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The Role of Artificial Intelligence in Modern Academic Research: A Systematic Review of Contemporary Literature (2015–2025)

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ABSTRACT

Background: The rapid advancement of artificial intelligence (AI) technologies, particularly large language models (LLMs) such as ChatGPT and other AIs, has fundamentally reshaped the landscape of modern academic research, raising both opportunities and critical challenges for higher education institutions worldwide. *Aim:* This study systematically maps the contexts in which AI has been applied in modern academic research during 2015–2025 and examines how AI has influenced the process and outputs of educational research over the past decade. *Method:* A Systematic Literature Review (SLR) design was employed, guided by the PRISMA protocol and PICOC framework. A total of 5,106 articles were identified during the initial ScienceDirect database search. Following a rigorous multi-stage screening process based on predefined inclusion and exclusion criteria, 19 articles were selected for final analysis. *Results and Discussion:* The findings reveal that AI has been applied across a broad and continuously expanding range of academic contexts, including automated writing assessment, citation prediction, AI-generated instructional content, academic integrity evaluation, and AI literacy development in academic libraries, with ChatGPT and similar LLMs serving as the primary catalysts of this expansion from 2022 onward. The influence of AI on educational research processes and outputs is simultaneously accelerative and disruptive: while AI demonstrably enhances efficiency, consistency, and productivity, it also poses serious threats to assessment integrity, authorship norms, and equity of access, particularly for international students and institutions from the Global South. *Conclusion:* AI is not merely a technical tool but a transformative force that demands systemic, ethical, and pedagogical responses across the entire academic ecosystem, including assessment redesign, integrated AI literacy curricula, and the development of coherent global ethical governance frameworks for AI use in academic research.

Keywords: Artificial Intelligence, Academic Research, Systematic Literature Review, Large Language Models, Academic Integrity

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INTRODUCTION

Artificial intelligence (AI) has evolved dramatically from a specialized subfield of computer science into a transformative force that permeates nearly all areas of academic research. Bibliometric analyses indicate that AI involvement across disciplines, defined here as the proportion of research fields with at least one publication using OECD-identified AI terminology, increased from around 14% in 1960 to more than 98% in 2021 (Hajkowicz et al, 2023), with a significant surge in publication volume and citation impact occurring since 2014 (Fayda-Kinik, 2025).

This development has been driven by a series of increasingly mature AI technologies—including machine learning, deep learning, large language models (LLMs) such as ChatGPT and GPT-4, natural language processing (NLP), and explainable AI (XAI)—which now support a wide range of scientific activities, from automated data analysis, literature synthesis, and AI-assisted academic writing to adaptive intelligent tutoring systems (Alchokr et al., 2024; Celik, 2025; Villegas-Ch et al., 2025), These technologies now support a wide range of scientific activities, including automated data analysis, literature synthesis, AI-assisted academic writing, and adaptive intelligent tutoring systems. This expansion reflects a fundamental methodological shift that not only improves research efficiency but also opens new forms of cross-disciplinary knowledge production (Hajkowicz et al., 2023; Toto et al., 2025).

Despite these substantial benefits, integrating AI into academic research also poses complex ethical, methodological, and structural challenges. Algorithmic bias, threats to data privacy, and concerns about academic integrity—particularly in relation to AI-assisted writing and assessment—have become central issues for the scientific community and higher education institutions (Daoudi, 2025; Llerena-Izquierdo & Ayala-Carabajo, 2025). At the same time, growing attention has been directed to the possibility that AI may erode critical

thinking and reduce researchers' intellectual independence (Mohammadkarimi & Omar, 2025; Yavich, 2025).

Clear global disparities further compound these challengwhile developed countries such as China and the United States lead in AI research output and its integration into higher education (Crompton & Burke, 2023), institutions in the Global South continue to face structural barriers, including limited digital infrastructure, gaps in AI literacy, and culturally misaligned AI systems (Anuyah et al., 2023; Borines et al., 2024). Regulatory frameworks also remain globally fragmented, and most universities still do not have binding policies governing the use of AI in research (Loucif et al., 2025; Tabacu, 2025), Taken together, these disparities indicate that the development and governance of AI in academic research remain uneven across regions and institutions.

Various efforts have been undertaken to address these challenges, including the development of responsible human–AI collaboration frameworks such as Human-AI Symbiotic Theory (HAIST) and advances in explainable AI (XAI) aimed at improving the transparency and accountability of AI-based research processes (Kumar et al., 2023; Morello & Chick, 2025). Nevertheless, the existing literature remains marked by theoretical fragmentation, limited empirical validation of rapidly developing AI tools, and insufficient representation of perspectives from diverse global contexts (Castillo-Martínez et al., 2024; Xu & Thien, 2026). A comprehensive and cross-disciplinary systematic review of the role of AI in modern academic research is therefore still urgently needed. Based on these gaps, this study proposes two main research questions: (RQ1) In what contexts was artificial intelligence applied in modern academic research during 2015–2025? and (RQ2) How has artificial intelligence influenced the process and output of research in education over the past decade?

METHOD

This study employed a Systematic Literature Review (SLR) design to identify, review, and synthesize research findings on the role of Artificial Intelligence (AI) in modern academic research, particularly in education and higher education, during the period 2015–2025. In this study, the method section covers the research design, implementation procedures, data sources, data collection techniques, and data analysis procedures. Because the study used an SLR approach, its primary focus was not on field-based participants but on scholarly articles systematically selected as the primary data sources. Therefore, this section explains the stages of literature searching, the inclusion and exclusion criteria, the procedures for article selection, the instruments used for data extraction, and the analytical approach used to synthesize findings from the selected studies. This methodological description clearly demonstrates how the review was conducted, from the initial search process to the final synthesis of findings.

Systematic Literature Review is a method characterized by a systematic, transparent, and structured process for collecting, evaluating, and synthesizing relevant studies on a particular topic. Through this approach, researchers can develop a comprehensive understanding of a research field's development, identify patterns in existing findings, and detect research gaps that may inform future investigation. In the present study, the review process followed the main stages commonly applied in SLR research, namely: (1) formulating clear and focused research questions, (2) identifying relevant studies through selected databases, (3) screening articles based on predetermined inclusion and exclusion criteria, (4) assessing article eligibility in terms of relevance and accessibility, and (5) analyzing and synthesizing the findings of the final set of studies. To ensure transparency and rigor, the article selection process followed the PRISMA flow, documenting the identification, screening, eligibility, and inclusion stages in a systematic and accountable manner.

