

Supporting Information for Academic Journals' AI Policies Fail to Curb the Surge in AI-assisted Academic Writing.

Yongyuan He and Yi Bu

Corresponding author: Yi Bu
Email: buyi@pku.edu.cn

This PDF file includes:

Figures S1 to S6
Tables S1 to S9
SI References

Supporting Information Text

AI policy collection

Policy data were collected at two distinct time points. The first phase of data collection was conducted in January 2025 through a three-step manual approach:

Step 1: We manually searched for journal names and reviewed specific pages, including submission guidelines, author information, and journal policies, to identify texts related to policies governing authors' use of AI.

Step 2: We strictly excluded content concerning reviewers' use of AI or AI applications in images and focused solely on policies regarding authors' use of AI in writing.

Step 3: We adopted LLMs (GPT-4o-mini and Gemini 2.5 Flash) to examine and categorize the results.

The second phase took place in October 2025, employing an automated five-step crawling pipeline.

Step 1: We utilized the Serper API (1) to retrieve journal homepage URLs by searching for journal names combined with their ISSNs and publishers.

Step 2: To improve the accuracy of retrieval, we prioritized domains of well-known publishers (e.g., nature.com, sciencedirect.com, wiley.com, ieee.org, springer.com) and excluded non-journal webpages or third-party aggregators based on domain names (e.g., researchgate.net, semanticscholar.org, wikipedia.org, and repositories like sci-hub). A complete list of domain names is shown in [Table S9](#).

Step 3: We employed the open-source tool Crawl4AI (2) to identify specific policy URLs, adjusting the method to task the model solely with returning target locations to mitigate token limitations and hallucinations. The identified pages were parsed, and paragraphs containing the following specific keywords as candidate AI policy content: "ai," "artificial intelligence," "llm," "generative ai," "language model," and "ChatGPT."

Step 4: GPT-4o-mini and Gemini 2.5 Flash were then used to identify and filter out data that did not align with our predefined policy scope. We exclusively retained texts specifying the guidelines for authors' use of AI tools during the academic writing process; policies about peer reviewers or editors, as well as those concerning AI-generated images or charts, were systematically excluded. Detailed criteria are provided in the "**Policy classification prompt**" section.

Step 5: For cases where websites refused automated access or were judged not to be journal webpages, we manually checked and supplemented the data.

Publication data collection

Our publication data were primarily sourced from OpenAlex (3), a large-scale bibliographic database that covers multiple disciplines in natural sciences and engineering, life sciences, social sciences, and arts and humanities. We extracted data from the May 30, 2025 snapshot by linking JCR journals with OpenAlex journals via ISSN or journal names. We only retained English-language publication records from January 2021 to May 2025, including metadata such as DOI, title, abstract, institutional countries of all authors ([Materials and Methods](#)), and paper domains/fields. For June 2025 metadata missing from the aforementioned snapshot, we supplemented through OpenAlex's API (3), resulting in a total of 6,704,911 papers. However, we noticed that 2,768,778 records (41.29%) lacked abstracts.

To supplement missing abstracts, we retrieved corresponding records from the Web of Science database

and merged them with OpenAlex records via DOI matching, using title matching (standardized to lowercase with special characters removed) as fallback. After merging and removing records with missing information, the final dataset contained 5,235,012 publications for further analyses.

Policy classification prompt

You are an expert in academic journal policy analysis. Given a policy text about AUTHORS' use of AI in academic writing, output a structured judgment.

Rules:

- Category (choose EXACTLY ONE of the following labels):

1) Strict Prohibition: clearly prohibits authors from using AI for academic writing, including editing, translation, or content generation.

2) Open: allows authors to use AI AND explicitly does NOT require disclosure.

3) Disclosure Required: allows authors to use AI BUT requires disclosure in the manuscript (extract disclosure location).

4) Not Mentioned: the text is not about AUTHORS' use of AI (e.g., only about peer review or editors), or insufficient to determine.

- Disclosure location: ONLY when category is "Disclosure Required," summarize a free-text location from the policy (do NOT choose from fixed options). Examples include but are not limited to: Methods section, Acknowledgements, Cover letter, Title page, End-of-manuscript statement, Submission system, etc. If multiple locations are acceptable, summarize briefly; if not specified, return an empty string.

- Reason: one or two sentences summarizing the basis for the classification; paraphrase or quote key phrases succinctly.

- Notes: Mentions that AI cannot be listed as an author should be treated as background and MUST NOT change the four-class decision. If the text only addresses peer review/editors' use of AI but not authors, classify as "Not Mentioned." When multiple statements exist, prioritize explicit requirements about AUTHORS' use in writing.

