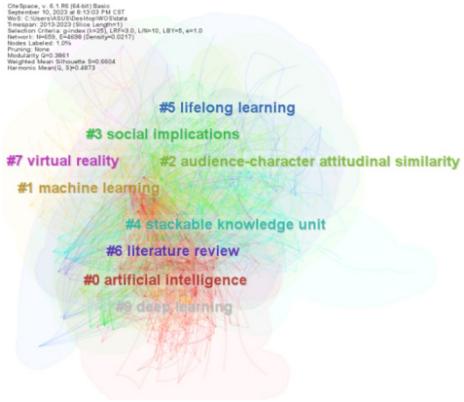

Fig. 4. Keyword Clustering

These 8 clusters (2013–2023) varied in size, silhouette value, average year, and core keywords: the largest Artificial Intelligence covered machine learning and deep learning; Audience Role Attitude Similarity focused on media psychology and STEM education; Social Influence included explainable AI and learning analytics; Stackable Knowledge Units emphasized digital badges and educational reform; Lifelong Learning addressed critical thinking and teacher intervention; Literature Reviewcentered on research trends and systematic reviews; Virtual Reality involved augmented reality and medical education; the smallest Deep Learning covered Google Bard and manuscript writing.

Figure 3 presents the keyword cluster map of AI education research, from which four core themes emerged: (1) AI and Deep Learning: Key studies included DAS data

analysis, radiology deep learning , explainable AI algorithms, medical imaging AI, deep learning modeling, public-friendly concept explanation, children's mental health, and VFG image segmentation, with leading scholars Naugler, Sejnowski, Carin, and Gupta. (2) AI and VR: Bostrom explored superintelligence, while Engelhardt mapped AI/VR applications in medicine and education, revealing broad interdisciplinary prospects. (3) AI and Lifelong Learning: Research focused on practical applications (child health, medical diagnosis, customer service), including conceptual frameworks, AI-driven lifelong education，and sitting posture monitoring, highlighting AI's dual impacts on educational quality and inequality. (4) AI and Social Impact: Bostrom underscored superintelligence risks; Han et al. analyzed socioeconomic effects; Al-Ghamdi examined AI's social media influence via critical analysis.

3.4 Keyword clustering timeline (timeline)

The timeline function in CitSpace can intuitively reflect the annual hotwords of artificial intelligence (AI) education research in the Web of Science (WOS) Core Collection globally. It also helps sort out and analyze the research status, thereby effectively predicting the future development and research trends of AI education (see Figure 5).

Fig. 5. Timeline of keywords related to AI research in the Web of Science

From the atlas, during the period from 2013 to 2023, the development of artificial intelligence technology in education has been very rapid and covers a relatively wide range. The research hotspots and theme changes of artificial intelligence education in the core collection of WOS abroad in the past decade can be mainly divided into the following three stages.

As shown in the map, AI technology has developed rapidly in education with a wide coverage from 2013 to 2023. The research hotspots and thematic changes of international AI education in the WOS Core Collection over the past decade can be divided into three main stages.2013–2015 (Early Development Stage): Focus was placed on artificial neural networks, machine learning, computer-aided instruction, artificial psychology, advanced military technology, educational data mining, STEM education, online education, intelligent tutoring systems, affective computing, interac-

tive learning environments, adaptive system modeling, big data learning analytics, fuzzy cognitive maps, online video games, and adaptive learning systems. This stage highlighted the broad application prospects and limitations of AI technology, as well as societal expectations and needs in the early research phase. 2016–2019 (Rapid Development Stage): Research gradually shifted to virtual reality, computational modeling, lightweight 3D models, question set programming, embedded systems, deep learning, medical education, blended learning, distance learning, natural language processing, emotion recognition, digital transformation, convolutional neural networks, simulation technology, mixed reality, meta-analysis, and tutoring systems. These advancements reflected the in-depth application and further expansion of AI technology in education. 2020–Present (In-depth Expansion Stage): Core research directions include systematic evaluation, self-efficacy, AI literacy, intellectual disability, mental health, big data, literature reviews, data models, knowledge graphs, digital ecosystems, face recognition, text mining, image processing, human-centered AI, social robots, virtual learning environments, academic integrity, reliability, AI ethics, edge computing, virtual assistants, fake news, and data privacy. Explorations in these areas indicate the increasingly in-depth application of AI in education, as well as growing societal demand and concern for AI education practices.