To guide the formulation of the review focus, this study applied the PICOC framework, comprising Population, Intervention, Comparison, Outcome, and Context. The Population refers to the subjects or groups examined in the reviewed studies; the Intervention refers to the principal phenomenon under investigation; the comparison refers to any relevant comparator, when applicable; the Outcome refers to the intended findings or effects to be identified; and the Context refers to the research setting or scope. Based on this framework, the study formulated two main research questions: (RQ1) In what contexts was Artificial Intelligence applied in modern academic research during 2015–2025? and (RQ2) How has Artificial Intelligence influenced the process and output of research, particularly in the field of education, over the past decade?

At the identification stage, the literature search was conducted using the ScienceDirect database to locate potentially relevant articles. The search string used was ("Artificial Intelligence" OR "AI") AND ("academic research" OR "scholarly research") AND ("education" OR "higher education") AND ("modern" OR "contemporary"), yielding 5,106 articles. The next step involved an initial screening based on publication year, article type, research focus, and language. Through this screening process, 136 articles were identified as meeting the preliminary criteria for further review. This stage was conducted carefully to ensure that only studies relevant to the topic and of sufficient academic quality advanced to the next stage.

At the eligibility stage, the articles were further evaluated based on full-text accessibility, title relevance, and abstract content. The results of this assessment indicated that 19 articles were eligible for in-depth analysis. At the final stage, namely inclusion, an additional selection criterion related to the study population was applied. However, no articles were excluded at this stage, so the final analysis included 19 studies. The entire selection process adhered to the PRISMA

guidelines, thereby providing a clear and systematic representation of the review procedure from identification to final inclusion, as illustrated in Figure 1.

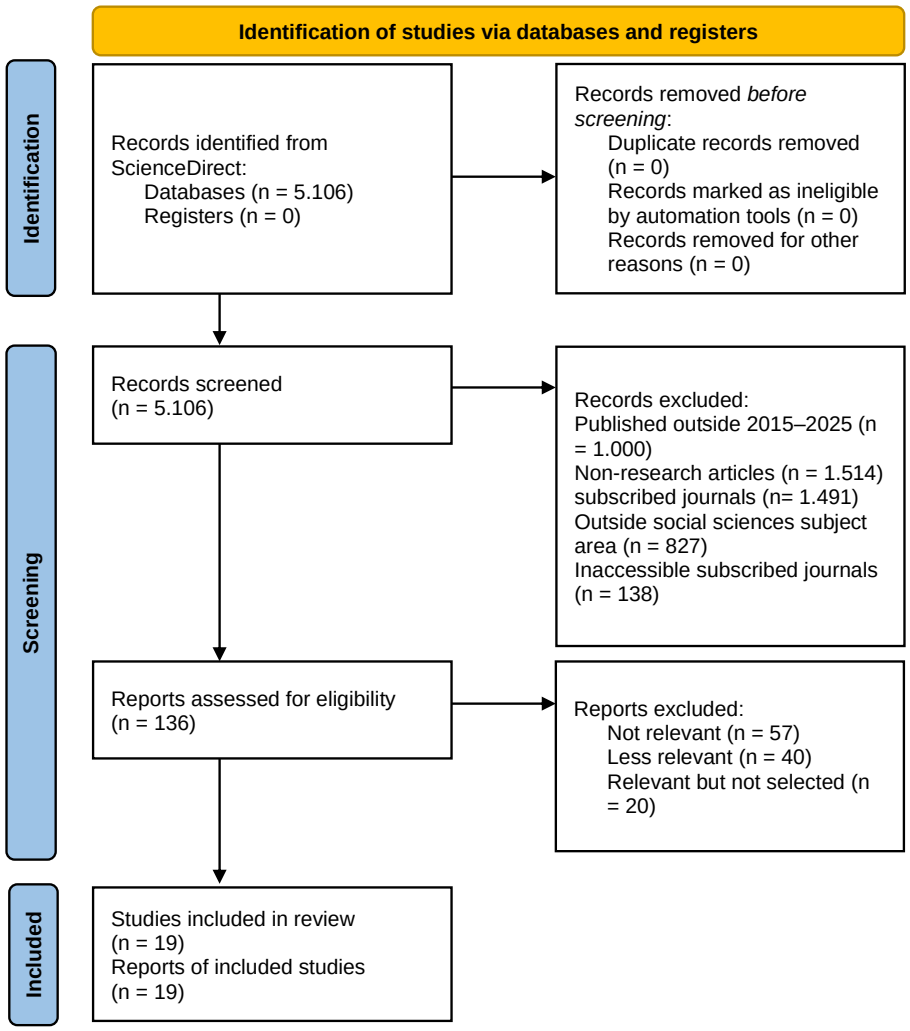

Figure 1. Diagram Alur Prisma

In the identification stage, 5,106 records were retrieved from the ScienceDirect database. After limiting the publication years to 2015–2025, 4,106 records remained. Further filtering by document type reduced the number to 2,592 research articles. Applying the open access and open archive filters narrowed the dataset to 1,101 records, and restricting the subject area to social sciences further reduced it to 274 records. After limiting the results to subscribed journals with direct full-text accessibility, 136 records were screened based on title and abstract. During the screening stage, 117 records were excluded: 57 irrelevant articles, 40 less relevant articles, and 20 relevant articles not selected. As a result, 19 studies were included in the final review.

Table 1. Inclusion and Exclusion Criteria

Component	Inclusion Criteria	Exclusion Criteria
Population	Articles focusing on researchers, academics, lecturers, students, or other members of the academic community	Articles focusing on non-academic populations without relevance to research or higher education
Intervention	Articles discussing the use or role of Artificial Intelligence (AI) in academic research	Articles that do not directly address AI or are not relevant to academic research
Comparison	Articles with or without comparison, as long as they are relevant to the research objectives	Comparative articles unrelated to AI in an academic context

Outcome	Articles reporting the impact, benefits, challenges, or implications of AI on research processes and outputs	Articles that do not explain the outcomes or implications of AI use
Context	Articles situated in education, higher education, or modern academic research contexts	Articles situated purely in non-academic contexts
Publication Year	Published between 2015 and 2025	Published outside 2015–2025
Document Type	Journal articles	Books, conference proceedings, theses, dissertations, editorials, or non-journal reports
Language	English	Languages other than English
Accessibility	Full-text articles available	Articles without full-text access

RESULTS AND DISCUSSION

Results

This results section presents the main findings of a systematic review of 19 articles selected using the PRISMA procedure from the ScienceDirect database, covering the period 2015–2025. The findings are organized around two research questions: (RQ1) in what contexts artificial intelligence (AI) has been applied in modern academic research, and (RQ2) how AI has influenced the processes and outputs of research in the field of education over the past decade.