Output format (STRICT): Return ONLY a JSON object with fields:

{"category": one of ["Strict Prohibition", "Open", "Disclosure Required", "Not Mentioned"], "disclosure_location": <free text or empty string>, "reason": <short justification>}

AI disclosure recognition prompt

You are an expert in academic publishing ethics. Please analyze the following text to identify any disclosure of AI tool usage in academic writing.

CRITERIA:

1. Focus exclusively on authors' statements about using AI tools (e.g., ChatGPT, GPT-4, Claude, Gemini, Copilot) for writing assistance, editing, or grammar correction.

2. Exclude cases where the paper merely researches AI tools without author usage disclosure.

3. Distinguish between AI tools and human names (e.g., Claude Smith).

4. Ignore standard methodological statements (e.g., "BERT was used for text classification").

REQUIRED OUTPUT FORMAT (STRICT JSON):

```
{
disclosure_present: true/false,
disclosure_location: Methods section/Acknowledgements/Cover letter/Title page/End-of-
manuscript/Submission system/Other [specify],
ai_tools_mentioned: [tool1, tool2, ...],
usage_purpose: writing assistance/editing/grammar correction/content
generation/translation/other,
rationale: brief explanation for the classification
}
```

ANALYSIS GUIDELINES: Infer disclosure location from context and typical academic writing conventions. Extract specific AI tool names when explicitly mentioned. Classify usage purpose based on described activities. Base all conclusions on the actual text content, not on the examples provided above. Provide concise but informative rationale.

Figures

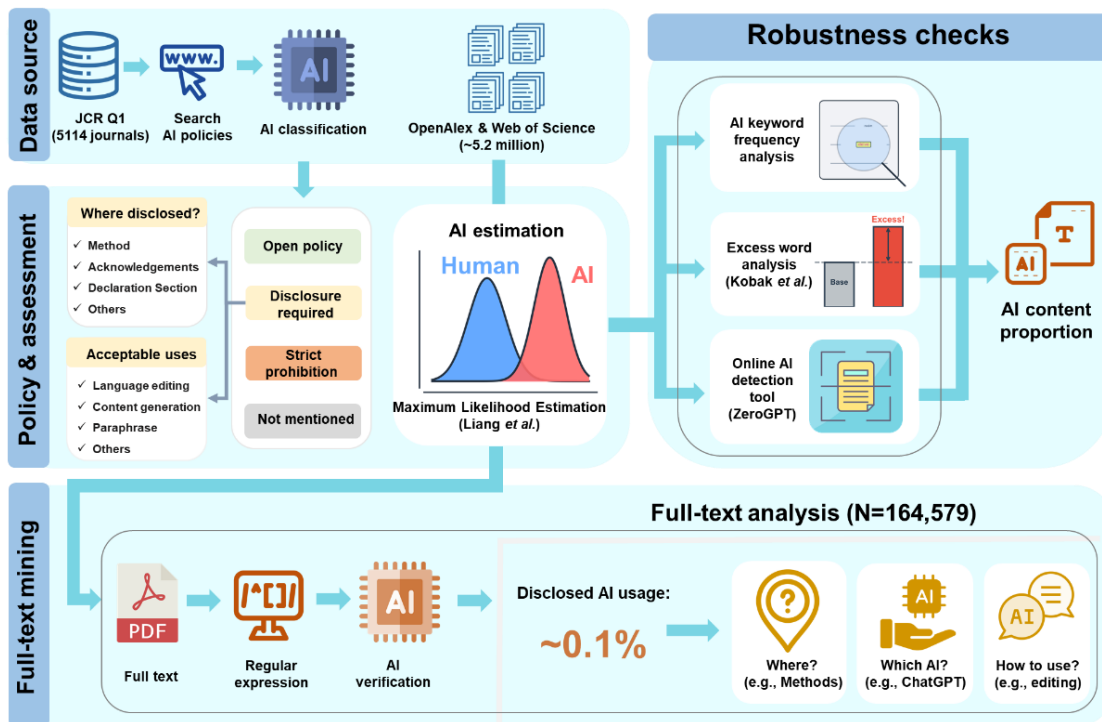


Fig. S1. The workflow comprises three main stages: **Stage 1: Data source and policy classification.** We analyzed 5,114 JCR Q1 journals and 5.2 million papers (abstracts) retrieved from OpenAlex and Web of Science ([Materials and Methods](#)). Journal AI policies were retrieved and classified into four categories (namely strict prohibition, open policy, disclosure required, and not mentioned) using large language models. **Stage 2: AI content estimation and robustness checks.** The primary estimation of AI content in abstracts was conducted using the Maximum Likelihood Estimation method following Liang *et al.* (4). To ensure reliability, three robustness checks were employed: AI keyword frequency analysis, excess word analysis following Kobak *et al.* (5), and independent verification using an online detection tool (ZeroGPT (6)). **Stage 3: Full-text mining.** A subset of 164,579 full-text PDFs was analyzed to estimate the rate of explicit AI disclosure. Using regular expressions and AI verification, we identified an overall disclosure rate of approximately 0.1% and extracted details regarding disclosure location (e.g., Methods), specific tools used (e.g., ChatGPT), and usage purposes (e.g., editing).