4 Conclusion

4.1 Research Findings Summary

In terms of publication volume and academic influence: International AI education research started late but developed rapidly, showing a "stable growth + periodic surge" trend. China ranks second in the world in terms of publication volume (1333 papers, 22.4%), second only to the United States (1555 papers, 25.7%), and achieved a peak of 555 papers in 2022. However, China's academic influence lags significantly—citation frequency, h-index, and average citations per paper are far lower than those of the United States, the United Kingdom, Australia and other developed countries, and even lag behind developing countries such as India and Saudi Arabia. This reflects that China's AI education research has the characteristics of "high output but low quality, wide coverage but insufficient depth", and there is an urgent need to improve the academic quality of research results. In terms of country/region and institutional collaboration: The global AI education research network has a high density (0.1358), indicating close inter-regional cooperation, but the cooperation is mainly concentrated among European and American developed countries. China's betweenness centrality (0.03) is much lower than that of the United Kingdom (0.16), Australia (0.14) and other countries, and the international cooperation is insufficient. In terms of core institutions, top publishing institutions are dominated by elite universities in the United States and the United Kingdom (UCL, MIT, University of Toronto, etc.). Only two institutions in China (Beijing Normal University and the Chinese University of Hong Kong) are among the top 10, with low centrality, indicating that China's research institutions lack core influence in the global network and need to strengthen international cooperation with well-known institutions. In terms of research hotspots and evolutionary trends:

Keyword clustering analysis identifies 8 core clusters and 4 core research themes (AI and Deep Learning, AI and VR, AI and Lifelong Learning, AI and Social Impact). The 10-year evolutionary process can be divided into three stages: 2013-2015 (Early Development Stage) focused on basic technologies such as machine learning and intelligent tutoring systems; 2016-2019 (Rapid Development Stage) shifted to in-depth applications such as virtual reality and deep learning; 2020-present (In-depth Expansion Stage) emphasizes ethical governance, mental health, digital ecosystems and other frontier directions. This evolution reflects the transformation of AI education research from "technology-driven" to "human-centered" and from "single application" to "systematic integration".

4.2 Research Gaps and Implications

Combined with the research findings, China's AI education research and practice face three key gaps: First, the quality of research results needs to be improved, and the academic influence is insufficient, which is not matched with the high output of publications; second, the depth of international cooperation is insufficient, the cooperation network is narrow, and it is difficult to integrate into the global research mainstream; third, the research on frontier themes such as AI ethics and human-centered AI is relatively lagging behind, and the connection between research and practical needs needs to be strengthened.

To this end, this study puts forward the following implications for China's AI education development: First, focus on improving the quality of research, strengthen in-depth exploration of core themes such as AI and educational equity, AI ethics, and interdisciplinary integration, and enhance the academic influence of research results; second, expand international cooperation channels, establish long-term cooperative relations with core institutions such as UCL and MIT, carry out joint research on frontier topics, and promote the internationalization of research results; third, align with global research trends, strengthen research on emerging directions such as AI literacy, digital ecosystems, and educational data privacy, and provide theoretical support for China's educational digital transformation and education-powered nation construction.

4.3 Future Research Directions

Future international AI education research will focus on three core directions: First, human-machine hybrid intelligence, which integrates human cognitive models and AI technology to build an intelligent educational system that adapts to individual learning needs; second, autonomous intelligent systems, reducing human intervention, improving the independent learning and adaptive capabilities of educational intelligent systems, and promoting the transformation of educational governance models; third, interdisciplinary integration, strengthening the cross integration of AI with brain science, psychology, education, and other disciplines, and exploring new paths for AI education application. For China, future research should focus on three key areas: First, localized adaptation research of international advanced experience, combining China's educational system and cultural characteristics to explore the adaptive path of AI

education models in China; second, research on the balanced development of AI education, focusing on solving the digital divide between urban and rural areas and regional differences, and promoting the equitable development of AI education; third, research on the construction of AI education evaluation system, establishing a multi-dimensional evaluation framework covering technology application, educational effect, ethical norms, etc., to ensure the healthy and sustainable development of AI education.

This study has certain limitations: the data source is limited to the WOS Core Collection, and the literature of Chinese core journals is not included for comparative analysis, which may affect the comprehensiveness of the research conclusions. In the future, multi-database data can be integrated to carry out comparative research on Chinese and foreign AI education, so as to more accurately grasp the characteristics and gaps of China's research. In addition, this study focuses on bibliometric analysis, and the in-depth interpretation of research content and practical effects is insufficient. Future research can combine qualitative analysis methods such as policy text analysis and case study to further explore the internal logic and practical path of AI education development.

