

Artificial Intelligence, Ethics, Academic and Research Integrity in Higher Education: A Bibliometric Analysis

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Abstract. Artificial intelligence (AI) offers considerable benefits to higher education, yet its adoption raises persistent concerns about ethics and academic and research integrity. Few studies have mapped this intersection bibliometrically. This study, therefore, analysed 213 journal articles published between 2015 and 2025 and indexed in Scopus and Web of Science, with record selection reported in accordance with PRISMA 2020. VOSviewer was used to examine publication trends, leading sources, highly cited studies, productive countries, keyword co-occurrence and the temporal evolution of themes. Output was negligible before 2023 and grew sharply thereafter. The United States, China and the United Kingdom led production, whereas African contributions remained limited. Of the 845 harmonised keywords, 20 met a minimum occurrence threshold of six (6) and formed four (4) interconnected clusters: AI research ethics and privacy; responsible generative AI and literacy; AI and academic integrity; and AI-enabled teaching and educational technology. Recent scholarship has shifted towards generative AI, AI literacy and educational technology, while research integrity remains under-examined relative to academic integrity. The findings underscore the need for institutional AI governance frameworks, AI-literacy development, and more empirical and African-led research.

Keywords: Artificial intelligence; Higher education; AI ethics; Academic integrity; Research integrity; Bibliometric analysis; VOSviewer

1. INTRODUCTION

The adoption of Artificial Intelligence (AI) in higher education has become a subject of many academic debates. AI systems are rapidly influencing institutional decision-making, instructional practices, research processes, and knowledge generation, rather than serving only as computational tools [1, 2]. The use of Large Language Models (LLMs) has enabled personalised learning, research support, content creation, inter alia, in higher education [3, 4]. Consequently, there have been improvements in knowledge sharing, educational quality and research outputs. For instance, ChatGPT has emerged as a top task guide, online course transcriber, and creator of multilingual educational resources [1, 3]. Advances in AI have enabled informed decision-making, process automation, and predictive analytics for student performance [5]. Moreover, AI reduces the time load on instructors and students by providing intelligent tutoring tools, automated assessment, and the creation of instructional materials through a dynamic approach [6].

Nevertheless, the use of AI has raised ethical challenges related to authorship integrity, academic misconduct, privacy, transparency, bias and responsible AI use, inter alia [7, 8]. These concerns have escalated significantly, considering that AI technologies have challenged conventional conceptions of academic integrity and responsible research conduct in scholarly publishing, learning, teaching and assessment [9, 10]. Moreover, there have been challenges in establishing laws and policies to protect user privacy and information [5]. There has been a lack of regulations to curb AI-related challenges across institutions [6, 8]. This has led to efforts in improving ethical and governance issues regarding AI use. Moreover, to promote the ethical implementation of AI, universities worldwide have been making ongoing efforts to revamp assessment processes, develop institutional AI policies, strengthen disclosure requirements, and promote AI literacy [3, 11].

This study addresses related but distinct concepts, including AI ethics, research ethics, research integrity, publication ethics, and academic integrity, which are often used interchangeably. As shown in Table 1, AI ethics centres on values such as fairness, accountability, transparency, privacy, and human oversight. It focuses on the responsible design, development, implementation, and governance of AI systems [2, 12]. Research ethics covers ethical behaviours when conducting research involving humans, sensitive

data, and animals. Research integrity emphasises commitment to conducting thorough, open, responsible, and repeatable research [13]. Publication ethics govern responsible scholarly dissemination through appropriate authorship, peer review, prevention of plagiarism, and editorial conduct. Academic integrity is characterised by commitment to honesty, fairness and accountability in academic work. [14, 15].

Table 1. Conceptual distinctions between related terms of the research topic

Concept	Definition/Focus	Typical Issues	Application for Higher Education	Sources
AI Ethics	Deals with values that direct the moral advancement and application of AI.	Bias, privacy, explainability, autonomy, and governance.	Ensures that ethical behaviours are applied in research, teaching, learning, and institutional decision-making.	[2, 12, 16]
Research Ethics	Covers ethical behaviours when conducting research involving humans, sensitive data, and animals	Consent, confidentiality, participant protection, ethics approval, and data collection.	Ensures conformity to ethical standards regarding personnel, students, and institutional data.	[13, 17]
Research Integrity	Commitment to conducting thorough, open, responsible, and repeatable research.	Plagiarism, fabrication, reproducibility, transparency, and appropriate use of AI.	Promotes trustworthy research practices and responsible AI use throughout the research lifecycle.	[8, 13, 18]
Publication Ethics	Characterised by standards governing responsible authorship, peer	Authorship, plagiarism, conflicts of interest, peer	Supports responsible and transparent AI-	[17, 19]

Concept	Definition/Focus	Typical Issues	Application for Higher Education	Sources
	review, editorial practices, and scholarly dissemination.	review, and AI-generated manuscripts.	assisted academic publishing.	
Academic Integrity	Commitment to honesty, fairness and accountability in academic work.	Academic dishonesty, cheating, contract cheating, plagiarism, and unapproved AI use.	Promotes responsible AI use, valid assessment, ethical learning, and institutional trust.	[9, 14, 15]

The body of knowledge on AI in education is increasingly growing. However, most research focuses on specific facets of AI adoption, such as algorithmic fairness, AI literacy, educational technology, or academic misbehaviour, but does not fully capture how these domains interact [20, 21]. Additionally, only a small number of studies have used bibliometric techniques to investigate the intellectual structure, thematic evolution, influential contributors, and emerging research frontiers at the intersection of AI, ethics, academic and research integrity, and higher education. This is despite the fact that systematic and narrative reviews have synthesised some aspects of AI in education. Unlike traditional literature reviews, bibliometric analysis provides a broad understanding of the growth of an interdisciplinary research domain [22, 23].

Therefore, this study conducts a bibliometric analysis of publications indexed in Scopus and Web of Science between 2015 and 2025 on AI, ethics, academic and research integrity in higher education. To achieve this aim, the study addresses the following research questions:

- 1) RQ1: What are the publication trends, influential publication sources, leading countries, and highly cited studies in research on AI, ethics, academic and research integrity within higher education?

- 2) RQ2: What are the primary focus areas and thematic relationships that characterise research on AI, ethics, academic and research integrity in higher education?
- 3) RQ3: How has research in this field evolved, and what emerging themes are shaping the future direction of scholarship?

Therefore, this study makes three main contributions to the body of knowledge, as evidenced by publications indexed in Scopus and Web of Science from 2015 to 2025. Firstly, it presents a bibliometric mapping of the research topic, thereby providing the publication trends, influential publication sources, leading countries, and highly cited studies (RQ1). Secondly, it describes the intellectual structure/primary focus areas and thematic relationships regarding the field of study (RQ2). Thirdly, it elucidates how the research landscape has evolved and which emerging themes are shaping future scholarship in the field (RQ3).