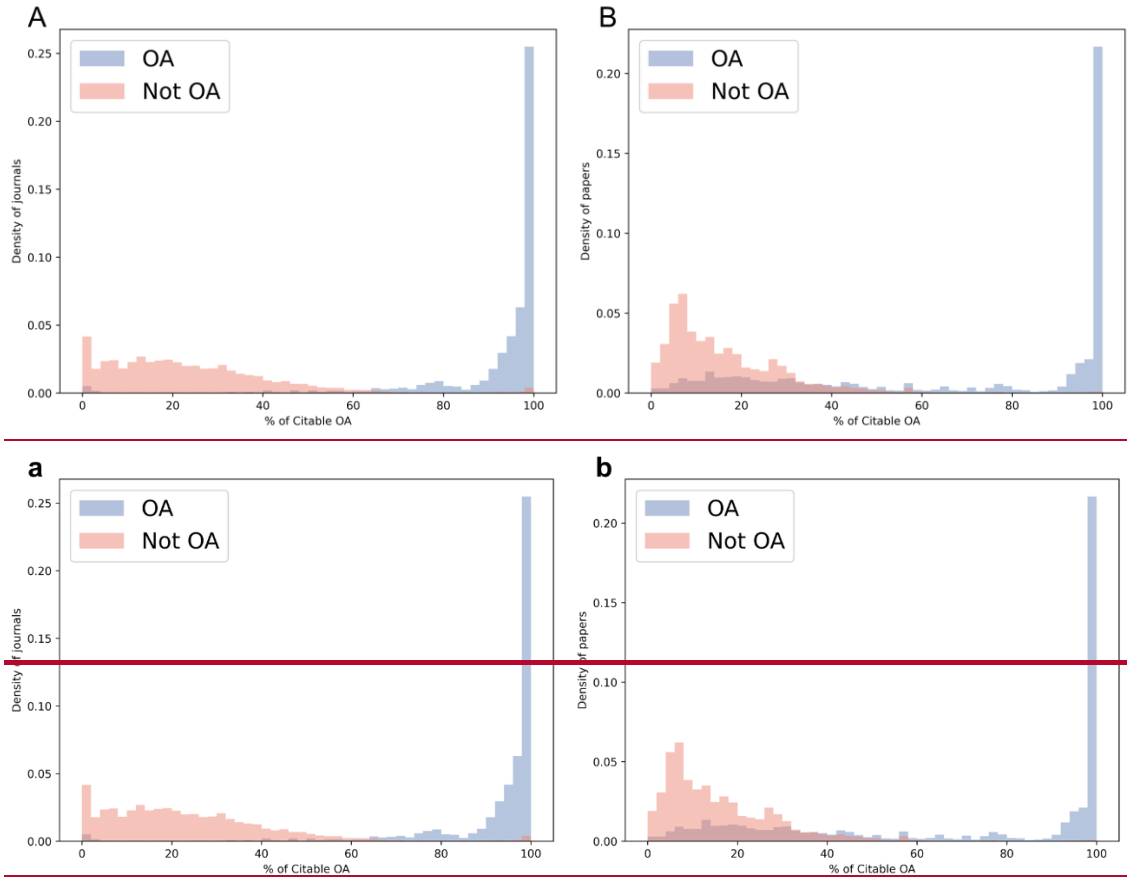


Fig. S2. Validation of OA classification strategy based on JCR metrics. **a**, Distribution at the journal level. Journals identified as Open Access by OpenAlex (blue) are predominantly clustered in the region where the “% of Citable OA” (the horizontal axis) exceeds 50%, while non-OA journals (red) are concentrated in the lower percentage region. **b**, Distribution at the publication level. The distribution pattern remains consistent when analyzing individual publications, with a clear separation between OA and non-OA publications. Descriptive statistics are shown in [Tables S7 and S8](#).

