A bibliometric analysis of Artificial Intelligence research in higher education policy: Trends and future directions (2020–2025)

Damla KARAGOZLU[1], Ahmet ADALIER[1], Japheth Ahmed NUHU[2],

[1] Cyprus International University,
Department of Management Information Systems, Nicosia

[2] Cyprus International University, Department of Business Administration, Nicosia

dkaragozlu@ciu.edu.tr, aadalier@ciu.edu.tr, jnuhu@ciu.edu.tr

Abstract: *The advent of AI-driven GPTs (Generative Pre-trained Transformers) has caused substantial transformations in higher education. This study seeks to outline significant trends, prominent authors, and nascent research trajectories through bibliometric analysis of artificial intelligence (AI) research in higher education policy from 2020 to 2025. The research obtained 254 articles from the Scopus database. Keyword co-occurrence, co-authorship, and co-citation mapping were utilised to shed light on the interconnection and intellectual landscape within the subject domain. The findings indicate that "Artificial Intelligence" and "Higher Education" are the predominant themes, whereas emerging themes encompass "ChatGPT", "Generative AI", and "Academic Integrity", reflecting an increasing scholarly focus on generative AI technologies and their implications for the educational sector. The paucity of policy-related terminology underscores a research shortfall in the regulatory and ethical frameworks governing the application of AI in higher education. The results of co-authorship show an imbalanced collaboration structure, while the results of co-citation show a few important authors and methodological anchors, such as Braun and Clarke (2006) and Chan (2023). The study emphasises the swift expansion and inconsistent progression of AI-related higher education policy research. To ensure that AI technologies are used in a responsible, fair, and enduring manner within higher education systems around the world, it calls for greater collaboration across fields and research that focusses on policy.*

Keywords: Artificial Intelligence, Higher education policy, Bibliometric analysis, Generative AI, Academic integrity, Collaboration networks.

1. Introduction

The landscape of higher education is evolving rapidly. Digital instruction has evolved as a novel pedagogical approach since its proliferation during the COVID era. Currently, emerging technologies, including AI tools such as ChatGPT, are transforming the landscape of higher education in a disruptive way (Yu, 2024). Since the advent of AI, researchers have undertaken various investigations that

have enhanced the current body of knowledge. Research on AI in higher education policy receives minimal attention or is somewhat overlooked.

Institutional regulations play a crucial role in upholding ethical standards during the incorporation of AI in higher education (Jin et al., 2025). The demand for clearly defined standards and policies has become evident due to the widespread use of AI in educational environments (Schiff, 2022). These policies are essential for guiding the incorporation of AI into curriculum development and assessment design, as well as for maintaining academic integrity. Recent research has initiated an examination of these policies and institutional strategies for AI adoption; nevertheless, it remains fragmented, lacking a cohesive understanding of intellectual trends, principal contributors, and policy trajectories affecting AI in higher education. This gap highlights the necessity of mapping the existing body of work to elucidate the thematic patterns of AI in higher education.

This study addresses this gap by conducting a bibliometric analysis of artificial intelligence research related to higher education policy from 2020 to 2025. This research aligns with SDG 4 (Quality Education) by highlighting how AI fosters inclusive and equitable transformation. This study seeks to analyse global research trends in AI related to higher education policy from 2020 to 2025 using bibliometric methods. This study enhances existing knowledge by emphasising the need to develop informed policies governing AI deployment, while also outlining thematic trends, collaborative networks, and intellectual frameworks. The study will address the following research questions:

RQ1: What are the dominant themes and emerging topics in AI research within higher education policy from 2020 to 2025 (Co-occurrence analysis of author keywords)?

RQ2: Which publications form the intellectual foundation of AI-related higher education policy research, and how are they interconnected (Co-citation analysis of cited references)?

RQ3: Who are the most influential authors in this field, and what patterns of scholarly collaboration and intellectual influence can be observed (Co-authorship analysis and Co-citation analysis of authors)?

2. Method

To gain a thorough understanding of a particular event, a quantitative research technique was employed, which enables the methodical collecting and analysis of data (Taherdoost, 2022). Bibliometric analysis illustrates the intellectual framework, objective frameworks, and the development of research within a particular topic by utilising quantitative data from academic publications and incorporating contextual mapping tools to improve analytical precision (Olaleye et al., 2023).

2.1 Data source for bibliometric

Scopus was chosen as the database for this investigation. Because it contains a greater number of articles than other scientific databases such as WoS (Pranckutė, 2021). More than 5000 foreign publishers have contributed 75 million scholarly articles to this database.