Table II. Data Extraction

No.	Article Title	Research Objective	Research Method	Main Results/Findings
1	Assigning CEFR-J levels to English learners' writing: An approach using lexical metrics and generative AI (Uchida & Negishi, 2025)	To develop an automated scoring system (CWLA) that integrates lexical metrics and AI-based scoring to assess English learners' writing proficiency in accordance with CEFR-J levels	System development study using a regression-based CWLA model that combines lexical metrics and AI scores; validated with the ICNALE GRA dataset, entropy analysis, and expert validation based on CEFR-J.	The results showed a strong correlation of 0.88 between CWLA scores and human ratings, with score distributions closely resembling those of human assessors. Expert agreement reached 83.33%, indicating that CWLA is a reliable tool for assessing CEFR-J proficiency levels.
2	Use of ChatGPT in academia: Academic integrity hangs in the balance (Bin-Nashwan et al., 2023a)	To examine academics' and researchers' motivations for using ChatGPT and the role of academic integrity in shaping its adoption behavior.	Quantitative survey involving 702 respondents recruited from ResearchGate and Academia.edu, analyzed using structural equation modeling (SEM).	The findings showed that ChatGPT use was positively influenced by time-saving features, electronic word of mouth, academic self-efficacy, and stress. Academic integrity negatively affected usage; however, as a moderating variable, it strengthened the influence of several factors on ChatGPT adoption.
3	The future of work of academics in the age of Artificial Intelligence: State-of-the-art and a research roadmap (Renkema & Tursunbayeva, 2024)	To develop an integrated framework for exploring the future of academic work in the Context of advancing AI.	Systematic literature review, state-of-the-art analysis, and conceptual framework development based on the dimensions of academic space, time, and tasks.	The findings indicate that AI affects research, teaching, and academic service activities. The study also proposes scenarios and a research roadmap to better understand the implications of AI for the future of academic knowledge work.
4	B-Wheel – Building AI competences in academic libraries (Kautonen & Gasparini, 2024)	To introduce the B-Wheel process model as a holistic approach to building AI competence in academic libraries.	Design Thinking approach, workshops conducted in Scandinavian research libraries, and a case study in Scandinavian university libraries.	The B-Wheel model, inspired by Bauhaus school principles, was successfully implemented. Its holistic and learning-by-doing approach proved transferable across academic libraries for developing generative AI competence.
5	A survey on the current status of AI literacy lectures in China's university libraries under the AIGC background (Wu et al., 2024)	To investigate the current status of AI literacy training in Chinese university libraries (QS Top 40 and "Double First-Class" institutions) and to propose optimization strategies.	Empirical survey combining quantitative statistics and qualitative analysis through text mining, along with content analysis of AI literacy lectures.	The findings revealed several prominent problems in "Double First-Class" libraries, including low librarian participation, unbalanced training content, insufficient attention to AI ethics, and a lack of systematic curriculum design. Based on an international comparative perspective, the

				study proposed eight optimization strategies.
6	Mnemonic evaluative frameworks in scholarly publications: A cited reference analysis across disciplines and AI-mediated contexts (Tomaszewski, 2024)	To analyze citation patterns of mnemonic evaluation frameworks in cross-disciplinary scholarly literature, particularly in the Context of AI.	Cited reference analysis using the Scopus database, covering 280 journal articles, conference papers, and review articles, including a subset of 49 AI-focused documents.	The findings showed that older frameworks, such as CRAAP and CARS, received the highest citation counts, whereas SIFT and RADAR were cited more frequently in AI-related literature. Since 2022, a disciplinary shift toward Computer Science and Engineering has become evident. The study also introduced a new framework, the CAT Test.
7	Exploring the affordances of generative AI large language models for stance and engagement in academic writing (Mo & Crosthwaite, 2025)	To investigate how three large language models (LLMs) express stance and reader engagement in academic writing compared with human authors.	Corpus analysis of 30 academic essays generated by each model (ChatGPT, MetaAI, and ERNIEBot), compared with human-written texts, using stance and engagement annotation based on Hyland's (2005) taxonomy.	The findings showed that LLMs used narrower and more repetitive stance and engagement features than human writers. Significant variation was also identified across the three LLMs. In general, discipline-based usage patterns were similar to those of human writing, except in philosophy.
8	Opinion Paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy (Dwivedi et al., 2023)	To explore the opportunities, challenges, and implications of generative AI (ChatGPT) from multidisciplinary perspectives for research, practice, and policy.	Multidisciplinary opinion paper based on conceptual analysis and a review of perspectives from more than 80 scholars across fields such as management, education, health, and law.	The study found that generative AI offers substantial opportunities but also poses serious challenges related to academic integrity, privacy, bias, and trust. It highlights the need for clear institutional policies and ethical guidelines for the use of AI in research and education.
9	Citation prediction by leveraging transformers and natural language processing heuristics (Buscaldi et al., 2024)	To develop an automated methodology for predicting citation placement positions in scientific papers using a transformer architecture.	Two automated approaches were employed: (1) transformer-based mask filling and (2) named entity recognition (NER), supported by NLP heuristics and formally evaluated using the s2orc-9K dataset.	The generative approach significantly outperformed five alternative methods. Its results were not statistically different from those of three senior researchers, indicating strong potential for AI to support academic scientific writing.
10	Comparing human-made and AI-generated teaching videos: An experimental study on learning effects (Netland et al., 2024)	To compare learning effects between human-produced instructional videos and videos generated by generative AI.	Online between-subjects experimental design involving 447 participants, with two treatment conditions and measurements of learning experience and multiple-choice test performance (N = 1,788 video treatments).	Human-produced videos showed a small but statistically significant advantage in terms of learning experience. However, test results indicated comparable knowledge gains across both conditions, suggesting that AI-generated instructional videos are likely to develop rapidly in the future.
11	You don't need to prove yourself: A raciolinguistic perspective on Chinese international students' academic language anxiety and ChatGPT use (Zheng, 2025)	To examine the academic language anxiety of Chinese international students in the Context of ChatGPT use from a raciolinguistic perspective.	Qualitative study using interviews and analysis of human–AI interaction data from 18 Chinese international postgraduate students in the United States.	The findings showed that AI tools such as ChatGPT intensified linguistic insecurity and academic language anxiety among Chinese international students, even though they improved the surface quality of writing. The study also identified growing dependence on AI and an increased risk of academic racialization.
12	"Can I do this task?" The role of AI as a socializer of students' self-beliefs about their academic abilities (Jansen et al., 2024)	To develop a theoretical framework for understanding the role of AI as a socializer of students' self-beliefs about their academic abilities.	Conceptual framework development through an extension of Situated Expectancy-Value Theory (SEVT), integrating AI as an artificial social agent within learning environments.	AI was conceptualized as an "artificial socializer" that shapes students' self-beliefs. The extended SEVT framework provides a theoretical foundation for investigating students' self-perceptions in AI-based learning environments.
13	Who wrote this? Essay mills and assessment –	To explore the potential of innovative assessment design	Reflective analysis based on teaching experience in a UK	The study found that innovative assessment design and effective feedback can help

