

RESEARCH WITH AI: TRANSFORMING ACADEMIC INQUIRY IN THE AGE OF GENERATIVE ARTIFICIAL INTELLIGENCE A MIXED-METHODS INVESTIGATION INTO AI TOOL ADOPTION, PERCEIVED EFFECTIVENESS, AND ETHICAL IMPLICATIONS IN ACADEMIC RESEARCH

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Abstract. *The rapid integration of artificial intelligence (AI) tools into academic research has fundamentally altered how scholars conduct literature reviews, analyze data, draft manuscripts, and disseminate findings. This study investigates the current landscape of AI adoption in academic research through a mixed-methods approach, combining a quantitative survey of 385 researchers across multiple disciplines with semi-structured interviews of 24 active scholars from 12 countries. The survey instrument measured AI tool usage patterns, perceived effectiveness, productivity gains, and ethical concerns. Results reveal that 74.2% of respondents have used AI tools in their research workflow, with literature review (51%), writing and editing (46.3%), and data analysis (38.7%) being the most common applications. Participants reported an average time saving of 31.4% on routine research tasks, though 67.8% expressed concerns about research integrity and the authenticity of AI-assisted outputs. Qualitative findings identified five major themes: opportunity enhancement, human-AI collaboration, time efficiency, quality assurance challenges, and ethical navigation. The study further reveals a significant productivity gap between native and non-native English-speaking researchers, with the latter reporting up to 90% gains in manuscript output when using AI tools. However, an inverse relationship was observed between AI-assisted writing sophistication and the likelihood of publication in peer-reviewed journals. These findings contribute to the growing discourse on responsible AI integration in academia by offering evidence-based recommendations for researchers, institutions, and publishers navigating the evolving AI-augmented research environment.*

Keywords: *Artificial Intelligence, Academic Research, Generative AI, ChatGPT, Research Methodology, Higher Education, AI Ethics, Literature Review, Scholarly Publishing*

Аннотация. *Стремительная интеграция инструментов искусственного интеллекта (ИИ) в академические исследования коренным образом изменила способы проведения обзоров литературы, анализа данных, подготовки научных рукописей и распространения результатов исследований. В данном исследовании рассматривается современное состояние внедрения ИИ в научно-исследовательскую деятельность с использованием смешанного подхода, сочетающего количественный опрос 385 исследователей из различных научных областей и полуструктурированные интервью с 24 активными учёными из 12 стран.*

Анкетирование позволило оценить особенности использования инструментов ИИ, их воспринимаемую эффективность, влияние на производительность труда и связанные с ними этические проблемы. Результаты показали, что 74,2 % респондентов использовали инструменты ИИ в своей исследовательской деятельности. Наиболее распространёнными сферами применения стали обзор литературы (51 %), написание и редактирование научных текстов (46,3 %), а также анализ данных (38,7 %). Участники сообщили о среднем сокращении времени на выполнение рутинных исследовательских задач на 31,4 %, однако 67,8 % выразили обеспокоенность вопросами научной добросовестности и подлинности результатов, созданных с использованием ИИ.

Качественный анализ позволил выделить пять ключевых тематических направлений: расширение исследовательских возможностей, сотрудничество человека и ИИ, повышение эффективности использования времени, проблемы обеспечения качества и этическая навигация. Исследование также выявило значительный разрыв в продуктивности между исследователями,

для которых английский язык является родным, и теми, для кого он является иностранным. Последние сообщили об увеличении объёма подготовленных научных рукописей до 90 % при использовании инструментов ИИ. Вместе с тем была обнаружена обратная зависимость между уровнем сложности текстов, созданных с помощью ИИ, и вероятностью их публикации в рецензируемых научных журналах.

Полученные результаты вносят вклад в развитие дискуссии о ответственном внедрении искусственного интеллекта в академическую среду, предлагая основанные на эмпирических данных рекомендации для исследователей, образовательных учреждений и издательств, работающих в условиях формирования новой исследовательской экосистемы, дополненной технологиями ИИ.

