Analysis of Artificial Intelligence Ethics & Policy in Education

Goreta Goreta[1*]; Basuki Wibawa[2]; Eveline Siregar[3]

[1] Universitas Negeri Jakarta, Jakarta, Indonesia
[2] Universitas Negeri Jakarta, Jakarta, Indonesia
[2] Unviersitas Negeri Jakarta, Jakarta, Indonesia
*goreta.sfic@gmail.com; bwibawa@unj.ac.id; esiregar@unj.ac.id

Abstract. Artificial Intelligence (AI) technology is growing rapidly and massively. Trends in the use of AI are spreading rapidly, as well as its use in the world of education and learning. AI has created a new transformation in education, teaching and learning. AI is recognized and has positive benefits and impacts on education. However, there are many concerns about the ethical implications of its use. This research is a systematic literature review (SLR) that aims to collect and analyze data on the ethics and policies of AI in education. Data collection was carried out through Harzing's Publish or Perish application, data presentation and analysis with the help of VOSviewer. A bibliometric analysis was performed on research and publication data found through the Scopus and Google Scholar databases from the period since the Covid-19 pandemic in 2020 to 2023. The findings of this study demonstrate the high level of research from year to year related to the ethics of AI in education. Suggestions for further research can be focused on ethical principles in using AI for education and learning.

Keywords: Artificial Intelligence, Ethics, Policy, Education.

1 Introduction

1.1 Research background and Urgency

The rapid progress of artificial intelligence has had a significant impact on various aspects of life, including in education. AI surges with the emergence of new tools constantly evolving. Bing chatbot from Microsoft, Google bard AI chatbot, ChatGPT chatbot made by OpenAI, are hot topics of conversation in the world of technology and education today. Since the early phase of the artificial-intelligence (AI) era, expectations have been high for AI, with experts believing that AI paved the way for managing and dealing with various global challenges [1] . Artificial intelligence is a rapidly growing technological domain capable of transforming every aspect of our social interaction [2] . UNESCO revealed that AI can be used to improve learning outcomes and help education systems use data in order to improve equity and quality of education [3] . The use of AI in education has great potential to increase the

M. Salimi et al. (eds.), *Proceedings of the 7th International Conference on Learning Innovation and Quality Education (ICLIQE 2023)*, Advances in Social Science, Education and Humanities Research 873,
https://doi.org/10.2991/978-2-38476-301-6_92

efficiency, effectiveness and personalization of learning. Even humans will delegate some decisions to machines even when those decisions are superior to human input [4]

However, the emergence of chatbots, AI-based robots, is also a dilemma for the academic world [5] . On the one hand it makes it easier for lecturers and students to obtain information, and on the other hand the risk of plagiarism and the accuracy of information, as well as other misuses, has a major impact on the world of education. To minimize the risk of errors in the use of AI requires ethics [6] . The ethics of AI in education is a complex issue and requires further research to ensure that the use of AI is responsible and benefits all parties. The rapid development of AI needs to be supported by the regulations and supervision necessary for AI-based technology to achieve sustainable development [7] . Failure to do so can result in gaps in transparency, security, and ethical standards.

Several previous studies have emphasized the importance of considering ethical aspects in the use and development of AI in various fields, but in the context of education, attention to the ethics of AI has not been fully presented in the existing literature. Interest is increasing and the deployment of AI technologies in domains that are important for sustainability, but few have explored possible systemic risks in depth [7] . To ensure that AI in education serves students and educators, and ethical issues can be answered, this field must receive attention [8] . Therefore the purpose of this research is to explore the development of research on the ethics of AI in education through a bibliometric approach. Through bibliometric research, trends, main ideas, and research gaps on AI ethics in education can be identified.

Some questions that will help researchers get the information needed on this topic are as follows:

RQ1 What are the trends in AI ethics research and publication in education in 2021-2023?

RQ2 Who are the authors and which institutions have been productive, effective, and influential in the study of the ethics of AI in education?

RQ3 What are the aspects discussed in research related to the ethics of AI in education?

Through this research, it is hoped that the latest research trends on AI ethics and policies in education can be revealed, the most productive and influential authors and institutions, as well as aspects discussed in research through the keywords found. In addition, it can also identify existing research gaps, which will provide guidance for researchers and educational practitioners to direct the focus of further AI ethics research and development in the future.