2.2 Search and screening strategy

To ensure that the search process covers all research publications within the selected knowledge domain, an extensive compilation of keywords will enable thorough and integrated enquiries (Kumar, 2025). This study has methodically arranged the search duration, file type, and terms/keywords filters. The authors retrieved data from Scopus on 30th September 2025. The keywords used include: ('Higher Education' OR 'University') AND ('AI' OR 'Artificial Intelligence') AND ('Policy'). There was a total of 403 documents containing the keywords, and when the authors restricted the language to English, 386 articles were found. Furthermore, when the document type was limited to articles, 261 articles were identified. A total of 254 articles were retrieved for analysis, limiting the year of publication from 2020-2025.

2.3 Data analysis

The research employed VOSviewer to evaluate 254 published papers from the Scopus database. Van Eck and Waltman (2014) created the software VOSviewer to construct and visualise bibliometric networks.

3. Data analysis and results

3.1 Co-occurrence analysis of author keywords

The main goal of employing network visualization to analyse keyword co-occurrence is to investigate the connections between phrases used by researchers in a certain topic. The goal of this study is to understand the topic's corpus of information comprehensively. To identify the dominant themes and emerging topics in artificial intelligence research within higher education policy from 2020 to 2025, a co-occurrence analysis of authors' keywords was conducted. The minimum requirement for occurrences of an author's keyword was 2; 215 met the threshold, resulting in 14 clusters with 4222 links. Figure 1 presents the map of the structure and thematic patterns in AI-related higher education policy research from 2020 to 2025.

The author reported the top 10 keywords with the highest co-occurrences. The result shows that 'Artificial Intelligence' (154 occurrences), 'Higher Education' (147 occurrences), 'Generative AI' (68 occurrences), 'ChatGPT' (61 occurrences), 'Students' (32 occurrences), 'Academic Integrrity' (30 occurrences), 'University' (19

occurrences), 'Education' (15 occurrences), 'Engineering Education' (14 occurrences), and 'Human' (13 occurrences) had the highest occurrences. The data suggest that research on policies that could potentially shape higher education in the era of artificial intelligence is scarce, which offers significant prospects for further investigation and contributions to the field. See Table 1.

Figure 1. Structural and thematic patterns in AI-related higher education policy research from 2020 to 2025

Table 1. Co-occurrence analysis of author keywords

Keyword	Occurrences	Total Link Strength
Artificial Intelligence	154	707
Higher Education	147	648
Generative AI	68	323
ChatGPT	61	278
Students	32	273
Academic Integrity	30	121
University	19	175
Education	15	124
Engineering Education	14	112
Human	13	173

3.2 Co-citation analysis of cited references

Co-citation analysis was conducted, and the cited references field was selected to demonstrate the interconnectedness of AI-related intellectual higher education policy research. The minimum citation requirement for referenced sources was set at 2, and 177 sources met this threshold, resulting in 15 clusters

with a total of 747 links. Figure 2 represents the interconnectedness of AI-related higher education policy research from 2020 to 2025.

Table 2 shows that the most cited reference is 'Braun, Virginia, using thematic analysis in psychology, qualitative research in psychology, 3, 2, pp. 77-101, (2006),' which has a total of 20 citations. Followed by 'Chan, Cecilia Ka Yuk, students' voices on generative AI: perceptions, benefits, and challenges in higher education, international journal of educational technology in higher education, 20, 1, (2023)' with 18 citations, and 'Chan, Cecilia Ka Yuk, a comprehensive AI policy education framework for university teaching and learning, international journal of educational technology in higher education, 20, 1, (2023)' with 16 citations.
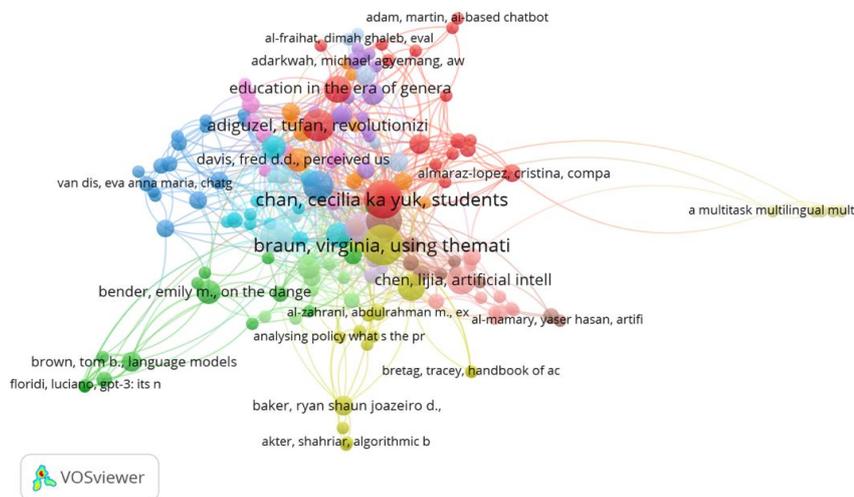
Figure 2. Interconnectedness of AI-related higher education policy research from 2020 to 2025