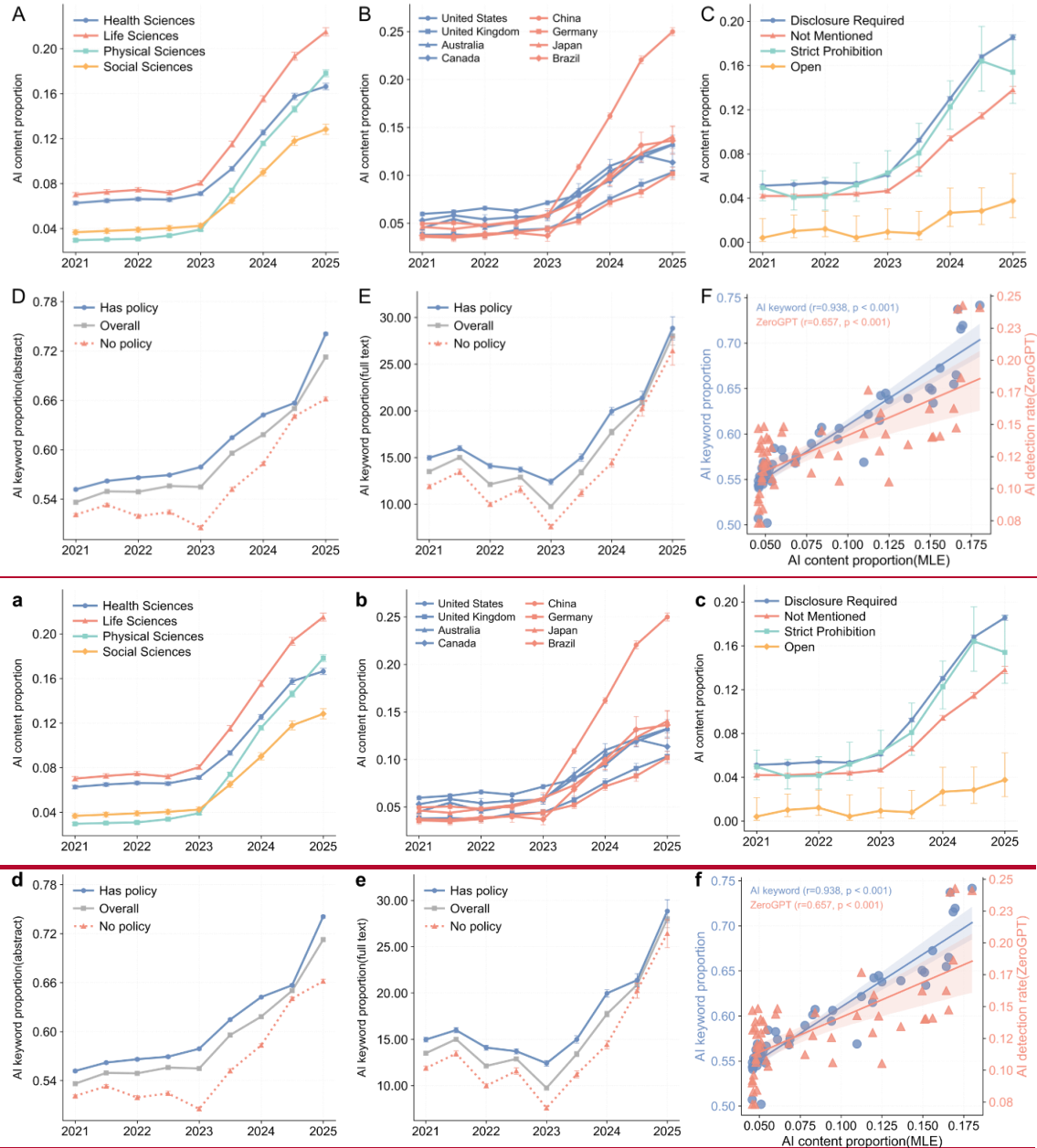


Fig. S3. Temporal trends and correlations of AI content detection across multiple dimensions. **a**, AI content proportion trends by academic domain from 2021 to 2025 across Health Sciences, Life Sciences, Physical Sciences, and Social Sciences. **b**, AI content proportion trends by language background, comparing English-speaking countries (e.g., U.S., U.K., Australia, Canada) and non-English-speaking countries (e.g., China, Germany, Japan, Brazil). Red lines represent non-English-speaking countries, and blue lines represent English-speaking countries, with distinct markers for individual nations. **c**, AI content proportion trends by journal AI policy categories, including disclosure required, not mentioned, strict prohibition, and open policies. **d**, AI keyword proportion trends in abstract by journal policy status, comparing journals with AI policies, overall average, and journals without policies. **e**, AI keyword proportion trends in full text by journal policy status. **f**, Correlation between AI keyword detection and MLE-based AI content detection methods, with ZeroGPT validation results shown as a secondary comparison.