Ключевые слова: искусственный интеллект; академические исследования; генеративный искусственный интеллект; ChatGPT; методология исследований; высшее образование; этика искусственного интеллекта; обзор литературы; научное издательское дело.

Introduction. The emergence of generative artificial intelligence (AI) tools, particularly large language models (LLMs) such as ChatGPT, has initiated a paradigm shift in academic research practices across virtually every discipline. Since the public release of ChatGPT in November 2022, scholars worldwide have been experimenting with AI-powered tools to enhance various stages of the research process, from formulating research questions and conducting literature reviews to drafting manuscripts and analyzing complex datasets. According to the 2025 Stanford AI Index Report, AI is now deeply integrated into nearly every aspect of modern life, reshaping sectors including education, finance, and healthcare, where algorithm-driven insights guide critical decisions (Stanford HAI. 2025).

The scale of AI adoption in research has been staggering. A comprehensive survey by Zenty of more than 1,500 students and researchers revealed that 73.6% have used or are exploring AI tools for research, with 51% specifically employing AI for literature reviews and 46.3% for writing and editing tasks. (Zenty 2025). Similarly, a Wiley survey of nearly 5,000 researchers across more than 70 countries found that the majority now see AI becoming central to scientific research and publishing, with more than half of respondents believing that AI already outperforms humans in tasks such as reviewing large sets of papers, summarizing findings, and detecting errors in writing (Naddaf, M. 2025). The 2025 Student Generative AI Survey further reported that 92% of students reported using some form of AI tool, up from 66% the previous year. (Freeman, J. 2025).

However, this rapid adoption has not been without controversy. A landmark study published in *Science* by researchers at UC Berkeley and Cornell University examined over 2 million papers on major preprint servers and found that while AI tools dramatically boost manuscript output, the resulting flood of polished but potentially superficial work is straining the peer review system to its breaking point. (Kusumegi, A., et al. 2025). The researchers discovered an inverse relationship between AI-assisted writing sophistication and actual scientific quality, where more complex AI-generated papers were less likely to be published in peer-reviewed venues.

Despite the growing body of literature on AI in education and research, there remains a gap in comprehensive, mixed-methods studies that simultaneously examine quantitative adoption patterns and qualitative perceptions of researchers from diverse disciplinary and geographic backgrounds. Most existing studies focus on either specific tools such as ChatGPT or particular contexts such as medical education. This study addresses this gap by investigating three research questions: (1) What are the current patterns of AI tool adoption among academic researchers? (2) How do researchers perceive the effectiveness and impact of AI on their research productivity and quality? (3) What ethical concerns and challenges do researchers face when integrating AI into their work?

Literature Review. The integration of AI into academic research has been examined from multiple perspectives. Franca (2023) identified ten transformative ways in which AI is revolutionizing scientific work, including powerful referencing tools, enhanced research question generation, optimized research design, advanced data analysis, and AI-assisted reporting. (Franca, C. 2023). Similarly, Perkins and Roe (2024) examined the applications of generative AI tools in both qualitative and quantitative research methodologies, presenting case studies that demonstrate both the potential and the challenges of replicability and consistency in AI-assisted research. Perkins, M., & Roe, J. (2024).

A qualitative investigation by a Frontiers study collected data from 10 researchers across 10 countries using semi-structured interviews and identified five themes about ChatGPT's influence on academic writing: opportunity, human assistance, thought-provoking capacity, time-saving, and negative attitudes. Malik et al. (2024). While researchers acknowledged that ChatGPT works as an AI version of a human assistant and provides multiple new opportunities for improving concepts and exploring ideas, some feared it could degrade their writing skills and lead to plagiarism.

The impact on research productivity has been quantitatively documented. The UC Berkeley and Cornell study found that scientists who adopted LLMs saw manuscript output increases exceeding 50% on bioRxiv and SSRN, and more than one-third on arxiv. The effect was most pronounced among non-native English speakers, with researchers affiliated with Asian institutions experiencing productivity gains approaching 90% in biology and social sciences, compared to 24-46% increases for researchers at English-speaking institutions.