Table 2. Co-citation analysis of cited references

Cited reference	Citations	Total link strength
'Braun, Virginia, Using thematic analysis in psychology, qualitative research in psychology, 3(2), (2006).	20	55
Chan, Cecilia Ka Yuk, Students voices on generative AI: perceptions, benefits, and challenges in higher education, international journal of educational technology in higher education, 20(1), (2023).	18	54
Chan, Cecilia Ka Yuk, A comprehensive AI policy education framework for university teaching and learning, international journal of educational technology in higher education, 20(1), (2023).	16	53

Adiguzel, Tufan, Revolutionizing education with AI: exploring the transformative potential of chatgpt, contemporary educational technology, 15(3), (2023).	13	45
Cotton, Debby R.E., Chatting and cheating: ensuring academic integrity in the era of chatgpt, innovations in education and teaching international, 61(2), (2024).	13	35
Plata, Sterling M., Emerging research and policy themes on academic integrity in the age of ChatGPT and generative AI, asian journal of distance education, 19(4), (2023).	11	33
Atlas, S. ChatGPT for higher education and professional development: A guide to conversational AI. (2023).	11	32
Chen, Lijia, Artificial intelligence in education: a review, ieee access, 8, (2020).	10	19
Bearman, Margaret L., Discourses of artificial intelligence in higher education: a critical literature review, higher education, 86(2), (2023).	9	21
Baidoo-Anu, D., & Ansah, L. Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning, journal of AI, 7(1), (2023).	9	24

3.3. Co-authorship analysis and co-citation analysis of authors

To analyse the author's productivity, collaborative clusters, and intellectual impact, co-authorship and co-citation were conducted. The co-authorship field was selected together with the author; the minimum number of documents per author was set at 2, and 21 met the threshold. The largest set of connected items consists of 4 items. Table 3 reports the top 10 authors. The result of the co-authorship analysis shows that 'Bearman, Margaret L' have received 106 citations, 'Cowling, Michael A' and 'Crawford, Joseph A' had 105 citations each, while 'Pisica, Alina Iorga' and 'Zaharia, Rodica Milena' received 97 citations each. Furthermore, 'Acosta-Enriquez, Benicio Gonzalo', 'Arbulú Ballesteros, Marco Agustín', and 'Arbulú-Pérez Vargas, Carmen Graciela' had 2 documents each with 50 citations. Figure 3 present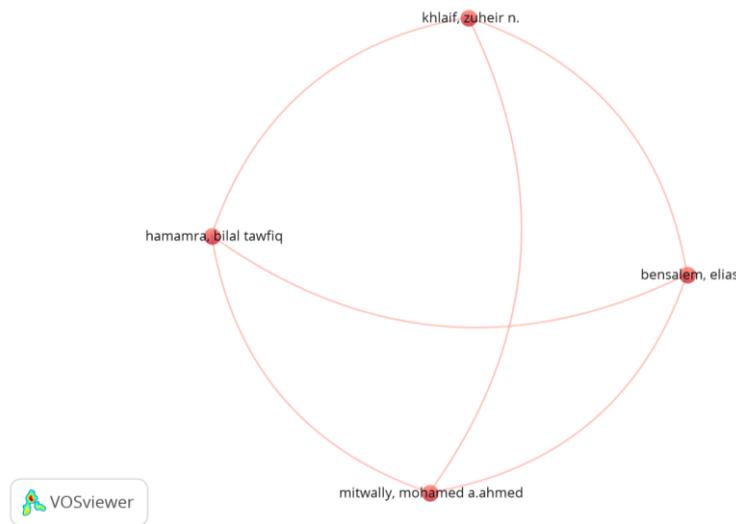s the network dynamics, research productivity, and international partnerships in AI-related higher education policy research from 2020 to 2025.