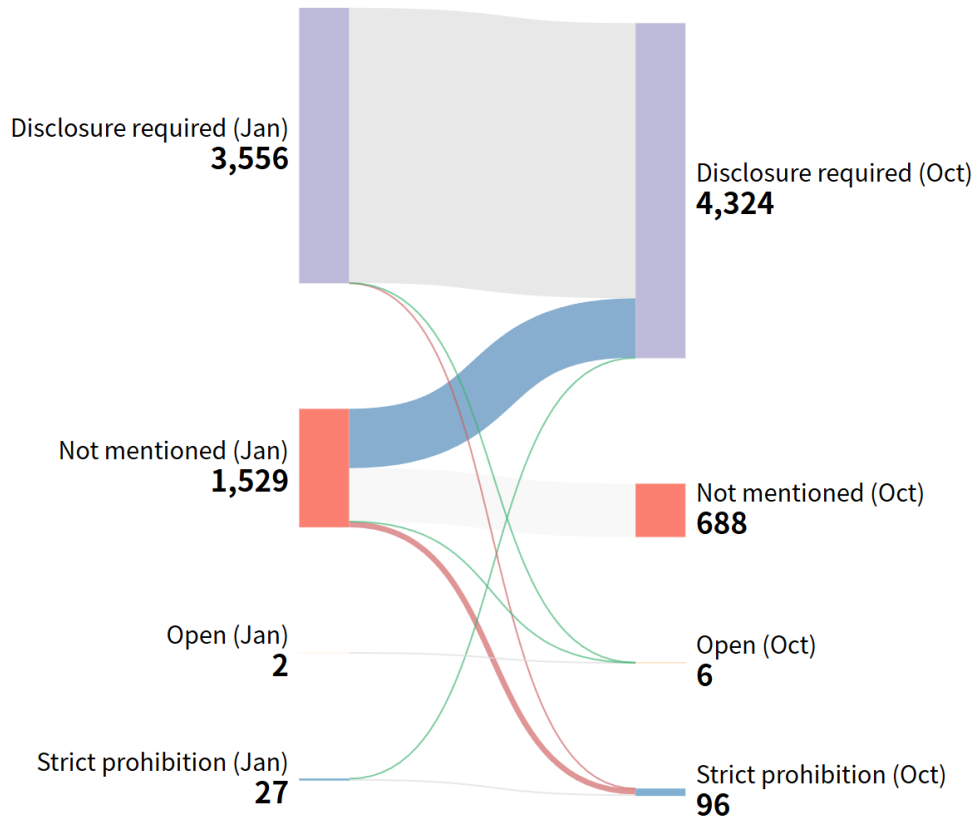


Fig. S4. Changes in journal AI policies between January 2025 (left) and October 2025 (right). This Sankey diagram visualizes the flow of policy changes among the 5,114 analyzed journals over a nine-month period.