By knowing and understanding more deeply about the development of AI ethics in education, we can face the challenges and opportunities posed by the use of AI in a responsible manner, and have a contribution for stakeholders to design policies related to ethics, and contribute to academic literature.

1.2 Theory Basis and Relevant Research

1.2.1 Artificial Intelligence in Education

Technology that mimics human behavior by comprehending how the human brain functions and incorporating human functioning mechanisms into technology is known as artificial intelligence [12]. Humans bring intelligence to technological systems, which is then controlled and developed scientifically using data-based items. Machine intelligence is capable of demonstrating actions that would be regarded as intelligent if they were executed by humans.

AI has made great strides and is widely adopted in education. AI can improve learning outcomes, improve learning efficiency for students and facilitate educational procedures by providing convenience for teachers. These technological advances make it possible to predict innovative teaching methods in preparing professional roles for their advancement without endangering the participants themselves [15], including with the emergence of the latest technology-based learning media such as serious games, and also virtual reality. Although AI has made great strides in education, it has also brought various problems, including the ethics of AI used in education. UNESCO stated to complicate it regarding ethical issues such as educational equality, inclusiveness, data security, and transparency of data use and collection ([3]. Application of AI in education has ethical challenges and dilemmas [16]. Key ethical issues identified include AI bias, design ethics, consumer privacy, cyber security, individual autonomy and well-being, and shock [17].

Research into the ethics of AI in education is at its core a desire to support student learning. Ethical intent alone is not enough, and there is a need to consider issues such as fairness, accountability, openness, bias, autonomy, governance and inclusion ([18]. Adoption of Artificial Intelligence in education and learning can increase ethical risks and various concerns regarding other aspects ([19]. In education it is necessary to develop an approach that combines ethics and career future ([20], which aims to increase AI literacy. AI literacy is important in understanding ethics in education.

1.2.2 Artificial Intelligence Ethics and Policy in Education

Advances in artificial intelligence in education have the potential to change the landscape of education and influence the roles of all stakeholders involved. The application of AI in education has been implemented to improve understanding of learning and performance, but has led to increased risks and ethical concerns regarding aspects such as personal data and learner autonomy [13] . The ethical issue of AI in education poses major challenges to researchers and practitioners, particularly with regard to privacy and welfare issues (Dignum, 2021).

AI technology benefits humanity and all countries can benefit from it, but it also raises fundamental ethical issues. AI ethics must move from the current state of affairs, where non-humans are usually ignored, to one where non-humans are given more consistent and widespread moral consideration [14] . As AI is in a high-risk area, the pressure is increasing to design and regulate AI to be accountable, fair and

transparent is also strong [12] . AI itself has a moral status [8] . Several studies have built on this philosophical conceptualization as a framework for forming a model of the practical implementation of AI ethics [9] , using a socio-legal perspective to analyze the use of ethical guidelines as a governance tool in the development and use of artificial intelligence ([9] , management's understanding of moral terms). , ethics, and artificial intelligence, as well as understanding the ethical principles of AI used [10] , and investigates the educational implications of emerging technologies on the way students learn and how institutions teach and develop [1] , describes the latest sophistication in artificial intelligence (AI) and its potential impact on learning, teaching, and education [11] , as well as a systematic mapping study (SMS) Keyword-based research on AI ethics can be conducted to help identify, challenge, and compare the main concepts used in current AI ethics discourse.

1.3 Research Purposes

This study aims to determine:

1.3.1 Research trends and publications of AI ethics in education in 2021-2023.

1.3.2 Writers and institutions who are productive, effective, and influential in the study of the ethics of AI in education.

1.3.3 Ethical aspects discussed in the research.

Through this research, it is hoped that trends in the ethical aspects of the latest research trends on AI ethics and policies in education, the most productive and influential authors and institutions can be revealed. What is novel in this research is the current ethical aspect being studied. In addition, it can also identify existing research gaps, which will provide guidance for researchers and educational practitioners to direct the focus of further AI ethics research and development in the future.