	Considerations regarding contract cheating and AI in higher education (Sweeney, 2023)	to reduce the prevalence of academic dishonesty associated with essay mills and AI.	business university, supported by a literature review and ethical analysis of AI use in higher education assessment.	reduce academic dishonesty. At the same time, AI tools such as ChatGPT intensify threats to academic integrity, highlighting the need for stronger university responsibility in the recruitment and support of international students.
14	Adoption of ChatGPT for students' learning effectiveness (Bhuiyan et al., 2025)	To examine the effectiveness of integrating ChatGPT as an educational resource in student learning.	Quantitative survey involving 505 university students in Malaysia, analyzed using PLS-SEM with SmartPLS 4.0.	The findings showed that technological competence had a positive effect on ChatGPT literacy and transparency, but no significant direct effect on adoption. Transparency mediated the relationship between technological competence and ChatGPT adoption, while user innovativeness moderated the relationships among the variables.
15	Do humans identify AI-generated text better than machines? Evidence based on excerpts from German theses (Fiedler & Döpke, 2025)	To investigate whether human experts can identify AI-generated academic texts more accurately than machine-based detectors.	Survey experiment involving 63 university lecturers in engineering, economics, and social sciences in Germany, who evaluated 200–300-word human- and AI-generated texts using regression analysis.	The findings showed that both human evaluators and AI detectors performed only slightly better than chance in identifying AI-generated texts (57% accuracy for AI texts and 64% for human texts). Professionally generated AI texts were the most difficult to identify, with fewer than 20% correctly detected, suggesting that traditional examination formats need to be reconsidered.
16	Acknowledging the new invisible colleague: Addressing the recognition of Open AI contributions in scientific publishing (Gorraiz, 2024)	To investigate the role of AI (ChatGPT) in academic research, particularly regarding the acknowledgment of AI contributions as author/co-author and the ways such contributions are recognized.	Bibliometric analysis using data from the Web of Science Core Collection and Scopus, focusing on citation patterns, co-authorship, and acknowledgment practices related to AI.	The findings showed that AI is increasingly cited as a source or mentioned in acknowledgment sections for transparency purposes. However, ethical guidelines such as those of COPE prohibit listing AI as an author because it cannot meet the intellectual requirements of authorship. The future role of AI in academic research will depend on how issues of access and equity are managed.
17	Creative partnerships with generative AI. Possibilities for education and beyond (Creely & Blannin, 2025)	To explore the possibility of creative partnerships between humans and generative AI, and their implications for education.	Collaborative autoethnography in which two authors developed creative outputs (poetry and multimodal narratives) using ChatGPT, which were analyzed through the concept of alterity relations from the philosopher of technology Don Ihde.	The findings showed that generative AI can serve as a creative partner, producing novel and unexpected outputs. Human–AI relations were found to be emergent and complex, with important implications for educators in rethinking creativity and creative production in the AI era.
18	Using early LLMs for corpus linguistics: Examining ChatGPT's potential and limitations (Uchida, 2024)	To evaluate the extent to which information can be obtained from an early LLM (ChatGPT 3.5) for corpus linguistics research.	Task-based experiment in which ChatGPT 3.5 was used to generate word frequency lists, collocations, grammatical patterns, and genre identification, with the results compared against the COCA corpus.	The findings showed good congruence for frequency lists (75%), collocations (42.8%), and grammatical patterns (53%). Although the LLM was not adequate for rigorous academic research, it proved useful for identifying general trends. Phrase-level search emerged as a particular strength of LLMs for corpus research.
19	Identifying ChatGPT-generated texts in EFL students' writing: Through comparative analysis of linguistic fingerprints (Mizumoto et al., 2024)	To investigate the ability to distinguish essays written by Japanese EFL students from essays generated by ChatGPT through linguistic analysis.	Partial replication of Herbold et al. (2023); 140 students wrote ChatGPT-generated essays, 123 additional essays, and a total of 263 essays were analyzed using NLP, automated linguistic	The findings revealed significant differences between human-written and ChatGPT-generated essays across all linguistic features, and ChatGPT texts were relatively easy to identify. The study highlights the need for clear ethical guidelines on AI use in

	analysis, and machine learning classification (random forest).	L2 writing and for shared understanding between teachers and learners.