Table 3. Co-authorship analysis

Author	Documents	Citations	Total link strength
Bearman, Margaret L.	2	106	2
Cowling, Michael A.	2	105	3
Crawford, Joseph A.	3	105	4
Pisica, Alina Iorga	2	97	2

Zaharia, Rodica Milena	2	97	2
Acosta-Enriquez, Benicio Gonzalo	2	50	4
Arbulú Ballesteros, Marco Agustín	2	50	4
Arbulú-Pérez Vargas, Carmen Graciela	2	50	4
Kelder, Jo Anne	2	47	3
Mitwally, Mohamed A. Ahmed	2	37	6

Figure 3. The network dynamics, research productivity, and international partnerships in AI-related higher education policy research from 2020 to 2025

For the co-citation analysis, the co-citation and cited authors fields were selected. 2 was the minimum number of citations for an author; 114 met the threshold. The largest connected set consists of 93 items, yielding 11 clusters and 310 links. The results of the top 10 most cited authors show that 'Chiu' and 'Thomas K.F.' had the highest citation (19 citations), while 'Bearman' received 17 citations each (refer to Table 4). Figure 4 presents the intellectual structure of AI-related higher education policy research from 2020 to 2025.

Table 4. Co-citation analysis of cited author

Author	Citations	Total Link Strength
Chiu	19	72
Thomas K.F.	19	72
Bearman	17	30
Adiguzel	13	45
Cotton	13	38
Debby R.E.	13	38
Tufan	13	45

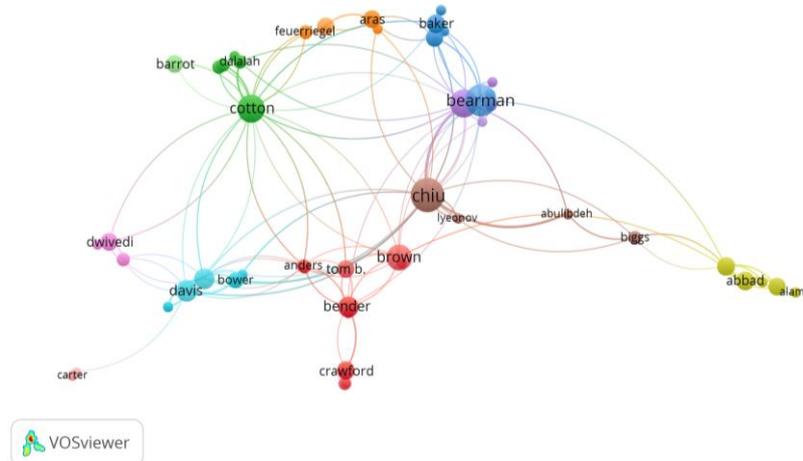| Brown | 11 | 21 |
| Davis | 8 | 25 |
| Bender | 7 | 17 |

Figure 4. Intellectual structure of AI-related higher education policy
research from 2020 to 2025

4. Discussions and conclusions

This bibliometric analysis provides a comprehensive overview of research pertaining to AI in higher education policy from 2020 to 2025. The keyword co-occurrence data show that "Artificial Intelligence" and "Higher Education" are the most common terms in this field. Evolving terms like "ChatGPT," "Generative AI," and "Academic Integrity" reveal that scholars are developing an interest in the teaching and moral issues associated with generative AI technologies. The relative scarcity of explicit policy-related keywords suggests that research on governance frameworks and regulations for artificial intelligence in higher education is inadequate, underscoring a vital field for additional exploration.

The examination of co-authorship indicates that collaboration in this domain remains inadequate. Only 21 authors satisfied the publication criterion, and the most extensive collaborative network comprises merely four contributors. Berman, Margaret L., Colling, Michael A., and Crawford, Joseph A. are the principal contributors, each with over 100 citations. This restricted link suggests that research on higher education policy concerning AI is in its nascent phase and may gain from interdisciplinary collaboration and strengthened institutions. The co-citation study categorised 114 writers into 11 groups, including Thomas K. F., Chiu, and Berman who are the most often referenced authors. At the citation level, Brown and Clarke (2006) and Chen, C. K. C. Y. (2023) were the most distinguished. This indicates that the region emphasises both methodological rigour and contemporary concerns associated with generative AI and educational policy.