2 Methodology

This study aims to identify publications related to ethics and policies on the use of artificial intelligence in education, learning, teaching and learning. This study uses bibliometric analysis. The bibliometric analysis method is an effective approach to collecting data regarding the number and distribution of scientific publications that are relevant to the ethical topic of AI in education. Bibliometric research will help us get information about developments in the ethics of AI in education through statistical analysis and visualization. In this way, one gains a more comprehensive understanding of the topic and can highlight areas of research that are in greater need of further exploration.

2.1 Research Design

This study uses visualization methods and bibliometric analysis. Since Alan Pritchard defined bibliometrics as “the application of statistical methods to the media of communication” in 1969, bibliometric analysis has been widespread ([9] .

Bibliometric analysis is the use of statistical methods to analyze scientific publications and literature. Bibliometrics is defined as “the application of mathematical and statistical methods for books and other communication media ([9]) . Bibliometric analysis itself can be carried out by following the following steps: determining the topic to be studied and collecting bibliographies, identifying journals or conferences that are relevant to the research topic, extracting bibliographic data from journals or other sources. others relevant to the research topic and analyzed the data using bibliometric applications, such as VOSviewer and Harzing's Publis or Perish.

2.2 Research Subject

The samples for this research are two sources, namely: (1) 60 publications from 2020 to 2023 obtained from the Scopus database, obtained through a search for Harzing's Publish or Perish using the keywords “Artificial Intelligence Ethics in Education” with the publication name “Journal ”, and (2) as many as 665 publications from 2020 to 2023 obtained through searches on website *dimensions* with keywords “Artificial Intelligence Ethics in Education”, publication type “Article”, Research Categories: Sustainable Development Goals “4 Quality Education”, Source Title “Educational and Information Technology OR Education Studies OR Frontiers in Education OR British Journal of Education Technology OR Computers and Education Artificial Intelligence OR International Journal of Artificial Intelligence OR International Journal of Emerging Technology OR Frontiers in Psychology OR Sustainability OR IEEE Access OR Heliyon”.

2.3 Research Indicators

Publications selected in the last 3 years after the covid-19 pandemic, namely from 2020 to 2023 using the Harzing's Publish or Perish application to retrieve data from Scopus, and data from website dimensions and perform analysis and display using VOSviewer with three views , namely network visualization, overlay visualization, and density visualization.

2.4 Research Procedure

The researcher collected metadata based on the Harzing's Publis or Perish database through a Scopus search with the keyword "Artificial Intelligence Ethics in Education" and the Publication name "Journal" in the last 3 years, namely 2020 to 2023. The VOSviewer application is used to analyze and visualize data, as well as evaluate all information about publications that has been collected in this field, such as: author's bibliographical pair, country, institution, journal and co-occurrence of author keywords.

Table 1. Number & percentage of publications on AI Ethics in Education from journal Scopus based on Harzing's Publish or Perish search

Year	Publications	Percentage
2023	12	20%
2022	21	35%
2021	15	25%
2020	12	20%
Total	60	100%

In the table above it can be seen that the highest number of publications will be in 2022, namely 35%. From 2020 to 2022 there has been an increase in the number of publications. Data is collected up to June in 2023, therefore the number of publications from January to June 2023 is 12 Scopus indexed journals, which is 20% of the total number of publications throughout the study period.

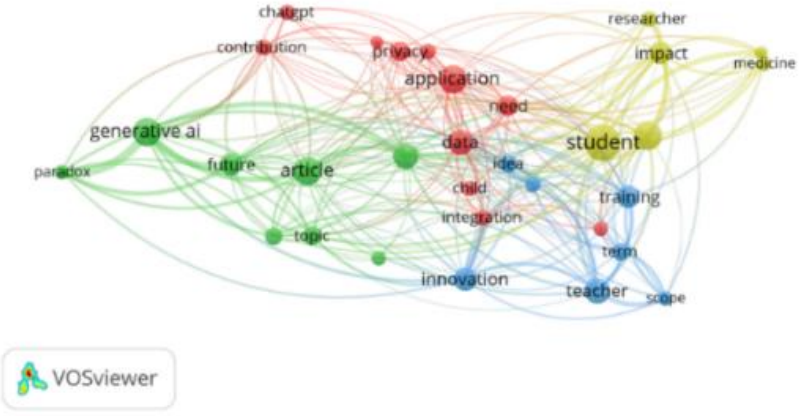

Fig. 1. Network Visualization of Keywords.