2. LITERATURE REVIEW

2.1. Artificial Intelligence, Ethics, Academic and Research Integrity in Higher Education

Artificial intelligence is at the centre of discussion regarding ethics, academic and research integrity in higher education. Considerations regarding fairness, responsibility, transparency, privacy, explainability, and human oversight have emerged in the development and usage of AI technologies in educational settings [16, 21]. Academic and research integrity have become increasingly important in the AI era. Conventionally, these concepts have prioritised honesty, rigour, transparency and accountability in academic works and manuscript preparation [13, 14]. Therefore, modern research increasingly conceptualises AI as a socio-technical system whose outcomes are impacted by human values, organisational practices, institutional rules, and regulatory frameworks, rather than merely as a technological tool [2, 12]. Besides, there have been ethical concerns regarding authorship, originality, disclosure, inter alia, in pedagogy-related approaches, the preparation of research manuscripts, and academic publishing [24, 25]. Hence, there is a need to promote responsible AI use, ethical learning, and institutional trust [9, 15]. Consequently, these closely related concepts necessitate governance frameworks that simultaneously stimulate innovation and maintain academic validity.

2.2. Generative AI and the Transformation of Scholarly and Educational Practices

Generative AI has been shown to actively contribute to knowledge creation across many domains, including text generation, programming support, literature synthesis, translation, administrative and instructional activities, inter alia [1, 10]. This ability has significantly changed how researchers, instructors, and students interact with data and generate academic work. For instance, AI-based platforms such as ChatGPT and Magic School have grown in popularity among educators for their usefulness in lesson preparation and the creation of educational materials [5, 26]. According to a research study, adaptive learning systems can modify the pace and content of instruction to meet each student's needs, providing more individualised and potentially fairer learning experiences [27]. Similarly, tools such as DALL-E and Gemini help produce graphic content and literature reviews, respectively [5, 28]. Another study further affirmed that AI-driven tools facilitate scientific production by automating tasks such as data processing, text editing, and literature analysis [29]. This improves research productivity and frees up more time for academics and students to engage in critical and creative thinking. Furthermore, AI has been shown to help bridge language barriers, foster inclusivity and diversity, and enable access to trustworthy educational resources [30, 31].

Despite these prospects, AI is still mostly used in supplemental ways and is not fully integrated into instructional practice [5, 32]. As a result, this partial acceptance has occasionally led to flawed academic material and significant pedagogical and ethical challenges [5]. According to a study, AI's reliability is constrained by its tendency to produce false citations [33]. Despite its potential, it cannot replace the creativity and critical insight that characterise scientific research [5]. The following section discusses AI ethical challenges in more detail.

2.3. Ethical Challenges of AI in Educational Contexts

Ethical deliberations have become a major issue in scholarly debates on the integration and regulation of AI in higher education institutions, particularly regarding the maintenance of the integrity and credibility of academic practice. Academic integrity is one of the most frequently discussed topics. Generative AI has radically reshaped conventional ideas of authorship, originality, and independent learning [1, 9]. It has been argued that generative AI can jeopardise academic integrity in assessment by encouraging plagiarism and reducing opportunities for the development of critical

thinking [34, 35]. Unlike traditional plagiarism, AI-assisted content creation poses additional difficulties for educational institutions because it can be challenging to distinguish between academic misbehaviour and legitimate learning support. To support responsible AI use while upholding academic norms, institutions are progressively updating assessment procedures, disclosure requirements, and institutional policies [3, 15].

Another critical issue includes data privacy and ethical governance. This is because AI systems increasingly depend on vast amounts of student, institutional, and research data for data processing to enhance institutional decision-making *inter alia* [20]. Hence, confidentiality, information privacy, and open governance frameworks are important to ensure responsible data handling while safeguarding human rights and institutional confidence [2, 6, 36].

Besides, algorithmic bias, lack of fairness, and a lack of explainability create additional ethical challenges in AI adoption. Inequalities in student evaluation, admissions, resource allocation, and learning support may be accidentally reinforced by AI systems trained on incomplete or biased datasets [37, 38]. Similarly, the opacity of AI makes it impossible for scholars and academics to grasp the procedures underlying most of the suggestions and conclusions produced by such models. This challenge has resulted in decreased transparency and accountability. Thus, it is essential to adopt trustworthy AI principles that promote justice and fairness, enable explainability, and support human monitoring to tackle these issues [12, 16].

Moreover, research integrity has become a major challenge, given the implications of AI use. AI models are useful at almost every stage of preparing research manuscripts and publications [10, 24]. Although its use may improve research efficiency and productivity, it raises concerns about reproducibility, disclosure of use, and scholarly accountability, *inter alia*. Consequently, several institutions and publishers have sought to impose limits on AI-assisted research and publications to preserve the integrity of scientific knowledge [16, 19].

Moreover, low levels of AI literacy among students and academics have been associated with uncritical or irresponsible use of AI. A study suggested that responsible AI use

requires competencies in both the use of artificial intelligence (AI) tools and in critical analysis and ethical reasoning [39]. Therefore, AI literacy promotes informed and moral engagement with AI-assisted learning and research while preparing students, educators, and researchers to comprehend both the potential and constraints of AI technologies. Notably, higher institutions have begun to incorporate AI literacy into their curricula and professional development programs [20, 21].

2.4. Bibliometric Studies on Artificial Intelligence, Ethics, and Higher Education

A growing number of bibliometric studies aimed at mapping the intellectual evolution of the field have coincided with the rapid rise of AI-related scholarship. AI applications in education [40], the digital revolution in education [41], AI in African higher education [42], and AI-related educational technologies [43] are just a few of the themes addressed in earlier bibliometric and systematic studies. Knowledge of publication trends, collaborative networks, key contributors, and emerging research issues has greatly improved as a result of these investigations.

Despite these developments, the majority of bibliometric research to date has focused on specific facets of AI, such as machine learning, digital transformation, educational technology, and responsible AI. Examining the convergence of AI ethics, academic and research integrity, and higher education as a cohesive, multidisciplinary field of study has received relatively little attention. As a result, there remains a lack of understanding of the recent publication trends, thematic relationships, and new focus areas that connect these related ideas. This study, therefore, fills these gaps.

3. METHODS

3.1. Research Design

To methodically identify the primary areas of interest and new topics in publications on artificial intelligence (AI), ethics, and academic and research integrity in higher education, this study employed a quantitative bibliometric approach. By measuring publication information and examining keyword co-occurrence patterns, this method is advantageous for synthesising a larger amount of data [22, 23]. This, therefore, offers a suitable methodological framework for understanding how ethical discourse on AI and academic and research integrity has progressed in higher education. The reporting of

record selection follows the PRISMA 2020 statement [44], adapted to bibliometric reviews in line with the BIBLIO reporting guideline [45].