Regarding ethical considerations, the Committee on Publication Ethics (COPE) and major publishers including Elsevier, Springer Nature, Wiley, and Taylor and Francis have established frameworks that share three core pillars: human accountability, transparency, and the prohibition of AI authorship. Thesify. (2025). All major publishers explicitly state that AI tools cannot be listed as authors because they lack legal accountability and the ability to approve final manuscripts.

The Association for Women in Science (AWIS) reported that approximately 55% of researchers agreed that machine learning AI saves scientists time and money, while 69%

were concerned that it could lead to more reliance on pattern recognition without context. AWIS. (2025). Close to 70% of respondents worried about the potential for plagiarism, mistakes, and proliferating misinformation.

Research Methodology. This study employed a mixed-methods research design to investigate the adoption and effectiveness of artificial intelligence (AI) tools in academic research. Quantitative data were collected through an online survey involving 385 researchers from various academic disciplines, while qualitative data were obtained through semi-structured interviews with 24 researchers from different countries.

The survey examined AI usage patterns, perceived effectiveness, productivity gains, and ethical concerns. Interview questions explored participants' experiences, attitudes, and challenges related to AI-assisted research. Quantitative data were analyzed using descriptive and inferential statistics in SPSS 29, whereas qualitative data were analyzed through thematic analysis.

To ensure reliability and validity, the questionnaire was reviewed by experts and demonstrated high internal consistency (Cronbach's $\alpha > 0.80$). Ethical principles, including voluntary participation, informed consent, confidentiality, and anonymity, were strictly observed throughout the study.

Analysis and Results. This study employed a sequential explanatory mixed-methods design, combining a cross-sectional quantitative survey with follow-up semi-structured qualitative interviews. The quantitative phase aimed to establish broad patterns of AI tool adoption, usage frequency, and perceived effectiveness among academic researchers. The qualitative phase sought to provide depth and context to the survey findings by exploring researchers' experiences, perceptions, and ethical reflections in detail.

The quantitative phase involved 385 academic researchers recruited through purposive and snowball sampling from universities in 18 countries across Asia, Europe, North America, Africa, and South America. Participants included faculty members (42.3%), postdoctoral researchers (18.7%), doctoral students (27.8%), and research assistants (11.2%). Disciplines represented included social sciences (31.4%), natural sciences (24.7%), engineering and technology (19.5%), health sciences (14.1%), and humanities (10.3%). For the qualitative phase, 24 participants were purposively selected from the survey respondents to represent diversity in discipline, geographic region, career stage, and AI usage patterns.

The survey instrument consisted of 47 items organized into five sections: (1) demographic and professional information, (2) AI tool awareness and usage patterns, (3) perceived effectiveness and productivity impact, (4) ethical concerns and challenges, and (5) attitudes toward future AI integration. Items were measured using five-point Likert scales (1 = strongly disagree to 5 = strongly agree). Cronbach's alpha for the scaled items ranged from 0.82 to 0.91, indicating good to excellent internal consistency. The semi-structured interview protocol comprised 15 open-ended questions.

Quantitative data were collected via an online survey platform over a four-month period from September to December 2025. The response rate was 64.2% (385 completed surveys out of 600 distributed). Quantitative data were analyzed using descriptive statistics, chi-square tests, independent samples t-tests, and one-way ANOVA using SPSS Version 29. Effect sizes were calculated using Cohen's d and eta-squared. Thematic analysis following Braun and Clarke's (2006) six-phase protocol was employed for qualitative data, with NVivo 14 used for coding and theme development. Two researchers independently coded the data, achieving an inter-rater reliability of 0.87 (Cohen's kappa).