Network visualization of keywords, displays a visual network display of the appearance of keywords together with article sources from Scopus. The researcher takes a threshold at this stage, namely the minimum number of co-appearances is 5. Out of 1436 keywords, 53 keywords meet the threshold. Cluster 1 has the word "data" with 146 total connection strengths, followed by "application" with 139 link strengths and "contribution" with 68 link strengths.. In cluster 2, "generative ai" with 292 link strengths, "articles" with 167 link strengths, "paradox" with 156 link strengths. Cluster 3, "innovation" with 174 link strengths.

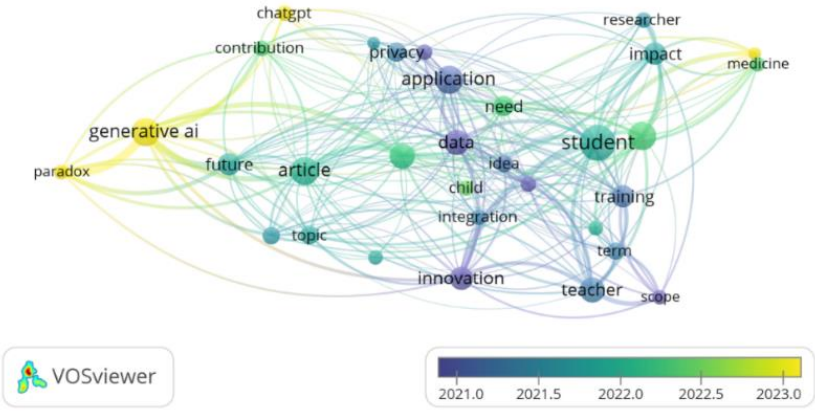

Fig. 2. Overlay Visualization of Keywords.

Table 2. Number & percentage of publications on the topic "Artificial Intelligence Ethics in Education from searches through website *dimensions*

Year	Publications	Percentage
2023	148	23%
2022	270	40,6%
2021	166	25%
2020	81	12,2%
Total	665	100%

3 Results and Discussion

3.1 State Bibliographical Partners

The image above, which shows the network visualization, displays country bibliographic pairs. At this point, researchers employ a cutoff, which is five articles, minimum, from each nation. 43 of the 81 nations that make up the world fit this criteria. China tops the list in terms of total link power with 8970 total links, 999 citations, and 160 publications. The United States comes in second with 6743 total link strengths, 571 citations, and 74 publications. The United Kingdom is in third place, with 4119 total links, 228 citations, and 33 publications. Furthermore, the researcher will order it as follows to display other countries: the first number is the overall link strength, the second number is the number of citations, and the third number is the number of publications. These countries are: Finland (3757, 139, 18),

Australia (3652, 472, 34), Spain (3047, 589, 41), Malaysia 92380, 155, 25), Sweden (2353, 61, 14), Germany (2346, 136, 32), Taiwan (1706, 330, 24), Saudi Arabia (1583, 150, 15), South Korea (1477, 95, 19), Norway (1413, 105, 11), Brazil (1258, 123 , 15), Indonesia (1168, 85, 9), Portugal (1143, 170, 13), Switzerland (1052, 30, 6), Singapore (995, 5, 5), Mexico (987, 89, 12), Pakistan (926, 6, 5), Italy (911, 38, 10), Denmark (836, 12, 5), Netherlands (816, 58, 11), Vietnam (813, 24, 5), Chile (806, 58, 6), South Africa 9796, 150, 11), New Zealand (778, 70, 7), Canada (772, 38, 12), France (759, 20, 8), Japan (699, 90, 8), Turkey (613, 60, 9), Greece (607, 115, 12), Ireland (560, 19, 6), India (518, 157, 10), Thailand 9368, 44, 7), Romania (341, 357, 100), United Arab Emirates (341, 99, 6), Cyprus (340, 91, 7), Russia (335, 82, 12), Belgium (327, 47, 6), Belgium (327, 47, 6), Ecuador (290, 50, 8), Bangladesh (285, 56, 5), Israel (276, 63, 8). In the picture above, it can be seen that there are different colors indicating the distribution of different clusters or groups where the groups are based on the intensity of the relationship with one another. Cluster 1 (11 items) consisting of: Bangladesh, India, Indonesia, Japan, Malaysia, Pakistan, Russia, Saudi Arabia, Taiwan, Thailand and United Arab Emirates. Cluster 2 (10 items), consisting of Australia, Canada, Ecuador, Israel, New Zealand, Norway, South Africa, Turkey, United Kingdom, and Vietnam. Cluster 3 (9 items) consisting of: Cyprus, Denmark, France, Germany, Greece, Italy, Portugal, Romania, and Zwitzerland), and Cluster 4 (7 items) consisting of Brazil, China, Finland, Singapore, South Korea , Sweden, United States. Cluster 5 (6 items) consisting of: Belgium, Chile, Ireland, Mexico, Nederlands, and Spain.