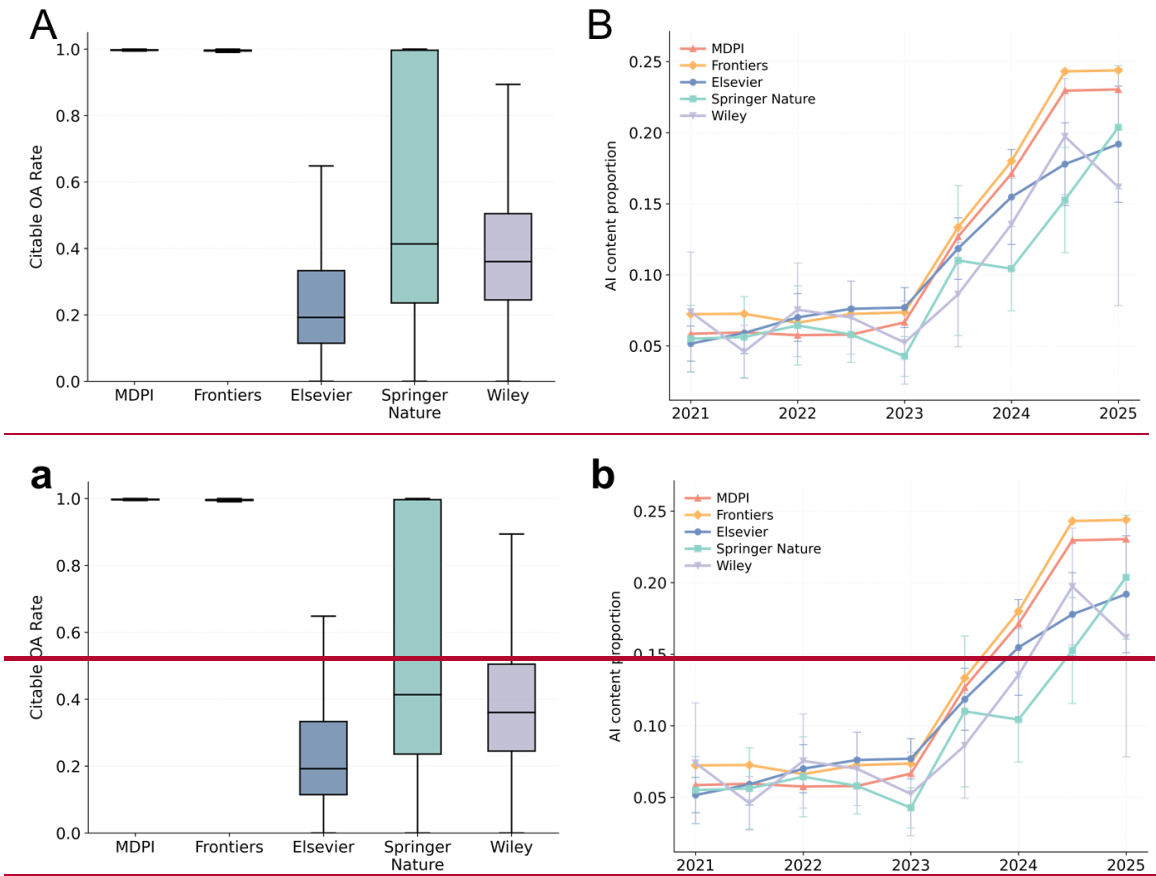


Fig. S5. Comparison of OA and AI usage trends across major publishers. **a**, Distribution of OA rates for five representative publishers (MDPI, Frontiers, Elsevier, Springer Nature, and Wiley). **b**, Temporal evolution of AI content proportion for these publishers from 2021 to 2025. Error bars represent 95% confidence intervals.

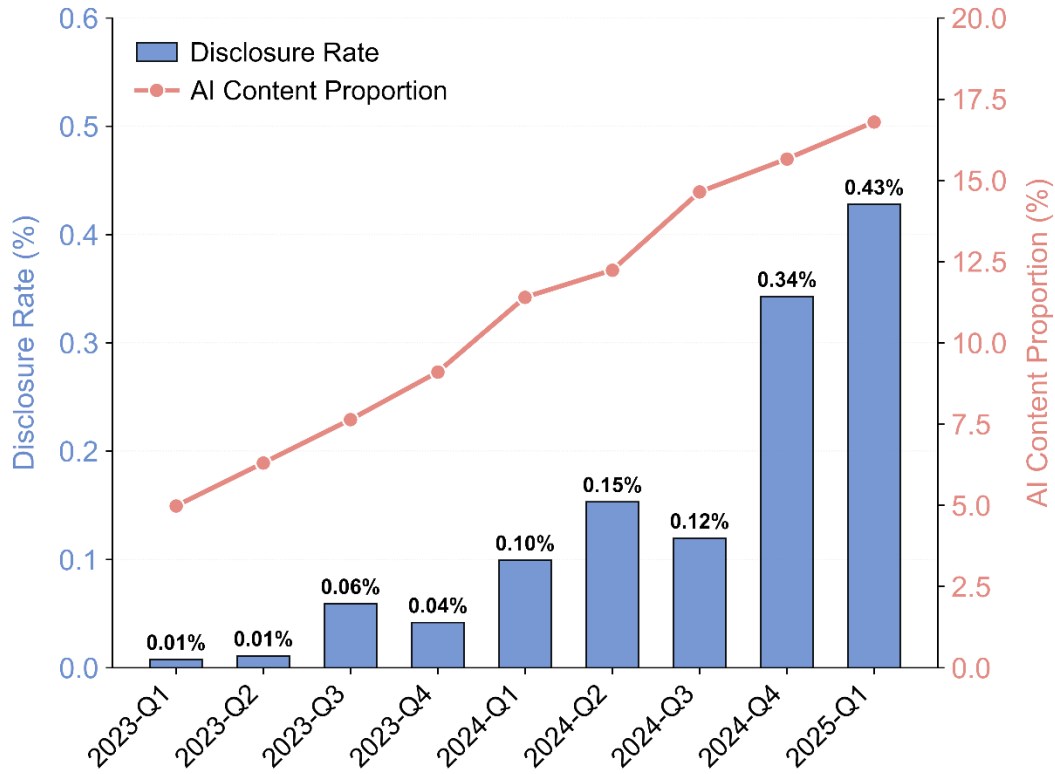


Fig. S6. Comparison of AI disclosure rate and estimated AI usage (2023–2025). The blue bars (left vertical axis) represent the percentage of full-text papers explicitly disclosing the use of AI tools. The red line (right vertical axis) indicates the overall AI content proportion.