This paper presents a thorough bibliometric analysis of artificial intelligence research in higher education policy from 2020 to 2025. The analysis indicates that, despite extensive research on AI, particularly generative tools such as ChatGPT, insufficient attention is paid to policy formulation, management, or the establishment of ethical frameworks. The findings regarding author engagement indicate that the scientific community has become fragmented, exhibiting less international collaboration. A limited cohort of distinguished academics establishes the theoretical and methodological underpinnings of the discipline, as evidenced by prevalent citation patterns. These findings underscore the need for interdisciplinary, policy-oriented research that examines the influence of technology on institutions and ethics. Enhancing collaborative networks and developing evidence-based policy frameworks will promote the ethical application of AI, particularly in education. Consequently, forthcoming research must extend beyond descriptive studies to yield actionable insights that facilitate management and strategic planning within the evolving, AI-driven educational landscape.

5. Theoretical and practical implications

Theoretically, this study contributes to understanding the intersection of AI and higher education policy by revealing the field's intellectual structure and research dynamics. The dominance of pedagogical and ethical themes, alongside limited attention to policy frameworks, highlights the need for integrative theoretical models that connect technological innovation, governance, and educational equity. These insights suggest a shift toward socio-technical perspectives that emphasize the interdependence between technology, institutional policy, and learning outcomes. Practically, the findings underscore the urgency of developing clear governance frameworks to guide AI implementation in higher education. Policymakers and institutional leaders should address issues of academic integrity, data protection, and ethical accountability while fostering international collaboration and knowledge exchange. Strengthening institutional capacity and aligning AI strategies with the United Nations Sustainable Development Goal 4 (SDG 4) can ensure inclusive and equitable digital transformation across higher education systems.

6. Directions for future research

Future studies should examine how AI-driven changes affect institutional governance, policymaking, and educational results in addition to descriptive assessments. Longitudinal and mixed-method studies are essential for monitoring thematic evolution and correlating bibliometric trends with policy outcomes. Comparative investigations among areas may reveal contextual differences in AI adoption and policy preparedness, while multidisciplinary frameworks that combine education, technology, and public policy might enhance comprehension of ethical and operational concerns. Furthermore, subsequent research should

investigate the influence of leadership, stakeholder involvement, and capacity enhancement on the integration of responsible AI in alignment with sustainable development and global equity objectives.

REFERENCES

Jin, Y., Yan, L., Echeverria, V., Gašević, D. & Martinez-Maldonado, R. (2025) Generative AI in higher education: A global perspective of institutional adoption policies and guidelines. *Computers and Education: Artificial Intelligence*. 8, 100348. https://doi.org/10.1016/j.caeai.2024.100348.

Kumar, R. (2025) Bibliometric analysis: comprehensive insights into tools, techniques, applications, and solutions for research excellence. *Spectrum of Engineering and Management Sciences*. 3(1), 45-62. https://doi.org/10.31181/ sems31202535k.

Olaleye, S. A., Mogaji, E., Agbo, F. J., Ukpabi, D. & Gyamerah Adusei, A. (2023) The composition of data economy: a bibliometric approach and TCCM framework of conceptual, intellectual and social structure. *Information Discovery and Delivery*. 51(2), 223-240. https://doi.org/10.1108/IDD-02-2022-0014.

Pranckutė, R. (2021) Web of Science (WoS) and Scopus: The titans of bibliographic information in today's academic world. *Publications*. 9(1), 12. https://doi.org/10.3390/publications9010012.

Schiff, D. (2022) Education for AI, not AI for education: The role of education and ethics in national AI policy strategies. *International Journal of Artificial Intelligence in Education*. 32(3), 527-563. https://doi.org/10.1007/s40593-021-00270-2.

Taherdoost, H. (2022) What are different research approaches? Comprehensive review of qualitative, quantitative, and mixed method research, their applications, types, and limitations. *Journal of Management Science & Engineering Research*. 5(1), 53-63. https://doi.org/10.30564/jmser.v5i1.4538.

van Eck, N.J., Waltman, L. (2014) Visualizing Bibliometric Networks. In: Ding, Y., Rousseau, R., Wolfram, D. (eds) *Measuring Scholarly Impact*. Springer, Cham. https://doi.org/10.1007/978-3-319-10377-8_13.

Yu, H. (2024) The application and challenges of ChatGPT in educational transformation: New demands for teachers' roles. *Heliyon*. 10(2). https://doi.org/10.1016/j.heliyon.2024.e24289.