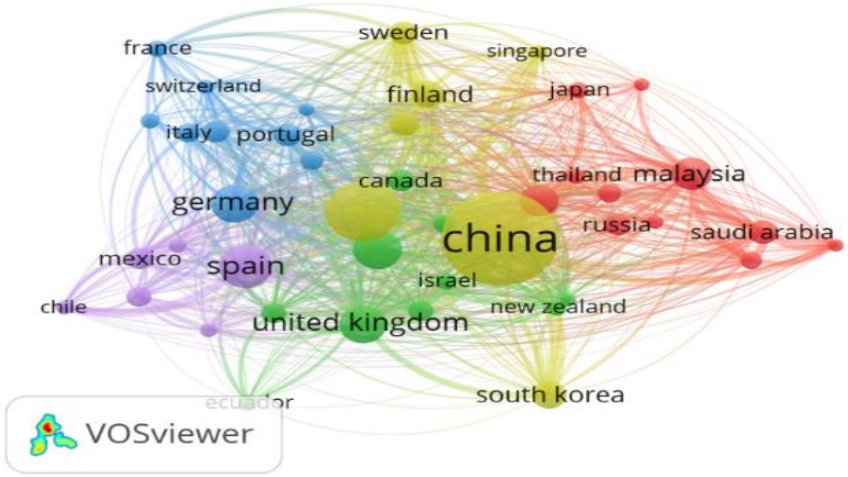

Fig. 3. Network Visualization of country pairs.

3.2 Organization Bibliography Pairs

The institution bibliography pairs shown in the image above are displayed with an overlay visualization. At this point, the researcher employs a criterion, namely 5 papers from an institution that have been cited at least 5 times. Only 24 organizations out of 784 meet this standard. The University of Hong Kong ranks top in total link strength, with 804 total link linkages, 149 citations, and 9 publications. Monash University came in second with 734 total links, 220 citations, and 9 publications. Education University of Hong Kong is in third place, with 720 total connections, 108 citations, and 9 publications. The Chinese University of Hong Kong is in fourth place, with 565 total link strengths, citations up from 201 in the previous order, and publications up from 10 in the previous order. Then the first number is the total strength of links, the second number is citations, and the third number is publication. , namely: University of Eastern Finland (500, 58, 7), University of Technology Sydney (475, 108, 5), Lingnan University (382, 172, 5), University of Cambridge (342, 30, 6), National University of Distance Education (308, 249, 5), University College London (265, 91, 6), Beijing Normal University (264, 40, 14), Carnegie Mellon University (261, 84, 5), University of Oulu (223, 18, 5), University of Almeria (188, 300, 6), Central China Normal University (175, 93, 12), Technical University of Munich (140, 10, 5), University Sains Malaysia (124, 23, 6) , University of South Australia (119, 39, 5), Gachon University (110, 17, 5), National Yunlin University of Science and Technology (109, 71, 5), Zhengzhou University (92, 7, 5), Monterrey Institute of Technology (86, 11, 9), National University of Malaysia (80, 14, 5), and University of South Africa (80, 67, 6). From the organizational bibliographic pair, there are 24 items consisting of 5 clusters. The first cluster (7 items), namely: Central China Normal University, Monterrey Institute of Technology of Higher Education, National University of Malaysia, University of Oulu, University of South Africa, University of South Australia. The second cluster (5 items), namely: Carnegie Mellon University, Monash University, Technical University of Munich, University College London, University of Technology Sydney. Cluster 3 (5 items), Chinese University of Hong Kong, Educational University of Hong Kong, Lingnan University, University of Eastern Finland, University of Hong Kong. Cluster 4 (5 items), namely: Beijing Normal University, Gachon University, University Science Malaysia, University of Cambridge. Cluster 5 (2 items), namely: National University of Distance Education, University of Almeria. The picture above shows several colors, ranging from blue, green, to yellow, where the yellow color indicates the latest publications, namely shown by: Monterrey Institute of Technology, University of Hong Kong, and the Technical University of Munich.