Objectives, Methods, and Main Findings

A systematic review of the 19 articles presented in Table 2 shows that research on artificial intelligence (AI) in the modern academic sphere is broad and diverse, with objectives, methods, and findings varying widely. Most of the articles focus on evaluating the effectiveness and implications of AI use, particularly large language models (LLMs) such as ChatGPT, in automated writing assessment (Mizumoto et al., 2024; Mo & Crosthwaite, 2025; Uchida, 2024), scientific research productivity (Buscaldi et al., 2024; Gorraiz, 2024; Uchida, 2024), as well as teaching, information literacy, and institutional competence in academic libraries (Kautonen & Gasparini, 2024; Tomaszewski, 2024; Wu et al., 2024). In addition, several articles adopt conceptual and critical perspectives, proposing new theoretical frameworks, such as extending Situated Expectancy-Value Theory to the AI context (Jansen et al., 2024) and outlining a future research agenda for academic work (Renkema & Tursunbayeva, 2024). This diversity is also reflected in the methods employed, ranging from quantitative surveys using SEM (Bhuiyan et al., 2025; Bin-Nashwan et al., 2023b), controlled experiments (Netland et al., 2024; Fiedler & Döpke, 2025), corpus and NLP analyses (Mizumoto et al., 2024; Mo & Crosthwaite, 2025), case studies and qualitative interviews (Zheng, 2025), bibliometric analyses (Gorraiz, 2024; Tomaszewski, 2024), literature reviews and conceptual frameworks (Dwivedi et al., 2023; Jansen et al., 2024; Renkema & Tursunbayeva, 2024), to autoethnography (Creely & Blannin, 2024), collectively demonstrating the breadth and epistemological maturity of AI research in academic education.

Substantively, the 19 articles point to three major conclusions. First, AI has been shown to enhance efficiency and accuracy in various academic processes, as reflected in the CWLA assessment system, which achieved a correlation of 0.88 with human raters (Uchida & Negishi, 2025), transformer-based citation prediction performing at a level comparable to senior researchers (Buscaldi et al., 2024), and AI-generated instructional videos producing knowledge gains equivalent to those of human-made videos (Netland et al., 2024). Second, AI also poses serious challenges to academic integrity and authenticity, as AI-generated texts are becoming increasingly difficult to distinguish from human writing for both machine detectors and human experts (Fiedler & Döpke, 2025), ChatGPT produces texts with a distinctive "linguistic fingerprint" while increasingly approximating human writing (Mizumoto et al., 2024), and its adoption for academic purposes is shaped by complex social dynamics that may weaken integrity norms (Bin-Nashwan et al., 2023b; Sweeney, 2023). Third, the impact of AI is neither neutral nor universal, but instead mediated by existing social, cultural, and institutional contexts, as seen in the way ChatGPT use intensified linguistic anxiety among Chinese international students (Zheng, 2025), while library institutions that had not invested in AI literacy faced clear competency gaps (Kautonen & Gasparini, 2024; Wu et al., 2024). Taken together, these articles confirm that AI is not merely a technical tool, but a transformative force that requires systemic, ethical, and pedagogical responses across the academic ecosystem.

Table III. Synthesis of Findings Based on the Research Questions (RQ1 & RQ2)

No	Article Title	Author(s) & Journal	RQ 1	RQ 2
1	Assigning CEFR-J levels to English learners' writing: An approach using lexical metrics and generative AI	(Uchida & Negishi, 2025) Research Methods in Applied Linguistics	AI (ChatGPT/LLMs) was applied in automated academic writing assessment (Automatic Essay Scoring/AES) to determine CEFR-J proficiency levels. Context: English as a Foreign Language (EFL) education in Japan.	AI significantly improved the accuracy and efficiency of student writing assessment, showing a strong correlation (0.88) with human raters, reducing instructor workload, and providing meaningful feedback to students.
2	Use of ChatGPT in academia: Academic integrity hangs in the balance	(Bin-Nashwan et al., 2023a) Technology in Society 2023	AI (ChatGPT) was applied in general academic contexts, including idea generation, literature summarization, and essay writing by academics and researchers.	ChatGPT enhanced academic productivity through time-saving benefits, but also posed serious risks to academic integrity. This finding underscores the need for clear regulations and ethical guidelines from academic institutions and publishers.
3	The future of work of academics in the age of Artificial Intelligence	(Renkema & Tursunbayeva, 2024) Futures	AI was applied across multiple dimensions of academic work, including research (e.g., automated data analysis and literature review), teaching (e.g., personalization and automated feedback), and service (e.g., administration), within contemporary academic contexts.	AI has the potential to automate and augment academic work, thereby reshaping how knowledge is created, accessed, disseminated, and applied in higher education.

4	B-Wheel – Building AI competencies in academic libraries	(Kautonen & Gasparini, 2024) The Journal of Academic Librarianship	AI was applied in academic library contexts to enhance services, information literacy, and librarians' competencies in supporting academic research.	The implementation of AI in libraries has driven a transformation in librarians' roles and highlighted the need for new competency development. The B-Wheel model supports the holistic and sustainable development of AI capacity in academic environments.
5	A survey on the current status of AI literacy lectures in China's university libraries under the AIGC background	(Wu et al., 2024) The Journal of Academic Librarianship	AI (AIGC/GenAI) was applied in Chinese university library contexts as a tool to support research and academic communication, while simultaneously creating a growing need for AI literacy.	Academic libraries play a crucial role in AI literacy education. The limited systematicity and depth of AI literacy training hinder academic communities' readiness to engage effectively with the era of generative AI.
6	Mnemonic evaluative frameworks in scholarly publications: A cited reference analysis across disciplines and AI-mediated contexts	(Tomaszewski, 2024) The Journal of Academic Librarianship	AI was applied as a mediating context in academic information evaluation, where mnemonic evaluative frameworks were used in literature focusing on AI-mediated content (2022–present) across disciplines.	The emergence of generative AI has shifted the paradigm of academic information evaluation from static checklist models toward more adaptive, context-based approaches. A new framework, the CAT Test, is needed to assess AI-generated content.
7	Exploring the affordances of generative AI large language models for stance and engagement in academic writing	(Mo & Crosthwaite, 2025) Journal of English for Academic Purposes	Generative AI (ChatGPT, MetaAI, and ERNIEBot) was applied in cross-disciplinary academic writing contexts, particularly in generating academic texts that display stance and engagement features	LLMs produced academic texts with narrower and more repetitive stances and engagement patterns than human writers, affecting the quality of academic research output and carrying important implications for writing instruction and plagiarism detection.
8	Opinion Paper: "So what if ChatGPT wrote it?"	(Dwivedi et al., 2023) International Journal of Information Management	Generative AI (ChatGPT) was examined from multidisciplinary perspectives across research, practice, and policy contexts, including management, education, health, law, and other fields.	Generative AI has had a substantial influence on research processes, including writing, analysis, and literature review, as well as on academic outputs, while also creating ethical and policy challenges that require collaborative responses.
9	Citation prediction by leveraging transformers and natural language processing heuristics	(Buscaldi et al., 2024) Information Processing & Management	AI (transformer architecture and NLP) was applied in scientific writing contexts to automatically predict citation placement positions in academic papers.	AI was able to automate a technical aspect of scientific writing, namely citation prediction, with accuracy comparable to senior researchers, thereby demonstrating strong potential to improve both the productivity and quality of academic research output.
10	Comparing human-made and AI-generated teaching videos: An experimental study on learning effects	(Netland et al., 2024) Computers & Education	Generative AI (ChatGPT 3.5, Midjourney, DALL-E, and Movio/HeyGen) was applied in the Context of instructional content production, particularly for creating teaching videos in operational management within higher education.	AI-based instructional videos produced knowledge gains comparable to those of human-made videos, although the subjective learning experience was slightly lower. These findings suggest that AI has strong potential to revolutionize the efficient production of educational materials.
11	You don't need to prove yourself: A raciolinguistic perspective on Chinese international students' academic	(Zheng, 2025) Linguistics and Education	ChatGPT was applied as an academic language polishing tool by international EFL/ESL students in postgraduate programs in the United States.	The use of ChatGPT in academic writing intensified linguistic anxiety and language insecurity among international students, while also reinforcing racialized dynamics in academic surveillance, thereby negatively affecting their learning processes.