3.2. Data Sources and Search Strategy

Scopus and Web of Science databases were employed for this study. The aim was to ensure extensive data coverage because they are widely recognised databases, and most high-quality peer-reviewed publications are indexed in them [46, 47]. The literature search was conducted on 2 April 2026. Searches were performed using the TITLE-ABS-KEY field in Scopus and the Topic Search (TS) field in Web of Science. Identical search keywords, combined into four Boolean blocks, were used in both Scopus and Web of Science, ("artificial intelligence" OR "AI" OR "machine learning" OR "deep learning" OR "intelligent systems") AND ("research integrity" OR "scientific integrity" OR "research ethics" OR "publication ethics" OR "research misconduct" OR "research fraud" OR "scientific fraud" OR "responsible research" OR "academic integrity" OR "academic misconduct") AND ("education" OR "higher education" OR "academia" OR "universities") AND ("AI ethics" OR "ethical AI" OR "responsible AI" OR "algorithmic bias"). Full records, including author keywords, indexed keywords, source and citation data, were exported from both databases for the bibliometric mapping.

Even though the search query did not specifically include emerging terms such as ChatGPT, generative AI, large language models (LLMs), and AI-assisted writing, these technologies are subdomains of artificial intelligence. These terms are typically indexed under the more general AI terminology used in this study. The fact that these terms predominated in the findings of the keyword co-occurrence analysis further supported this judgment. In addition, the explicit inclusion of these terms could have biased the analysis toward recent articles and perhaps reduced comparability of publication patterns over the 2015–2025 study period, as they only became popular after 2022. The search strategy privileged conceptual consistency and longitudinal coverage to capture the evolution of ethical AI scholarship in higher education.

3.3. Inclusion and Exclusion Criteria

Only relevant journal articles published between 2015 and 2025 were considered in this analysis. Later research (2026), however, is mentioned only for context and discussion. Journal papers were chosen for their reputation as trustworthy sources of information,

rigorous research, and stringent peer review [48]. Publications written in languages other than English were excluded. English's predominance in international publications, its benefits in indexing and citation, and its research accessibility led to the decision to use it exclusively [49]. These criteria (document type, publication years, and language) were applied as filters in each database during the search stage.

3.4. Data Screening and Preparation

The identification, screening and inclusion of records are summarised in the PRISMA 2020 Flow diagram in Figure 1 [44]. The initial search identified 525 records (Scopus, $n = 299$; Web of Science, $n = 226$). Before screening, 244 records were removed by the database filters described in Section 3.3 (Scopus, $n = 169$; Web of Science, $n = 75$); in line with PRISMA 2020, these records are reported as ineligible due to automated filtering. The remaining 281 records (Scopus, $n = 130$; Web of Science, $n = 151$) were exported and merged in Microsoft Excel, and 68 duplicate records were removed by matching DOIs (where available) and article titles. The 213 unique records were then screened and assessed against the inclusion criteria; no further records were excluded, and no full-text retrieval was required because the analysis relies on bibliographic metadata. Consequently, 213 journal articles were included in the bibliometric analysis.

3.5 Bibliometric Analysis

This study used VOSviewer version 1.6.20, a widely used software tool for bibliometric analysis, to analyse publication trends, publication sources, citation performance, country productivity, and keyword co-occurrence networks [50]. Performance analysis (publication trends, sources, highly cited studies and countries) was used to answer RQ1, keyword co-occurrence analysis was used to answer RQ2, and an overlay visualisation of the average publication year of keywords was used to answer RQ3. All keywords (author and indexed) were subjected to keyword co-occurrence analysis using the full counting approach. Since no manual changes were made to the VOSviewer settings, the association strength normalisation method [51] and the default clustering resolution parameter (1.00) were kept. A minimum occurrence threshold of six was used to improve the co-occurrence network's interpretability and reduce noise from infrequently occurring phrases. The threshold was chosen to strike a compromise between comprehensiveness and clarity by keeping the most common and closely related keywords while eliminating isolated or rarely occurring terms that made minimal contributions to the network's

conceptual structure [22, 52, 53]. Similarly, a clean keyword occurrence dataset was created by combining similar terms using the VOSviewer thesaurus file.

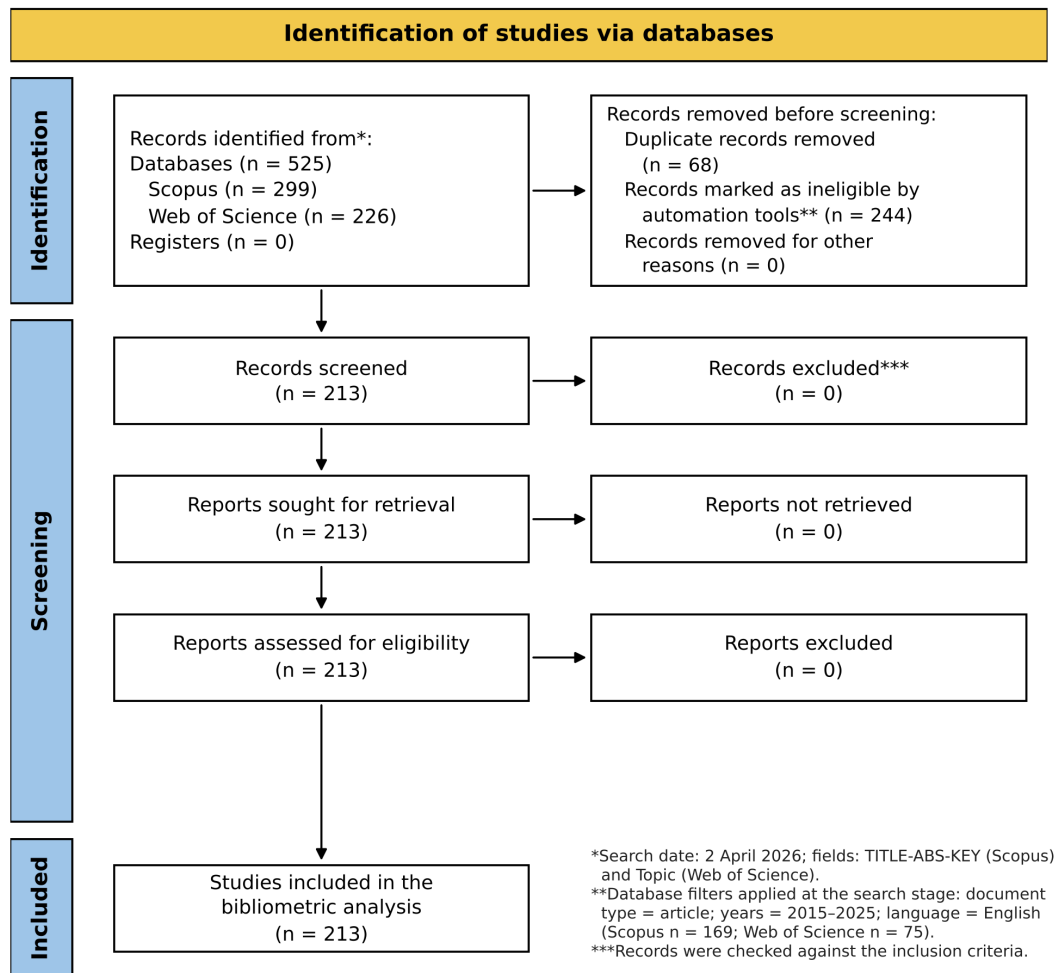


Figure 1. PRISMA 2020 flow diagram of record identification, screening and inclusion (adapted from Page et al. [44]).