3.3 Author Bibliography Partner

The bibliography author pair is shown in the density visualization image above. The researcher uses a threshold at this stage, namely the minimum number of publications from one author is 3, and 3 are cited. Out of 2,302 authors, only 25 authors meet the threshold. Abad Segura, Emilio and Gonzales-Zamar, Mariana-Dniela took first place

with 946 total link strengths, 300 citations and 6 publications. Ng, Davy Tsz Kit ranks second with 929 total strengths, 77 citations, and 4 publications. Chu, Samuel Kai Wah ranks third with 825 link strengths, 110 citations and 5 publications. Then successively indicated by the first number is the strength of the law, the second number is the citation, and the third number is the number of publications, namely: Sanusi, Ismail Temitayo (748, 8, 4), Oyelere, Solomon Sunday (689, 14, 4), Vartiainen, Henrikka (673, 34, 3), Su, Jiahong (647, 79, 4), Xie, Haoran (546, 301, 6), Saini, Munish (502, 30, 3), Singh, Jaswinder (502, 30, 3), Singh Madanjit (502, 30, 3), Gaseviv, Dragan (441, 216, 7), Chen, Xieling (415, 93, 3), Zou, at (415, 93, 3), Cheng, Gary (370, 7, 3), Shum, Simon Bucjingham (282, 102, 3), Cukurova, Mutlu (143, 80, 3), Baker, Ryan S. (125, 56, 4), Zhang, Fengrui (107, 8 , 6), Bittencourt, ig Igbert (104, 75, 3), Zhu, Delong (93, 4, 3), Nguyen, Andy (83, 7, 3), Li, Hongming (47, 4, 3), Yang , Yuqin (12, 77, 3).

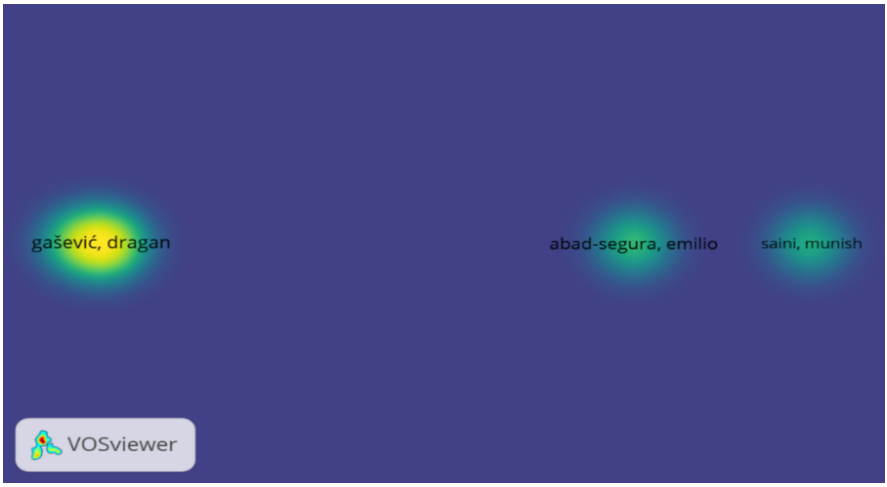

Fig. 4. Density Visualization of author bibliographic pairs

3.4 Document/ Publication Bibliography Pairs

Document bibliography (publication) pairs are shown in the image above which is displayed with the network visualization. At this stage, researchers use thresholds.