	language anxiety and ChatGPT use			
12	"Can (A)I do this task?" The role of AI as a socializer of students' self-beliefs of their abilities	(Jansen et al., 2024) Learning and Individual Differences	AI was examined as a social agent within AI-supported learning environments in formal education, influencing students' academic self-beliefs.	AI functions as an artificial socializer that shapes students' beliefs about their abilities, with effects that may either enhance or diminish learning motivation depending on how AI is integrated into educational settings.
13	Who wrote this? Essay mills and assessment – Considerations regarding contract cheating and AI in higher education	(Sweeney, 2023) International Journal of Management Education	AI (ChatGPT and similar chatbots) was examined in the Context of academic dishonesty in higher education, particularly in relation to essay mills and contract cheating.	AI intensifies threats to the integrity of educational assessment. Innovative assessment design is therefore required to preserve the quality of academic output and the integrity of learning processes.
14	Adoption of ChatGPT for students' learning effectiveness	(Bhuiyan et al., 2025) International Journal of Management Education	ChatGPT was applied as an educational resource in the Context of distance and informal learning at a university in Malaysia.	The adoption of ChatGPT was influenced by technological literacy and transparency. ChatGPT has the potential to enhance student learning when integrated into an appropriate instructional design.
15	Do humans identify AI-generated text better than machines? Evidence based on excerpts from German theses	(Fiedler & Döpke, 2025) International Review of Economics Education	AI (ChatGPT and AI text detectors) was examined in the Context of assessing academic written work (e.g., theses and dissertations) at German universities, involving the fields of engineering, economics, and social sciences.	Generative AI has made traditional written examination formats increasingly vulnerable to undetected misuse. Both human evaluators and machine detectors struggled to distinguish AI-generated texts, highlighting the need for reform in academic assessment.
16	Acknowledging the new invisible colleague: Addressing the recognition of OpenAI contributions in scientific publishing	(Gorraiz, 2024) Journal of Informetrics	AI (ChatGPT and Perplexity) was examined in the Context of academic scholarly publishing, particularly regarding the acknowledgment of AI contributions in authorship and citation practices across disciplines.	AI is reshaping scholarly publishing practices and disrupting traditional concepts of authorship and intellectual reciprocity. Clear ethical guidelines are therefore needed to ensure transparency in the recognition of AI contributions to research.
17	Creative partnerships with generative AI. Possibilities for education and beyond	(Creely & Blannin, 2025) Thinking Skills and Creativity	Generative AI (ChatGPT) was applied in the Context of creative production (poetry and multimodal narratives) by two teacher education academics and explored for its possible educational applications.	Generative AI has the potential to function as a creative partner in education and research; however, it requires a critical approach to avoid overdependence and to ensure the authentic development of human creativity.
18	Using early LLMs for corpus linguistics: Examining ChatGPT's potential and limitations	(Uchida, 2024) Research Methods in Applied Corpus	LLMs (ChatGPT 3.5) were applied in the Context of corpus linguistics research to generate linguistic data, including frequency lists, collocations, grammatical patterns, and genre identification.	LLMs have limited but useful potential as supportive tools in linguistic research. Their outputs are sufficiently informative for identifying general trends and supporting learning, although they do not yet meet the rigor required for strict academic research.
19	Identifying ChatGPT-generated texts in EFL students' writing: Through comparative analysis of linguistic fingerprints	(Mizumoto et al., 2024) Research Methods in Applied Corpus	ChatGPT was examined in the Context of Japanese students' L2 (EFL) writing, particularly in identifying AI misuse in academic assignments through NLP-based linguistic analysis.	AI (ChatGPT) significantly altered the linguistic characteristics of L2 academic texts. Clear ethical guidelines and shared awareness are therefore needed to prevent AI misuse that may undermine both academic integrity and the process of learning to write.

RQ1 (In what contexts was artificial intelligence applied in modern academic research during 2015–2025?)

The mapping of the 19 articles in Table III reveals that artificial intelligence was applied across a very broad and continuously expanding range of contexts throughout 2015–2025, with dramatic acceleration following the emergence of ChatGPT in late 2022. The most dominant Context of application is the assessment and evaluation of academic writing, where AI is used both as an automated scoring system that combines lexical metrics with AI-based scoring to assess CEFR-J levels (Uchida & Negishi, 2025), and as a linguistic analysis tool to compare stance and engagement features between LLMs and human writers (Mo & Crosthwaite, 2025), as well as an object of detection in the identification of academic misuse (Fiedler & Döpke, 2025; Mizumoto et al., 2024). Beyond assessment, AI has also been actively applied to scientific research productivity, including the prediction of citation placement in academic papers (Buscaldi et al., 2024), the extraction of linguistic corpus data (Uchida, 2024), and the analysis of patterns of AI acknowledgment in international scholarly publishing (Gorraiz, 2024). In addition, AI has been used to produce learning content through AI-generated instructional videos (Netland et al., 2024) and in human–AI creative partnerships for teacher education(Creely & Blannin, 2025). Another equally important context is academic integrity, where ChatGPT has been examined both as a threat to originality in academic work (Bin-Nashwan et al., 2023b; Sweeney, 2023) and as a tool used by students to "standardize" their academic writing (Bhuiyan et al., 2025; Zheng, 2025).