4. RESULTS AND DISCUSSION

The results are presented in the order of the research questions. Sections 4.1 to 4.4 address RQ1 through a performance analysis, Section 4.5 addresses RQ2 through keyword co-occurrence analysis, and Section 4.6 addresses RQ3 through an overlay visualisation. Section 4.7 then discusses the findings, their implications, and limitations.

4.1. Annual Publication from 2015 to 2025 (RQ1)

The annual publishing trends on the research topic from 2015 to 2025 are shown in Figure 2. Before merging and de-duplication, publication numbers from Scopus and Web of Science are shown individually to demonstrate database coverage (Scopus, $n = 130$; Web of Science, $n = 151$). Figure 2 shows very scanty or no research publications from 2015 to 2022, but the number increased rapidly from 2023 onwards. Specifically, no publication was recorded in Scopus from 2015 to 2020 and in 2022. Similarly, no publications were recorded in Web of Science in 2015, 2016, and 2018. However, 2025 recorded the highest numbers of publications in Scopus and Web of Science, with 103 and 73, respectively. These findings validate the recent growing academic interest in AI, ethics, academic and research integrity-related topics in education. The findings also align with previous studies that report a noticeable increase in AI-related research publications after 2022 [3, 31]. Generally, the findings suggest that, particularly in recent years, academics have become increasingly aware of the opportunities and challenges posed by AI-enabled learning environments.

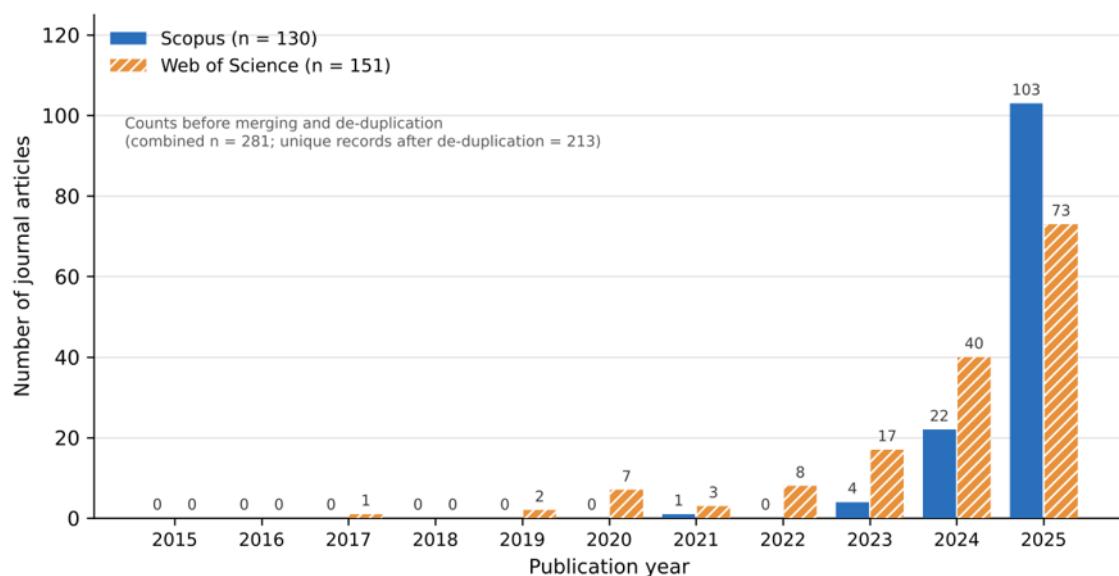


Figure 2. Annual number of journal articles retrieved from Scopus and Web of Science, 2015–2025 (before merging and de-duplication)

4.2. Leading Publication Sources (RQ1)

The number of documents extracted from each source was assessed. Results indicate that 213 journal articles from 172 sources comprised the final dataset after combining

the two databases, with 68 duplicate records removed. The extensive range of publications demonstrates the study's transdisciplinary Nature across multiple domains. A minimum threshold of three publications was used to identify the most productive sources. Table 2 lists the seven sources that satisfied this requirement. With seven articles, the *Journal of Academic Ethics* came in first, followed by *Education and Information Technologies* with five. These were followed by *Environment and Social Psychology* and *Learned Publishing*, each of which published four articles. The remaining sources had three publications each, namely the *Journal of Library Administration*, *Teaching and Learning in Nursing*, and *TechTrends*.

The top-ranking journals, such as the *Journal of Academic Ethics* and *Learned Publishing*, underscore the growing scholarly focus on AI, ethics, academic and research integrity-related topics. Furthermore, the rankings of *Education and Information Technologies* and *TechTrends* confirm the rise in research on AI integration in teaching, learning, and educational technology. Overall, the results in Table 2 indicate that, beyond computer science, ethical AI is emerging as a major field of study in academic communication, education, and information systems.

Table 2. Leading publication sources (minimum of three articles)

Source	Document	Scopus Citation Count	WoS Citation Count
Journal of Academic Ethics	7	90	77
Education and Information Technologies	5	72	594
Environment and Social Psychology	4	35	-
Learned Publishing	4	-	83
Journal of Library Administration	3	-	37
Teaching and Learning in Nursing	3	-	4
Tech Trends	3	7	4

Note: – indicates that no record from the source was retrieved from that database for the dataset. Citation counts were recorded on 2 April 2026.

4.3. Most Influential Publications (RQ1)

Table 3 presents the top-cited articles identified in the merged Scopus and Web of Science dataset. Eleven highly cited papers that have significantly advanced AI ethics and academic and research integrity in higher education research were extracted by applying a citation threshold of 100. These works serve as the field's intellectual cornerstones and have had a significant influence on later scholarly discussions.

The study titled "Can ChatGPT be an author? A study of artificial intelligence authorship policies in top academic journals" was the most frequently cited article with 461 citations [19]. The study titled "Ethical principles for artificial intelligence in education," with 441 citations [54], and the other, titled "In AI We Trust: Ethics, Artificial Intelligence, and Reliability," with 300 citations [55], came next. The top ranking of these studies shows the growing influence of research on ethical principles, authorship, responsible AI governance, and institutional responses to generative AI in higher education.