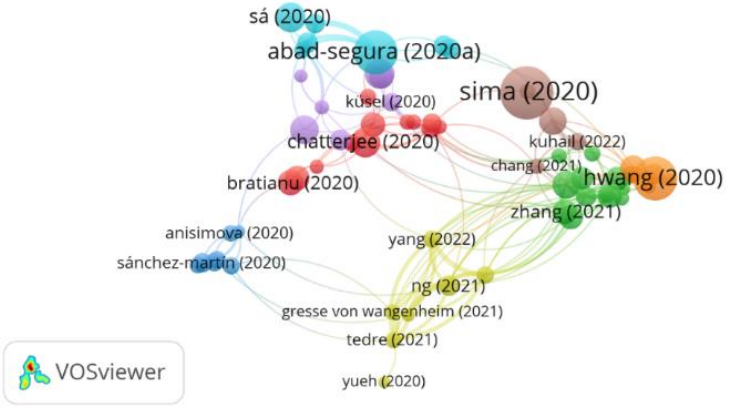

Fig. 5. Network visualization of publication bibliography pairs

4 Results

The trend and number of research and publications based on Harzing's Publish or Perish research has increased from 2020 to 2023, namely January-December 2020 by 20%, January-December 2021 by 25%, January-December 2022 by 35%, and January-June 2023 as much as 20 percent within 6 months; and based on searches from website dimensions there has also been an increase, namely January - December 2020 by 12.2%, January - December 2021 by 25%, January - December 2022 by 40.6%, and January - June 2023 by 22.3% in span of 6 months. Based on a search for productive, effective and influential institutions on research and publication of ethical AI in education, the highest ranking is China and the United States based on country bibliographic pairs, Hong Kong University and Monash University based on bibliographic organization pairs, Abad Segura, Emilio and Gonzales-Zamar , Mariana-Dniela based on author's bibliographical pair, and Chatterjee couple based on publication bibliography. Ethical aspects that are trending and are becoming new aspects discussed in research are discussions of various circles regarding the application of AI in various fields [21], synthesis of relevant ethical policies and guidelines for students, teachers, technology developers and policy makers [19], AI content and management of practical ethical issues posed by the utilization of AI [22]. What is novel in this research is the latest ethical aspects that are researched. Research and publications on the topic of ethics and policies regarding artificial intelligence in the field of education are increasingly in demand from year to year even though this research is limited only to the period of the covid-19 pandemic until this year when this data is retrieved. This is evidenced by the fact that every year research has increased in terms of number. The high interest in ethical aspects for students, teachers, policy makers in education can be seen from the heated discussions among various groups regarding the ethical aspects of using AI in various fields, specifically here in the field of education. Practical technical aspects of the ethics of AI in

education are important to implement AI optimally and get useful results, but this is also a limitation in this study. Therefore, the researcher recommends further research to focus on research by examining these things in the future.