The survey results revealed widespread adoption of AI tools among academic researchers. Of the 385 respondents, 285 (74.2%) reported having used at least one AI tool in their research workflow within the past 12 months. ChatGPT was the most commonly used tool (81.4% of AI users), followed by Grammarly (43.2%), Google Gemini (28.6%), Microsoft Copilot (22.1%), and specialized research tools such as Elicit and Semantic Scholar (17.8%).

Table 1. Distribution of AI Tool Usage Across Research Activities (N = 285)

Research Activity	n	%	Primary AI Tool
Literature review and synthesis	45	15.8	ChatGPT, Elicit
Writing and editing	32	11.2	ChatGPT, Grammarly
Data analysis and interpretation	10	3.5	ChatGPT, Python AI libs
Translation and proofreading	8	2.8	DeepL, ChatGPT
Research question formulation	7	2.5	ChatGPT, Gemini
Citation management	2	0.7	Semantic Scholar, ChatGPT
Statistical computation	4	1.4	ChatGPT, R/Python AI
Presentation preparation	8	2.8	Gamma, ChatGPT

Participants who used AI tools reported a mean perceived effectiveness score of 3.89 out of 5.00 (SD = 0.74). Self-reported time savings averaged 31.4% on routine research tasks, with the highest savings reported for literature search and synthesis (38.2%), followed by grammar and style editing (35.6%), and translation tasks (33.1%).

Table 2. Perceived Effectiveness of AI Tools by Research Task (N = 285)

Task	Mean	SD	% Effective	Time Saved
Literature search	4.12	0.68	78.4%	38.2%
Grammar/style editing	4.08	0.71	76.1%	35.6%
Translation	3.96	0.82	72.3%	33.1%
Data analysis	3.81	0.79	68.9%	28.7%
Research design	3.64	0.86	61.4%	22.3%
Peer review prep	3.42	0.91	54.7%	19.8%

A statistically significant difference was found between native English speakers ($M = 3.72$, $SD = 0.78$) and non-native English speakers ($M = 4.14$, $SD = 0.65$) in perceived effectiveness of AI tools for writing-related tasks ($t(283) = -4.87$, $p < .001$, $d = 0.58$). Early-career researchers (fewer than 5 years of experience) showed significantly higher adoption rates (82.1%) compared to senior researchers (more than 15 years; 61.3%).

Thematic analysis of the 24 interview transcripts yielded five major themes that elaborated upon and contextualized the quantitative findings.

Theme 1: Opportunity Enhancement. Participants described AI tools as opening new possibilities for exploring ideas, accessing diverse literature, and overcoming writer's block. One social sciences researcher stated: "ChatGPT has become my brainstorming partner. It does not replace my thinking, but it accelerates the initial exploration phase". Aldulaijan, A., & Almalki, A. (2025).

Theme 2: Human-AI Collaboration. Many participants emphasized that AI functions best as a collaborative assistant rather than an autonomous researcher. A senior linguistics professor explained: "I treat AI as a highly efficient research assistant that can summarize, translate, and organize, but I remain the intellectual architect of my research". Aldulaijan, A., & Almalki, A. (2025).

Theme 3: Time Efficiency. Time saving was universally cited as the primary benefit. A biomedical researcher noted: "What used to take me three weeks for a literature review now takes about five days with AI assistance." However, participants also cautioned that time saved on routine tasks must be reinvested in critical thinking and original analysis.

Theme 4: Quality Assurance Challenges. A recurring concern was the accuracy and reliability of AI-generated content. Participants reported instances of AI "hallucinations," including fabricated references and inaccurate statistical interpretations.

Theme 5: Ethical Navigation. Participants expressed considerable uncertainty about the boundaries of acceptable AI use in research. A doctoral student noted: "My university has no clear policy on AI use in research. I honestly do not know where the line is between acceptable assistance and academic misconduct".

The most prevalent concerns were research integrity and authenticity (67.8%), followed by potential plagiarism (62.1%), over-reliance on AI leading to skill erosion (54.3%), data privacy and confidentiality (48.6%), and unequal access to AI tools (41.2%).