References

1. WChang, T. S., & Liao, X. M. (2025). Higher education governance and teaching transformation in the United States in the Computer Age: Past and Future [J]. Journal of Higher Education Management, 19(06): 1-14. https://doi.org/10.13316/j.cnki.jhem.20251020.001.
2. Yi, Z. D., & Zhang, Z. C. (2025). Artificial intelligence empowering legal publicity and education: Transformations, risks, and responses—An investigation from the perspective of Bourdieu's field theory [J/OL]. Journal of Chengdu University of Technology (Social Sciences Edition). https://link.cnki.net/urlid/51.1641.C.20250702.1559.002
3. Tian, Y., & Lu, L. (2025). Artificial intelligence empowering higher education: Subjectivity dilemmas and path reconstruction [J]. Journal of Chengdu University of Technology (Social Sciences Edition), 33(5), https://kns.cnki.net/kcms2/article/abstract?v=A8ynNhXZdPmBEi7UxpoqNFqrgW2KGrf9S-PsYUyqOnKKsi4S0U0EhjhIVFSOFi6qHYK9YWcxfL038vB2ggb_IcSZ1DBzWXATA6OyuXwLJ-HiWWLPdAz5Bi_c9FrKNl7GV0XR0F6wcS40QtHiNQex2ha31nzYSaU7gpi-b1D14ae6ms-ZUtUOqA==&uniplatform=NZKPT&language=CHS
4. Ryan, J. (2025). What would an AI university look like and how might it change education? [J]. Nature, 648(8093), S92-S95. https://doi.org/10.1038/D41586-025-03950-4
5. Diaz, K. M. (2026). Making sense of AI in teacher education: A qualitative study of perceptions, practices and pedagogical tensions [J]. Teaching and Teacher Education, 171, 105342. https://doi.org/10.1016/J.TATE.2025.105342
6. Jiang, F. J., Shi, Y. J., & Liu, Y. X. (2025). AI literacy courses in K-12 science education in the United States: Technological application + digital ethics [J/OL]. Studies in Foreign Education, (10), 19-36. https://doi.org/10.20250/j.sfe.2025.10.002
7. Deng, L. B. (2025). Regulations and policies on AI literacy: EU norms and the "Chinese path" [J/OL]. Library, 1-7. https://link.cnki.net/urlid/43.1031.G2.20251127.1540.004
8. Li, Y., & Li, J. C. (2025). Digital transformation of education in Finland from the perspective of the technology socialization paradigm [J/OL]. Studies in Foreign Education, (10), 65-83. https://doi.org/10.20250/j.sfe.2025.10.004

9. Wang, Y., & Peng, D. D. (2025). Key measures and practical characteristics of the digital transformation of education inspection in the United Kingdom [J/OL]. Journal of Comparative Education, 1-16. https://link.cnki.net/urlid/31.2173.G4.20250923.1726.004
10. Zhao, J. C. (2023). The internal mechanism of in-depth integration between ideological and political education and artificial intelligence [J]. Ideological and Theoretical Education, 2023, (08): 94-100. https://doi.org/10.16075/j.cnki.cn31-1220/g4.2023.08.008.
11. Ye, H. Y., & Yang, Y. X. (2025). Research on the ideological identification ability of college ideological and political theory teachers in the digital intelligence era [J/OL]. Journal of Chengdu University of Technology (Social Sciences Edition), 1-14. https://link.cnki.net/urlid/51.1641.C.20251119.1320.002
12. Wang, X. W., & Wu, C. S. (2025). Generative artificial intelligence empowering ideological and political education: Mechanisms, risk challenges, and practical paths [J/OL]. Journal of Chengdu University of Technology (Social Sciences Edition), 1-8. https://link.cnki.net/urlid/51.1641.C.20250811.1008.002
13. Zhang, H. Q., Zhang, Y. L., Wang, C., et al. (2025). Research on the governance path of human-AI trust in intelligent education scenarios—An fsQCA analysis based on social cognitive theory [J/OL]. Journal of Chengdu University of Technology (Social Sciences Edition), 1-15. https://link.cnki.net/urlid/51.1641.c.20250611.1343.002
14. Liang, C. F. (2025). A new form of ideology in the age of artificial intelligence: The emergence, manifestations, and governance of algorithmic hegemony [J/OL]. Journal of Chengdu University of Technology (Social Sciences Edition), 1-17. https://link.cnki.net/urlid/51.1641.c.20251127.0914.003
15. Liang, C. L. (2025). Research on the construction of curriculum leadership model and development strategies for college teachers in undergraduate universities [D]. Master's Thesis, Henan Normal University. https://doi.org/10.27118/d.cnki.ghesu.2025.000002.
16. Xue, S. M., Yan, Y. Y., & Xu, M. J. (2024). Teachers' AI literacy: Teacher preparation in the age of artificial intelligence—An analysis based on UNESCO's "AI CFT" framework and 7 policy texts [J]. Teacher Education Research, 36(4), 105-113. https://doi.org/10.13445/j.cnki.t.e.r.2024.04.014