At the institutional level, AI has been applied in the development of competencies and literacy in academic libraries, including through the design of holistic strategic models such as the B-Wheel (Kautonen & Gasparini, 2024), surveys on the status of AI literacy training in leading Chinese universities (Wu et al., 2024), and analyses of the evolution of information evaluation frameworks in response to AI-mediated content (Tomaszewski, 2024). At the conceptual and theoretical level, AI has been contextualized as a force reshaping the future of academic work comprehensively, encompassing dimensions of space, time, and task (Renkema & Tursunbayeva, 2024), as well as an artificial socialization agent that shapes students' academic self-beliefs (Dwivedi et al., 2023; Jansen et al., 2024) provide the broadest Context by examining the multidisciplinary implications of generative AI, involving more than 80 scholars across management, education, health, and law. Overall, the identified pattern shows that the Context of AI applications in modern academic research has evolved from initially technical and limited uses, such as rule-based systems for standardized assessment, toward increasingly generative, personalized, and cross-disciplinary applications, with ChatGPT and similar LLMs serving as the primary catalysts of this expansion from 2022 to 2023 through 2025.

RQ2 (How has artificial intelligence influenced the process and output of research in education over the past decade?)

Based on the mapping of the 19 articles in Table III, the role of artificial intelligence in shaping the process and output of educational research is multidimensional, simultaneous, and not uniformly positive. At the process level, AI has clearly accelerated and improved the precision of several stages of academic work. Writing assessment has become more consistent and standardized through AI-based automated essay scoring systems (Uchida & Negishi, 2025), the production of learning materials has become substantially more efficient through LLM-generated instructional videos with output quality comparable to manually produced materials (Netland et al., 2024), and scientific writing has been supported through automatic citation prediction whose accuracy does not significantly differ from that of senior researchers (Buscaldi et al., 2024). However, this acceleration has also introduced new tensions that threaten the foundations of academic processes themselves. Assessment integrity is weakened because AI-generated texts are increasingly difficult to detect, both for human evaluators and machine detectors (Fiedler & Döpke, 2025. Student writing processes are distorted by reliance on ChatGPT, which, in some cases, intensifies linguistic anxiety rather than alleviating it (Zheng, 2025). Authorship norms in scholarly publishing are being challenged by questions about how AI contributions should be ethically acknowledged (Gorraiz, 2024). More broadly, AI is also transforming academic socialization processes, functioning as an artificial socialization agent that shapes students' beliefs about their own academic ability, with effects that may either strengthen or weaken learning motivation depending on how it is integrated (Jansen et al., 2024).

At the output level, AI's influence on educational and research outcomes shows a similarly deep ambivalence. On the one hand, AI has contributed to increasingly measurable and high-quality academic outputs. AI-based scoring systems produce results that are highly correlated with expert human judgments (Uchida & Negishi, 2025), AI-generated instructional videos yield knowledge gains equivalent to those produced by human-made videos, even though the subjective learning experience remains slightly lower (Netland et al., 2024). Llms are capable of generating linguistic data adequate for identifying broad research trends (Uchida, 2024). On the other hand, academic output in the form of students' and researchers' original work is increasingly threatened by the proliferation of AI-generated texts that are becoming harder to distinguish, thereby creating an urgent need to reform assessment design Fiedler & Döpke, 2025; Sweeney, 2023). At the institutional level, AI has also stimulated new policy and model outputs: academic libraries are developing holistic AI competency models (Kautonen & Gasparini, 2024), information evaluation frameworks are evolving to

accommodate AI-mediated content (Tomaszewski, 2024), and research roadmaps on the future of academic work are beginning to take shape (Creely & Blannin, 2025; Dwivedi et al., 2023; Renkema & Tursunbayeva, 2024) further show that AI is generating new conceptual outputs in the form of multidisciplinary perspectives on creativity, ethics, and AI governance, thereby enriching global academic discourse. Overall, the findings from these 19 articles confirm that AI has had both an accelerating and a disruptive influence on educational research over the past decade: it has improved the speed and quality of many academic processes, while simultaneously demanding a fundamental restructuring of the values, norms, and infrastructures that sustain research integrity and quality.

Discussion

AI as an Accelerator of Academic Productivity

The findings of this systematic review consistently support the proposition that AI has become a significant accelerator of productivity in modern academic research. This result aligns with (Hajkowicz et al., 2023), who documented a dramatic increase in AI integration across disciplines since 2014, and is further reinforced by (Fayda-Kinik, 2025), who reported AI involvement in more than 98% of academic fields by 2021. In this review, the accelerating effect is most evident in three domains: automated assessment, citation prediction, and instructional content production.

The CWLA system developed by Uchida & Negishi (2025) achieved a correlation of 0.88 with human ratings, exceeding conventional inter-rater reliability thresholds in applied linguistics. This finding parallels the results of Buscaldi et al. (024), who showed that a transformer-based citation prediction model produced citation placements that did not differ significantly from those generated by three senior researchers. Taken together, these findings confirm AI's capacity to automate technical aspects of the research process that have traditionally required substantial expertise and time. This is consistent with Renkema & Tursunbayeva's (2024) argument that AI has the potential to augment and automate academic work across a broad range, from data analysis to literature review.

In the domain of learning content production, Netland et al. (2024) found that AI-generated instructional videos produced knowledge gains equivalent to those of human-made videos, although the subjective learning experience was slightly lower. This finding extends the discussion advanced by Villegas-Ch et al. (2025) on the role of AI in adaptive intelligent tutoring systems and provides empirical evidence that AI can serve as an efficient content-production partner without substantially compromising cognitive learning quality.