Likewise, most of the studies (nine) were qualitative, suggesting the need for more empirical research. Only two studies incorporated empirical data: a web-mining and machine-learning study of ChatGPT in education [56] and a syllabus analysis combined with a classroom pilot study [57]. These findings indicate that popular studies on AI, ethics, and academic and research integrity have been normative and conceptual, suggesting that AI remains a fluid and developing concept. Nevertheless, more empirical studies are required to assess the efficacy of AI adoption.

Table 3. Most influential publications (citation threshold of 100)

Study	Title	Citation	Method	Research Design	Analysis Technique
[19]	"Can ChatGPT be an author? A study of artificial intelligence authorship policies in top academic journals"	461	Qualitative	Document analysis	Content analysis
[54]	"Ethical principles for artificial intelligence in education"	441	Qualitative	Policy Review	Thematic analysis

Study	Title	Citation	Method	Research Design	Analysis Technique
[55]	"In AI we trust: ethics, artificial intelligence, and reliability"	300	Qualitative	Conceptual / Philosophical	Critical / argumentative analysis
[58]	"Artificial intelligence (AI) ethics: ethics of AI and ethical AI"	256	Qualitative	Narrative Review	Descriptive analysis
[59]	"Good proctor or "big brother"? Ethics of online exam supervision technologies"	146	Qualitative	Ethical Case Study	Normative analysis
[60]	"Artificial intelligence ethics guidelines for developers and users: clarifying their content and normative implications"	141	Qualitative	Structured Review	Comparative / normative analysis
[56]	"Exploring the impact of ChatGPT on education: A web mining and machine learning approach"	139	Mixed-methods (Quantitative + AI)	Empirical (Computational)	NLP + Machine Learning
[61]	"The ethical implications of using generative chatbots in higher education"	138	Qualitative	Conceptual/ Commentary	Descriptive / ethical analysis
[62]	"Ethical principles in machine learning and artificial intelligence: cases from the field and possible ways forward"	134	Qualitative	Conceptual + Case Illustration	Analytical discussion
[57]	"Integrating ethics within machine learning courses"	116	Multi-method	Syllabus analysis + literature-derived framework + pilot study	Literature review + basic empirical analysis

Study	Title	Citation	Method	Research Design	Analysis Technique
[63]	"Ethical considerations in artificial intelligence courses"	104	Qualitative	Case-based/Conceptual	Descriptive analysis

4.4. Top Publishing Countries (RQ1)

To extract the top publishing countries, a threshold of five publications was applied, resulting in 16 countries. The United States topped the ranking with 38 documents and 1414 citations. China was ranked second (19 documents, 735 citations), followed by the UK (12 documents, 646 citations), Australia (10 documents, 333 citations), and Canada (10 documents, 132 citations), which together made up the top five. Except for Canada, these nations also showed strong citation performance, suggesting that they are at the forefront of the field's intellectual advancement. However, India and Sweden, with fewer publications than the top five, had the highest citation-to-publication ratios, as shown in Table 4. This implies that a small number of highly cited articles from these countries carry considerable influence in the research topic. Conversely, nations such as Malaysia, Indonesia, and the Philippines had lower citation-to-publication ratios, indicative of ongoing growth in AI, ethics, academic and research integrity research in developing countries.

Geographical distribution also emphasises differences in research participation. The majority of scientific output comes from North America, Europe, and some regions of Asia; contributions from Africa remain rather small. As the only African country to meet the threshold, South Africa has shown growing interest in higher education research and AI ethics. However, the relatively low research output in many developing regions suggests opportunities for further international cooperation and capacity building to support more inclusive, representative scholarship.

Table 4. Country productivity and citation-to-publication ratio

Country	Number of Publications	Total Citations	Average citation per document	Rank
India	7	696	99.4	1
Sweden	7	546	78.0	2

Country	Number of Publications	Total Citations	Average citation per document	Rank
UK	12	646	53.8	3
China	19	735	38.7	4
USA	38	1414	37.2	5
Spain	8	270	33.8	6
Germany	6	200	33.3	7
Australia	10	333	33.3	7
Saudi Arabia	5	106	21.2	9
South Africa	5	86	17.2	10
Canada	10	132	13.2	11
Oman	5	51	10.2	12
UAE	5	45	9.0	13
Philippines	8	61	7.6	14
Indonesia	5	30	6.0	15
Malaysia	6	22	3.7	16

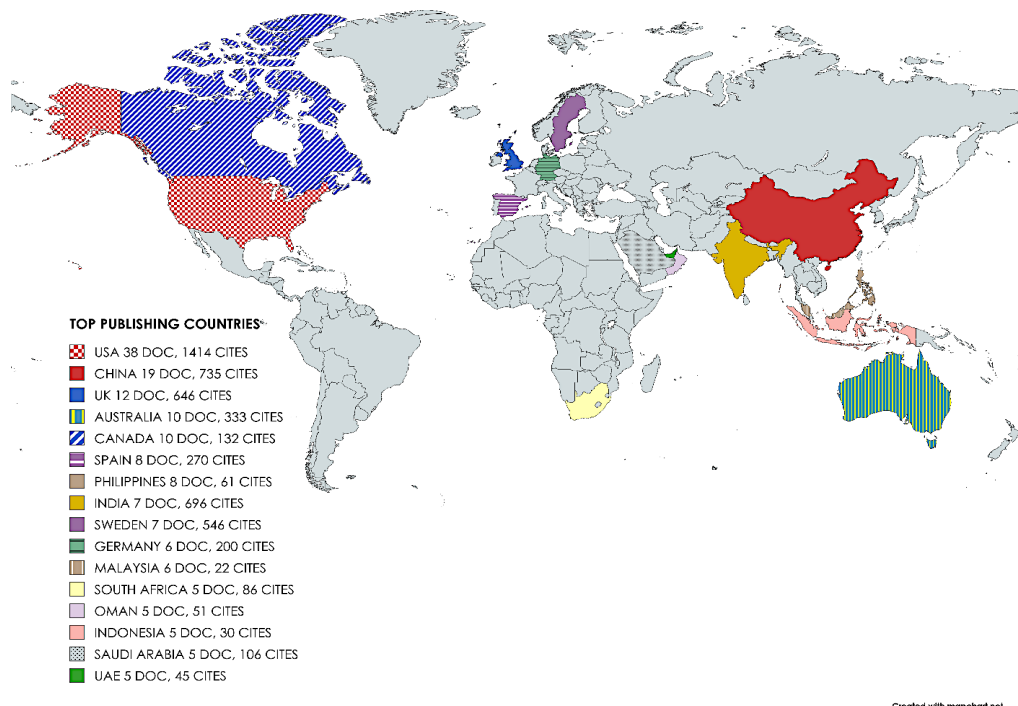


Figure 3. Top publishing countries

4.5. Keyword Co-occurrence Analysis (RQ2)

The dataset was subjected to keyword co-occurrence analysis to investigate the research focus on AI, ethics, and academic research integrity in higher education. Results indicate 845 keywords from the 213 extracted publications after harmonising the keywords with a VOSviewer thesaurus file to merge equivalent/duplicate terms. To properly cluster keywords into themes, a minimum occurrence threshold of six was employed, resulting in 20 keywords. Hence, the retained keywords revealed four clusters as shown in Table 5. Similarly, Figure 4 shows the network visualisation map for the four clusters. Notably, the higher the co-occurrence of the keywords, the closer they are to each other [64].