Tables

Table S1. Examples of journal AI policies. The policy information presented was reviewed and recorded in January 2025.

Policy type	Journal	Policy text
Open policy	Journal of Educational Evaluation for Health Professions	“The main difference from other journal publishers is that the Journal of Educational Evaluation for Health Professions (JEEHP) does not ask authors to disclose the use of AI tools. The reason for this is that the editorial office is not able to screen the use of AI tools consistently...”
Open policy	Journal of the Association of Environmental and Resource Economists	“Authors of papers are responsible for all content in their papers. That means the authors are solely responsible for coding errors, incorrect facts or plagiarized text arising from the use of generative AI. While it is not appropriate to cite generative AI or include such bots as co-authors, authors may include an optional disclosure statement if they want to.”
Strict prohibition	Annals of Mathematics	“The Annals of Mathematics does not consider papers generated using AI products. Only individuals who can take full responsibility for the contents of a submission can be named authors.”
Strict prohibition	Journal of Numerical Mathematics	“Please note that we do not accept papers that are generated by Artificial Intelligence (AI) or Machine Learning Tools primarily because such tools cannot take responsibility for the submitted work and therefore cannot be considered as authors.”
Disclosure required	Journal of World Prehistory	“Authors who use AI tools in the writing of a manuscript, production of images or graphical elements of the paper, or in the collection and analysis of data, must be transparent in disclosing in the Materials and Methods (or similar section) of the paper how the AI tool was used and which tool was used. Authors are fully responsible for the content of their manuscript, even those parts produced by an AI tool, and are thus liable for any breach of publication ethics.”
Disclosure required	Active Learning in Higher Education	“Disclosure: As outlined above you must clearly reveal any AI-generated content within your submission. Detail where the AI-generated content appears, using the disclosure template found at the end of these guidelines and provide this disclosure along with your submission.”

Table S2. Sources of AI-characteristic keywords.

Validation source	AI-characteristic keywords
GPTZero (6)	delve, innovative, meticulous, pivotal, underscore, bolster, commendable, intricate, realm,
Grammarly (7)	revolutionize, shed, transformative, advancement, emphasize, endeavor, enhance, groundbreaking, harness, interplay, invaluable, multifaceted, noteworthy, nuanced, offer, renowned, seamless,
Delving into PubMed records: some terms in medical writing have 3 drastically changed after the arrival of ChatGPT (8)	strategically, streamline, unravel, valuable, comprehensive, vital, profound, adept, align, avenue, broader, burgeon, capability, compelling, comprehend, contribute, demonstrate, distinctive, elevate, elucidate, employ, encompass, endure, exceptional, explore, facilitate, foster, foundational, garner, grapple, groundwork, illuminate, imperative, inadequately, influence, inherent, integration, interconnectedness, intricacy, juxtapose, leverage, notable, nuance, pave, pioneer, poised, pose, predominantly, recognize, refine, remarkable, showcase, surpass, typically, ultimately, unlock, unparalleled, unveil, uphold, utilize, insight, significant, unwavering, crucial, highlight, importance, deeper, perspective, essential, cutting-edge, tapestry, impressively, prowess, holistic, embark, notably, seamlessly, excellently, scholarly, meticulously, tangible, methodical, fascinating, intriguing
Delving into LLM-assisted writing in biomedical publications through excess vocabulary (5)	
ChatGPT “contamination”: estimating the prevalence of LLMs in the scholarly literature (9)	
Delving into the Utilisation of ChatGPT in Scientific Publications in Astronomy (10)	

Table S3. Proportional distribution of the full-text sample across years, domains, countries, and OA status.

Dimension	Category	# of samples	Total count	Ratio (%)
Year	2021	46,591	1,389,504	3.35
	2022	42,816	1,406,298	3.05
	2023	40,497	1,465,309	2.76
	2024	30,162	1,616,880	1.87
	2025	4,513	826,920	0.55
Domain	Physical Sciences	42,897	2,676,480	1.6
	Health Sciences	56,131	2,050,465	2.74
	Life Sciences	37,367	1,164,693	3.21
	Social Sciences	19,689	736,435	2.67
Country	CN	30,713	1,742,099	1.76
	US	34,823	1,580,867	2.2
	GB	16,213	492,688	3.29
	DE	13,528	360,008	3.76
% of Citable OA	0%-25%	24,735	3,412,471	0.72
	26%-50%	21,756	1,237,841	1.76
	51%-75%	8,547	261,374	3.27
	76%-100%	109,541	1,793,225	6.11

Table S4. Differences in monthly growth rates (logarithmic increments) of AI content proportion between journals with and without AI policies using the Mann-Whitney U test.