References

1. S. Gupta *et al.*, "Assessing whether artificial intelligence is an enabler or an inhibitor of sustainability at indicator level," *Transp. Eng.*, vol. 4, p. 100064, 2021, doi: https://doi.org/10.1016/j.treng.2021.100064.
2. F. Pedro, M. Subosa, A. Rivas, and P. Valverde, "Artificial intelligence in education: Challenges and opportunities for sustainable development," 2019.
3. UNESCO, "Artificial intelligence in education: challenges and opportunities for sustainable development," *Unesco*, p. 46, 2019, [Online]. Available: https://en.unesco.org/themes/education-policy-
4. A. Agrawal, J. S. Gans, and A. Goldfarb, "Exploring the impact of artificialIntelligence: Prediction versus judgment," *Inf. Econ. Policy*, vol. 47, pp. 1–6, 2019, doi: https://doi.org/10.1016/j.infoecopol.2019.05.001.
5. C. Kooli, "Chatbots in Education and Research: A Critical Examination of Ethical Implications and Solutions," *Sustain.*, vol. 15, no. 7, 2023, doi: 10.3390/su15075614.
6. L. Floridi *et al.*, "AI4People—An Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations," *Minds Mach.*, vol. 28, no. 4, pp. 689–707, 2018, doi: 10.1007/s11023-018-9482-5.
7. R. Vinuesa *et al.*, "The role of artificial intelligence in achieving the Sustainable Development Goals," *Nat. Commun.*, vol. 11, no. 1, p. 233, 2020, doi: 10.1038/s41467-019-14108-y.
8. N. Bostrom and E. Yudkowsky, "The ethics of artificial intelligence," in *Artificial intelligence safety and security*, Chapman and Hall/CRC, 2018, pp. 57–69.
9. C. Zhang and Y. Lu, "Study on artificial intelligence: The state of the art and future prospects," *J. Ind. Inf. Integr.*, vol. 23, p. 100224, 2021, doi: https://doi.org/10.1016/j.jii.2021.100224.
10. M. Irfan, F. Aldulaylan, and Y. Alqahtani, "Ethics and Privacy in Irish Higher Education: A Comprehensive Study of Artificial Intelligence (AI) Tools Implementation at University of Limerick," *Glob. Soc. Sci. Rev. VIII*, pp. 201–210, 2023.
11. A. Owe and S. D. Baum, "Moral consideration of nonhumans in the ethics of artificial intelligence," *AI Ethics*, 2021, doi: 10.1007/s43681-021-00065-0.
12. G. M. Khalil and C. A. Gotway Crawford, "A Bibliometric Analysis of U.S.-Based Research on the Behavioral Risk Factor Surveillance System," *Am. J. Prev. Med.*, vol. 48, no. 1, pp. 50–57, 2015, doi: https://doi.org/10.1016/j.amepre.2014.08.021.
13. J. Baker-Brunnbauer, "Management perspective of ethics in artificial intelligence," *AI and Ethics*. Springer, 2021. doi: 10.1007/s43681-020-00022-3.
14. T. Ilkka, *The impact of artificial intelligence on learning, teaching, and education*. European Union, 2018.
15. B. Wibawa and P. B. Wibawa, "Serious game for leadership skills in the learning organization training," *Int. J. Eng. Adv. Technol.*, vol. 8, no. 6 Special Issue 3, pp. 942–947, 2019, doi: 10.35940/ijeat.F1067.0986S319.

16. S. Akgun and C. Greenhow, "Artificial intelligence in education: Addressing ethical challenges in K-12 settings," *AI Ethics*, vol. 2, no. 3, pp. 431–440, 2022, doi: 10.1007/s43681-021-00096-7.
17. S. Du and C. Xie, "Paradoxes of artificial intelligence in consumer markets: Ethical challenges and opportunities," *J. Bus. Res.*, 2021, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S0148296320305312
18. W. Holmes *et al.*, "Ethics of AI in Education: Towards a Community-Wide Framework," *Int. J. Artif. Intell. Educ.*, vol. 32, no. 3, pp. 504–526, Sep. 2022, doi: 10.1007/s40593-021-00239-1.
19. A. Nguyen, H. N. Ngo, Y. Hong, B. Dang, and B.-P. T. Nguyen, "Ethical principles for artificial intelligence in education," *Educ. Inf. Technol.*, vol. 28, no. 4, pp. 4221–4241, 2023, doi: 10.1007/s10639-022-11316-w.
20. H. Zhang, I. Lee, S. Ali, D. DiPaola, Y. Cheng, and C. Breazeal, "Integrating ethics and career futures with technical learning to promote AI literacy for middle school students: An exploratory study," *Int. J. Artif. Intell. Educ.*, pp. 1–35, 2022.
21. Y. Mao and K. Shi-Kupfer, "Online public discourse on artificial intelligence and ethics in China: context, content, and implications," *AI Soc.*, vol. 38, no. 1, pp. 373–389, 2023, doi: 10.1007/s00146-021-01309-7.
22. M. Farisco, K. Evers, and A. Salles, "On the Contribution of neuroethics to the ethics and regulation of Artificial intelligence," *Neuroethics*. Springer, 2022. doi: 10.1007/s12152-022-09484-0.
23. Dignum, Virginia. The role and challenges of education for responsible AI. London Review of Education. 2021. Vol. 19(1). DOI: 10.14324/LRE.19.1.01