Table 5. Clusters of co-occurring keywords

Cluster/Theme Name	Keywords	Occurrence	Total Link
Cluster 1: AI Research Ethics and Privacy	artificial intelligence	106	199
	ethics	25	55
	education	15	47
	research ethics	12	28
	human	9	27
	privacy	8	19
	data privacy	7	27
	Total	182	402
Cluster 2: Responsible Generative AI and Literacy	generative artificial intelligence	49	134
	ai ethics	35	76
	ai literacy	15	36
	students	12	41
	ethical technology	6	25
	research integrity	6	10
	Total	123	322
Cluster 3: AI and Academic Integrity	academic integrity	65	142
	higher education	53	130
	chatgpt	39	89
	plagiarism	7	17
	Total	164	378

Cluster/Theme Name	Keywords	Occurrence	Total Link
Cluster 4: AI-Enabled	ai in education	10	29
Teaching and Educational	educational technology	9	39
Technology	teaching	8	44
	Total	27	112

4.5.1 Cluster 1: AI Research Ethics and Privacy

This cluster, represented in red, comprises artificial intelligence, ethics, education, research ethics, human, privacy, and data privacy. Artificial intelligence had the highest occurrence, confirming its prevalence in the research topic and high connectivity to other keywords. Privacy and data privacy were also notable in this cluster by their frequency, indicating their significance to the research topic. For instance, studies have highlighted issues with data privacy, algorithmic bias, and lack of transparency, among others, regarding AI adoption [5, 65]. Hence, data protection and informed consent are emphasised as ethical priorities [66]. Additionally, a research study highlighted concerns regarding critical thinking, assessment fairness, and the preservation of human-centred pedagogy [31]. Furthermore, another study affirms that the successful integration of AI ethics in higher education requires a governing framework to ensure the responsible use of AI [65].

4.5.2 Cluster 2: Responsible Generative AI and Literacy

This cluster, represented in green, comprises generative artificial intelligence, AI ethics, AI literacy, students, ethical technology, and research integrity. With generative AI having the highest frequency (49) and TLS (134) in this cluster, this underscores the growing scholarly concern about the responsible use of generative AI in higher education. The accompanying keywords, such as AI ethics and AI literacy, further underscore the emerging need for technical and ethical education among students and teachers, as well as for upskilling to use generative AI responsibly without compromising research integrity [67, 68]. According to a research study, students should use their knowledge and judgement to double-check AI-generated content to guard against bias, hallucinations, and misleading information [69]. Similarly, several authors advocate establishing educational programs and guidelines to improve AI literacy and ethical awareness, ensuring that stakeholders navigate the opportunities and risks associated with AI appropriately [67, 70].

4.5.3 Cluster 3: AI and Academic Integrity

This cluster, shown in blue, includes academic integrity, higher education, ChatGPT, and plagiarism. Academic integrity had the highest occurrence in this cluster and the second-highest frequency in the network (65 occurrences; 142 TLS). This confirms its significance in the research topic. It is strongly linked to other keywords, particularly higher education and ChatGPT, which indicates major research centred on upholding academic integrity amid the adoption of ChatGPT and related AI technologies in higher education. For example, several studies highlight that ChatGPT is widely perceived as a threat to academic integrity, raising concerns about plagiarism, contract cheating, and the authenticity of student work [56, 71, 72]. Consequently, the rapid adoption of ChatGPT has prompted universities to reconsider their assessment and integrity policies [71, 72]. Furthermore, the development of guidelines, frameworks, and policies for AI-related technologies has been encouraged not only at the institutional level but also at the governmental level in more recent studies [73, 74].

4.5.4 Cluster: AI-Enabled Teaching and Educational Technology

Represented in yellow, this cluster comprises AI in education, educational technology, and teaching. The occurrence and TLS of the keywords demonstrate a distinct line of research probing AI inclusion into teaching and educational technologies. Despite the challenges surrounding the use of AI technologies, they have been acknowledged as beneficial for personalised and adaptive learning, as well as for tailored feedback, thereby improving student engagement and learning outcomes [75, 76]. In other words, diverse learners' needs are accommodated, improving inclusivity. Similarly, AI technologies have positively transformed teaching by automating administrative tasks, supporting content creation, and enabling the prioritisation of mentorship and creativity [77, 78]. In other words, faculties are prioritising facilitation and professional development. Generally, the results of the keyword co-occurrence uncovered an interrelated conceptual structure rather than four isolated research themes. In answer to RQ2, research in this field is organised around four interconnected focus areas, with artificial intelligence and academic integrity serving as the principal hubs linking ethical, pedagogical and technological concerns.

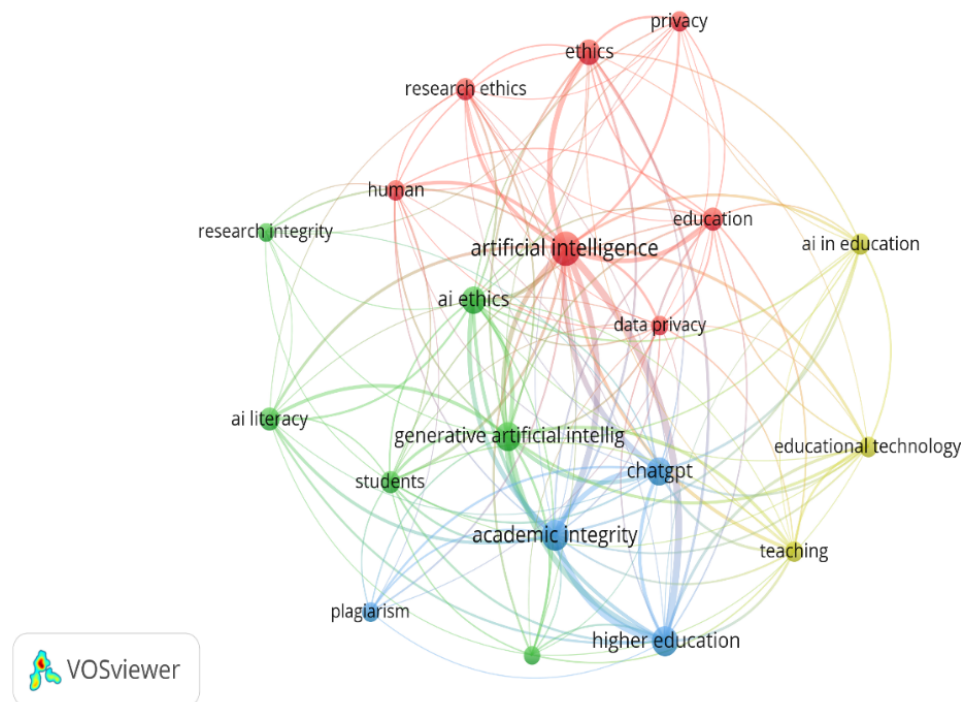


Figure 4. Network visualisation map of keyword co-occurrence (minimum occurrence = 6; 20 keywords; four clusters)