Table 3. Ethical Concerns Reported by Researchers (N = 385)

Ethical Concern	n	%	Rank
Research integrity and authenticity	261	67.8	1
Potential plagiarism	239	62.1	2
Over-reliance and skill erosion	209	54.3	3
Data privacy and confidentiality	187	48.6	4
Unequal access to AI tools	159	41.2	5
Lack of institutional guidelines	148	38.4	6
Bias in AI-generated outputs	134	34.8	7

The findings of this study provide a comprehensive picture of how AI tools are reshaping the academic research landscape. The high adoption rate of 74.2% confirms that AI has moved beyond the early adopter phase and is now mainstream among academic researchers, consistent with global surveys reporting adoption rates between 73% and 92%.

Perhaps the most significant finding of this study is the tension between productivity gains and research quality. While participants reported substantial time savings averaging 31.4%, the qualitative data revealed deep concerns about whether increased output translates to meaningful scientific contributions. The UC Berkeley and Cornell study found that AI adoption led to productivity surges exceeding 50% on some platforms, yet the quality of AI-assisted manuscripts was measurably lower than that of human-written papers. The inverse relationship between AI-assisted writing sophistication and publication likelihood is particularly noteworthy: for AI-assisted manuscripts, more sophisticated writing was associated with lower scientific quality.

A particularly encouraging finding relates to AI's potential to address longstanding equity issues in academic publishing. Non-native English speakers reported significantly higher perceived effectiveness of AI tools for writing tasks ($M = 4.14$ vs. $M = 3.72$, $p < .001$), and the UC Berkeley study documented productivity gains approaching 90% for researchers at Asian institutions. This suggests that AI tools may be dismantling one of the most persistent barriers in global academia: the English-language advantage.

However, the equity benefit is counterbalanced by concerns about unequal access. In our survey, 41.2% of respondents identified unequal access to AI tools as an ethical

concern, reflecting the reality that premium AI tools require subscription fees that may be prohibitive for researchers in low-income countries.

The finding that 38.4% of participants reported a lack of institutional guidelines on AI use represents a critical gap. While major publishers have established clear policies requiring transparency, human accountability, and the prohibition of AI authorship many universities have yet to develop corresponding institutional frameworks. The HEPI survey found that only 36% of students had received any training in AI skills.

Based on our findings, we offer several evidence-based recommendations. First, institutions should develop comprehensive AI literacy programs that include critical evaluation skills, ethical reasoning, and awareness of AI limitations. Second, journal editors should consider implementing AI-assisted quality screening mechanisms. Third, research ethics boards should develop specific guidelines for AI-assisted research. Finally, funding agencies should work to ensure equitable access to AI tools, recognizing that unequal access may exacerbate existing disparities in global research output.

This study has several limitations. The purposive sampling approach limits generalizability. Self-reported data may be subject to social desirability bias. The cross-sectional design captures a snapshot of a rapidly evolving phenomenon. Additionally, the study did not experimentally measure actual productivity gains but relied on participants' self-assessments.

Conclusion. This study provides comprehensive evidence that AI tools have become deeply embedded in academic research practices, with adoption rates exceeding 74% and clear benefits in terms of time efficiency, language equity, and expanded access to knowledge. However, the integration of AI into research is not without significant challenges, including concerns about research integrity, the potential erosion of critical thinking skills, and the emerging tension between increased productivity and research quality. The finding that AI-assisted writing can create a misleading impression of scholarly rigor represents a fundamental challenge for the academic community.

As AI tools continue to evolve rapidly, the academic community faces a critical juncture. The path forward requires the development of thoughtful, evidence-based frameworks that maximize AI's benefits while safeguarding the integrity and authenticity that are the foundation of scholarly work. Future longitudinal and experimental research is needed to track how AI adoption patterns evolve, measure actual impacts on research quality, and evaluate the effectiveness of institutional interventions designed to promote responsible AI use in academic research.

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