Challenges to Academic Integrity and Authenticity

At the same time, this review reveals that integrating AI into academic practice raises serious, multidimensional challenges to the integrity and authenticity of research. (Fiedler & Döpke, 2025) showed that both human evaluators and machine detectors were only slightly more accurate than chance in identifying AI-generated texts, while professionally produced AI texts were correctly identified in fewer than 20% of cases. This finding has major policy implications and reinforces the concerns raised by Daoudi (2025) and Llerena-Izquierdo & Ayala-Carabajo (025) regarding the growing threat of AI to academic integrity, particularly as conventional detection mechanisms become increasingly ineffective.

(Bin-Nashwan et al., 2023b), A survey of 702 academics found that academic integrity had a negative direct effect on ChatGPT use; however, when academic integrity acted as a moderator, it strengthened the influence of several other factors on ChatGPT adoption. This paradoxical pattern suggests that academic integrity norms do not operate linearly in the Context of AI adoption, and that policy interventions relying solely on reinforcing integrity values, without appropriate institutional design, may prove insufficient. This is consistent with Sweeney's (2023) argument that innovative assessment design, rather than prohibition alone, represents a more productive response to the threat AI poses to academic integrity.

The linguistic dimension of this challenge is further highlighted by Mizumoto et al. (2024), who found that although ChatGPT-generated texts differed significantly from human texts in linguistic features, they were increasingly approaching the characteristics of human writing. Similarly, Mo & Crosthwaite (025) showed that LLM-generated texts exhibited narrower and more repetitive stance and engagement features than those written by humans, with important implications for the teaching of academic writing in the AI era. Collectively, these findings indicate that AI is creating a new assessment landscape that requires comprehensive reform, as also emphasized by Dwivedi et al (2023) in their large-scale, multidisciplinary discussion involving more than 80 scholars.

Contextual, Social, and Institutional Inequalities

Perhaps the most critical finding of this review is the empirical confirmation that AI's effects are neither neutral nor universal, but are strongly mediated by social, cultural, and institutional contexts. (Zheng, 2025), Through qualitative research with 18 Chinese international students, it was demonstrated that the use of ChatGPT for academic writing intensified linguistic anxiety and reinforced racialized dynamics of academic surveillance. This finding directly challenges the assumption that AI inherently functions as an equalizer in education and provides empirical support for the concerns raised by Anuyah et al. (2023) and Borines et al. (2024) regarding the cultural misalignment of AI systems for students from the Global South.

Kautonen & Gasparin (2024) identified four interrelated systemic problems in Chinese university libraries at the institutional level: low librarian participation in AI literacy

programs, imbalanced training content, the absence of an AI ethics dimension, and a lack of systematic curriculum design in AI literacy education. These findings also align with their development of the B-Wheel model, which was proposed to address the inadequacy of ad hoc AI training approaches in Scandinavian academic libraries. Taken together, these findings suggest that institutional readiness for the AI era remains insufficient, even in countries with relatively advanced digital infrastructures.

The conceptual framework developed by Jansen et al. (2024) through the extension of Situated Expectancy-Value Theory (SEVT) provides an important theoretical basis for understanding the mechanisms by which AI, as an "artificial socialization agent," shapes students' academic self-beliefs. This framework addresses a major theoretical gap in the literature by explaining how students' interactions with AI systems may gradually reshape their perceptions of competence and academic identity. This perspective complements the concerns raised by Mohammadkarimi & Omar (2025) and Yavich (2025) regarding risks to critical thinking, while grounding those concerns in a more detailed, empirically informed psychological mechanism.

Implications for Policy and Practice

The synthesis of the 19 reviewed articles suggests several urgent practical implications. First, academic assessment design requires substantial reform and cannot rely solely on traditional written examination formats, given the documented inability to reliably detect AI-generated texts (Fiedler & Döpke, 2025; Mizumoto et al., 2024). Such reform should include the development of more holistic, process-oriented assessment rubrics rather than approaches focused exclusively on final products, as Sweeney (2023) suggests.

Second, higher education institutions need to develop systematic and integrated AI literacy frameworks within the curriculum rather than relying on incidental workshops. The findings of Kautonen & Gasparini (2024) and Wu et al. (024) indicate that holistic, learning-by-doing approaches are more effective in building sustainable AI competence than conventional declarative training. This aligns with the recommendations of Loucif et al. (2025) and Tabacu (2025) on the need for binding, comprehensive institutional policies governing AI use in academic settings.

Third, Gorrai's (2024) discussion of acknowledging AI contributions in scholarly publishing, together with COPE guidance prohibiting AI as an author, underscores the urgency of developing globally consistent ethical standards. The regulatory fragmentation identified by Loucif et al. (025) constitutes a systemic risk that may erode public trust in the integrity of scientific knowledge. In this Context, the multidisciplinary perspective offered by Dwivedi et al. (2023), along with the Human-AI Symbiotic Theory (HAIST) developed by Kumar et al. (2023) and Morello & Chick (2025), provides a promising conceptual foundation for building a responsible, fair, and sustainable research ecosystem in the AI era.

CONCLUSION

This systematic review of 19 articles published between 2015 and 2025 confirms that artificial intelligence (AI) has become a transformative force that simultaneously accelerates and disrupts the modern academic research ecosystem, particularly in education. In response to RQ1, AI has been applied across a broad and expanding range of contexts, including automated writing assessment, citation prediction, LLM-based instructional content production, the development of AI literacy in academic libraries, and studies on academic integrity and the socialization of students' learning identities, with ChatGPT and similar large language models serving as the principal catalysts since 2022. In response to RQ2, the influence of AI on the processes and outputs of educational research is dual and uneven: on the one hand, AI has significantly improved efficiency, consistency, and academic productivity; on the other hand, it has introduced serious threats to assessment integrity, the authenticity of academic writing, and equality of access for academic communities situated in different social and cultural contexts.

These findings indicate that responses to AI cannot remain merely technical or regulatory, but must involve a broader systemic transformation encompassing the reform of academic assessment design, the development of integrated AI literacy curricula, and the establishment of consistent global ethical frameworks for governing AI use in academic environments. However, this review is limited by its reliance on a single database and the still-limited representation of Global South perspectives in the selected literature. Future research is recommended to expand database coverage and the representation of Global South contexts, as well as to develop longitudinal studies capable of capturing the evolving impact of AI on research quality and the sustained development of academic competence.

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