4.6. Temporal Evolution of Research and Emerging Themes: Overlay Visualisation Analysis (RQ3)

Figure 5 shows an overlay visualisation of the network map of co-occurring keywords across different publication years. With a minimum of six occurrences, the frequently occurring keywords concentrated between 2024 and 2025. Keywords evident in early 2024 include *ethics*, *privacy*, *artificial intelligence*, *education*, and *plagiarism*. Keywords in mid-2024 include *research ethics*, *AI ethics*, *data privacy*, *research integrity*, *ChatGPT*, and *AI in education*. Their positioning indicates rising interest in the subjects. The most recent areas of scholarly attention (late 2024 and 2025) are represented by keywords towards the yellow end of the overlay scale, particularly *AI literacy*, *human*, *ethical technology*, and *educational technology*. Other prominent terms, including *generative artificial intelligence*, *students*, *academic integrity*, *higher education*, and *teaching*, also exhibit relatively recent average publication years. Generally, the keywords represent a progressive focus on competencies and practical responses regarding AI, ethics, academic and research integrity in higher education [71, 72].

It is noteworthy that the significant rise in publications between 2023 and 2025 (Figure 2) should be taken into consideration when interpreting the concentration of average publication years in Figure 5 around 2024–2025. The dataset's representation of recent themes expanded due to this surge in publications, and phrases related to generative AI became more prominent in the overlay visualisation. As a result, rather than depicting a consistent chronological evolution across the entire 2015–2025 research period, the temporal evolution mostly captures shifts that occurred during the field's recent expansion. Moreover, the rise in publications from 2023 to 2025 suggests that the citation counts in this study reflect cumulative scholarly influence rather than direct indicators of the current importance of specific publications. In answer to RQ3, the field has moved from identifying ethical risks (ethics, privacy and plagiarism) towards building capabilities and human-centred responses (AI literacy, ethical technology and educational technology), which are the emerging themes most likely to shape future scholarship.

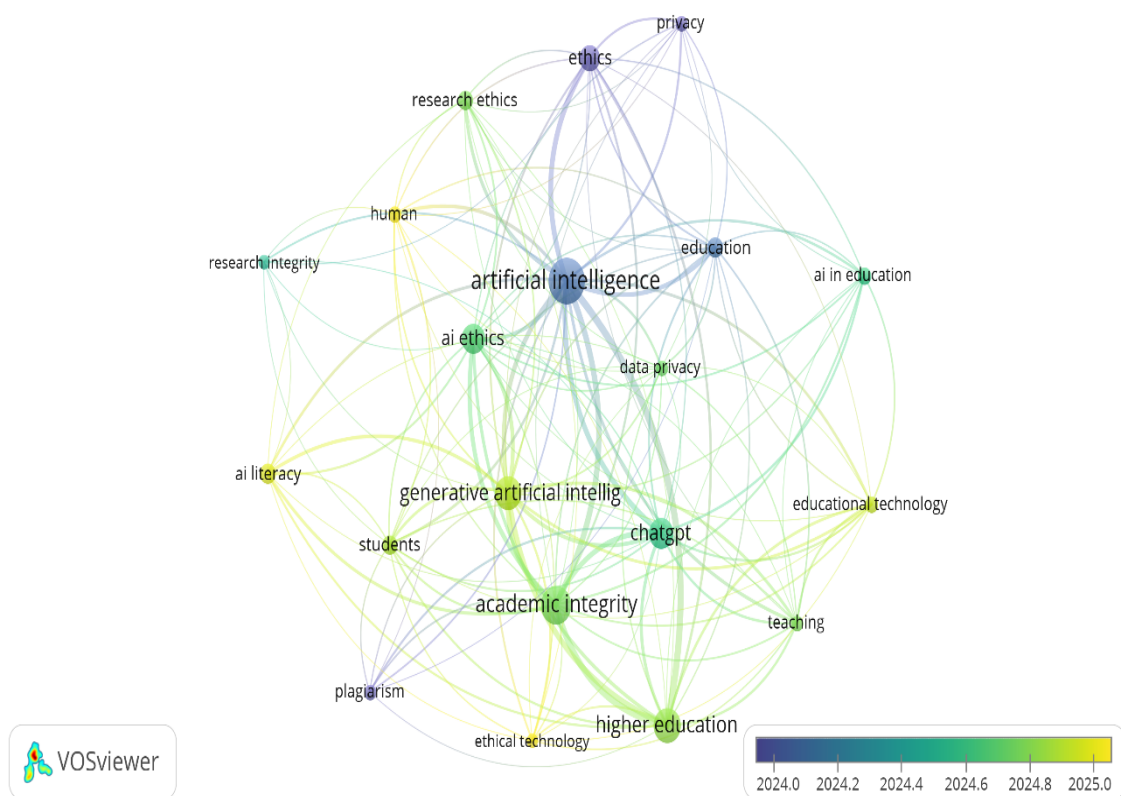


Figure 5. Overlay visualisation of keyword co-occurrence (colour indicates the average publication year of each keyword)

4.7. Discussion

4.7.1. Synthesis of Findings in Relation to the Research Questions

The performance analysis (RQ1) shows that research at the intersection of AI, ethics, and academic and research integrity in higher education is a recent and rapidly expanding field. Output was negligible until 2022 and rose sharply from 2023, a pattern consistent with the public release of ChatGPT in late 2022 and the subsequent surge in scholarly attention to generative AI [1, 3, 10]. The dispersion of 213 articles across 172 sources, with no source contributing more than seven articles, indicates that the field has not yet consolidated around a core set of journals and that it draws on ethics, educational technology, scholarly communication, library science and nursing education. The prominence of the *Journal of Academic Ethics and Learned Publishing* nevertheless shows that integrity and publication-ethics outlets have become central venues for this debate. The most-cited works are predominantly conceptual, normative or review-based (nine of eleven), suggesting that the intellectual foundations of the field rest more on principles and policy analysis than on empirical evidence of how AI is used and governed in practice. Geographically, production is concentrated in North America, Europe, and parts of Asia. At the same time, South Africa is the only African country that met the inclusion threshold, consistent with earlier evidence on the limited representation of African higher education in AI scholarship [15, 42].

The science-mapping results (RQ2) reveal four clusters that are conceptually distinct yet densely interconnected. A notable asymmetry emerges between academic and research integrity. Academic integrity, framed largely around student assessment, plagiarism and ChatGPT, is the second most frequent keyword in the network (65 occurrences). In contrast, research integrity occurs only six times and has the weakest total link strength (10). This indicates that the literature has concentrated on student misconduct and assessment security. At the same time, the implications of AI for researchers' own practices, including authorship, disclosure, reproducibility and peer review, remain comparatively under-examined, despite the policy attention these issues have received from journals and publishers [19, 24]. Furthermore, the placement of *AI ethics* (Cluster 2) apart from the more general *ethics* and *research ethics* terms (Cluster 1) suggests that discourse on the governance of AI systems and discourse on ethical research conduct are still developing in partially separate streams, which reinforces the value of the conceptual distinctions set out in Table 1.

The overlay analysis (RQ3) indicates a shift in emphasis from problem framing to capability building. Earlier keywords (*ethics, privacy* and *plagiarism*) centred on identifying risks, whereas the most recent keywords (*AI literacy, human, ethical technology* and *educational technology*) point towards human-centred responses, competence development and the design of ethically aligned tools. This trajectory mirrors calls for AI literacy that combines technical competence with critical and ethical reasoning [39, 67, 70] and for governance frameworks at institutional and governmental levels [73, 74]. Compared with an earlier systematic review of AI applications in higher education, which reported limited critical reflection on ethical challenges and risks [43], the present findings show that ethics and integrity have moved from the periphery towards the centre of the field. However, because the average publication years of the retained keywords fall within a narrow 2024-2025 window, these temporal patterns should be interpreted as short-term shifts within a rapidly expanding literature rather than as a long-term evolution.

4.7.2. Theoretical Implications

This study contributes to the body of knowledge by revealing where research on AI, ethics, and academic and research integrity within higher education has concentrated. It provides four thematic clusters that describe this domain: (a) AI Research Ethics and Privacy, (b) Responsible Generative AI and Literacy, (c) AI and Academic Integrity, and (d) AI-Enabled Teaching and Educational Technology. By integrating constructs that are often studied separately and distinguishing them conceptually (Table 1), the study provides a structured basis for theory development in this domain. The findings also map possible areas for further research, particularly in African countries, where the literature is limited, and identify research integrity as an underdeveloped theme relative to academic integrity. Furthermore, the study extends bibliometric and review-based work on AI in education [40-43] by mapping the convergence of AI, ethics, and academic and research integrity, an area that has received little attention in recent bibliometric and scientometric investigations.

4.7.3. Practical and Policy Implications

This study is beneficial to educators by highlighting trends in AI, ethics, and academic and research integrity research, as well as the primary research focus and emerging research themes, thereby advocating AI literacy and the responsible use of AI in academic

work. The study also advocates establishing institutional rules and a governance framework for the use of AI across higher education institutions, especially in developing countries where AI literacy is lagging. Besides affirming the establishment of institutional and publishing standards, it advocates compliance with them to uphold academic and research integrity. Given the identified imbalance between academic and research integrity, institutional policies should extend beyond student assessment to cover researchers' use of AI in manuscript preparation, data analysis, and peer review, including clear disclosure requirements [16, 19]. Furthermore, the study urges technology developers to incorporate features that align with ethical standards while supporting educational effectiveness and responsible innovation. Lastly, the geographic distribution of publications points to the need to promote greater involvement from underrepresented areas. Supporting research capacity and policy development in developing nations, especially in Africa and some Asian countries, would yield more inclusive and context-sensitive AI governance frameworks that respond to a range of societal and educational demands.

4.7.4. Limitations and Directions for Future Research

This study has some limitations; hence, care must be taken when generalising the findings. First, only the Scopus and Web of Science databases were used, which may have led to the omission of relevant studies. Future studies are encouraged to include other databases, such as Dimensions and OpenAlex. Second, only English-language publications were included, so that reputable non-English publications may have been neglected. Future studies may consider multilingual sources. Third, the analysis was restricted to journal articles, thereby excluding conference papers, book chapters and policy documents that form a growing part of this literature. Fourth, differences between the author and indexed keywords may affect the keyword co-occurrence analysis. Even though synonymous and variant terms were harmonised using a VOSviewer thesaurus file, some researcher judgment was involved. Fifth, although the minimum occurrence threshold improved network interpretability, less common or newly emerging topics might have been excluded. Sixth, citation counts are time-dependent, differ between Scopus and Web of Science, and were not normalised for publication age, which disadvantages recent articles. Finally, because most records were published between 2023 and 2025, the temporal analysis captures a short window of rapid growth. Future studies are therefore encouraged to integrate systematic reviews and manual thematic

validation, to conduct empirical studies on how AI policies are implemented in higher education institutions, particularly in Africa, and to examine research integrity in researchers' use of AI more directly.

5. CONCLUSIONS

This study established a research focus on artificial intelligence (AI), ethics, academic and research integrity in higher education between 2015 and 2025 using a bibliometric approach. The study used 213 journal articles that were obtained from Scopus and Web of Science. The study revealed a surge in publications in both databases from 2023 onward. Scopus showed a more noticeable growth trajectory in the latter years of the study period. In contrast, Web of Science indexed the oldest papers and demonstrated a progressive increase in research output starting in 2017. The top two-ranked journals are the *Journal of Academic Ethics* and *Education and Information Technologies*. This confirmed the focus on ethical research behaviour, academic integrity, and publication ethics, as well as the rise in research on AI integration in teaching, learning, and educational technology. Geographically, the top five publishing countries are the USA, China, the UK, Australia, and Canada, while India and Sweden have higher citation-to-publication ratios. Overall, the findings suggest a lag in participation among developing countries, especially in Africa, with South Africa as the only African country to meet the inclusion threshold. This reveals a knowledge gap that can be explored to improve responsible AI on the continent.

Moreover, the keyword co-occurrence analysis identified four interconnected thematic areas: (1) AI Research Ethics and Privacy, (2) Responsible Generative AI and Literacy, (3) AI and Academic Integrity, and (4) AI-Enabled Teaching and Educational Technology. These also provide evidence of the primary research focus of previous studies. Research integrity, however, remains markedly less developed than academic integrity, and the most influential studies are largely conceptual rather than empirical. Current research is moving towards *AI literacy*, *human*, *ethical technology*, and *educational technology*. This study, therefore, contributes to the body of knowledge by establishing bibliometric patterns and mapping the research focus on AI, ethics, and academic and research integrity, which has received little attention in recent bibliometric and scientometric investigations.

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