Subgroup	mean growth (has_policy)	mean growth (no_policy)	U	p-value
Overall	0.042	0.059	411	0.722
By language				
English	0.077	-0.020	470	0.446
Non-English	0.089	0.152	408	0.852
By domain				
Social Science	0.038	0.049	417	0.963
Life Science	0.034	0.037	405	0.816
Physical Sciences	0.054	0.056	405	0.816
Health Sciences	0.031	0.024	456	0.586
By OA status				
High OA	0.041	0.046	403	0.792
Low OA	0.042	0.037	410	0.876

Table S5. Regular expressions used for PDF parsing.

Category	Target/Section	Regular expression pattern
Text cleaning	References removal	(references bibliography)s*\n.*?(\$ Z)
	Metadata (Header/footer)	\n\s*d+\s*\n (Page numbers)
		\n.{0,50}Vol\s*\d+.{0,30}\n (Volume info)
		\n.{0,50}20\d{2}.\{0,30}\n (Year info)
	URLs & DOIs	doi:\s*10\.\d+/\S+
		https?://\S+
	Format normalization	{2,} (Multiple spaces)
\n{3,} (Excessive newlines)		
Structure segmentation	Introduction	(introduction preface)[\s.:]*
	Methods / experimental	method(s ology)?[\s.:]*
		experimental[\s\w]*section
		materials[\s\w]*(and &)[\s\w]*methods
	Ethics & disclosure	ethic(s al)?[\s\w]*statement
		disclosure(s)?[\s.:]*
		declaration[\s\w]*of[\s\w]*interest(s)?
	Acknowledgements/funding	acknowledge[a-z]*[\s.:]*
		funding[\s.:]*
		grant(s)?[\s.:]*
	AI declaration	(ai llm)[\s\w]*
		(declaration statement disclosure)
	Figure captions	figure[\s\w]*caption(s)?
figure[\s\w]*legend(s)?		

Table S6. Keywords and regular expressions related to AI disclosure.

Category	Sub-category	Keywords or regex patterns
AI terminology	LLM families	\b(gpt(-[34]\.?[5])?) gpt[34] chatgpt claude(-\d)? anthropic bard gemini palm(-2)? llama(-\d)? meta\s+ai mistral mixtral falcon openai microsoft\s+copilot bing\s+(chat ai))\b
	General terms	\b(large\s+language\s+model llm language\s+model generative\s+ai foundation\s+model ai(\s+writing)?\s+assistant ai\s+tool generative\s+model)\b
	Writing tools	\b(grammarly quillbot writesonic jasper copy.ai wordtune hemingway paperpal scite trinka writefull scholarcy scispace elicit)\b
Disclosure patterns	Active declaration	(used utilized employed leveraged applied)[\s\w]{0,30}(ai artificial\s+intelligence language\s+model llm generative assistant)
		(assisted supported aided helped generated created drafted written edited revised proofread)[\s\w]{0,30}(by with using)[\s\w]{0,30}(ai artificial\s+intelligence language\s+model llm generative assistant)
	Passive declaration	(ai artificial\s+intelligence language\s+model llm generative assistant)[\s\w]{0,30}(was were has\s+been have\s+been)[\s\w]{0,30}(used utilized employed leveraged applied)
		(manuscript text writing draft paper article content language grammar)[\s\w]{0,30}(was were has\s+been have\s+been)[\s\w]{0,30}(assisted supported generated checked improved enhanced refined)[\s\w]{0,30}(by with using)[\s\w]{0,30}(ai artificial\s+intelligence language\s+model llm generative assistant)
	Acknowledgment	(acknowledg thank gratitude grateful)[\s\w]{0,50}(ai artificial\s+intelligence language\s+model llm generative assistant)
		(acknowledg thank gratitude grateful)[\s\w]{0,50}(support assistance help contribution)[\s\w]{0,30}(from by of)[\s\w]{0,30}(ai artificial\s+intelligence language\s+model llm generative assistant)
	Explicit statement	this[\s\w]{0,20}(paper manuscript article research study work)[\s\w]{0,30}(uses used utilizes utilized)[\s\w]{0,30}(ai artificial\s+intelligence language\s+model llm generative assistant)
this[\s\w]{0,20}(paper manuscript article research study work)[\s\w]{0,30}(is was has\s+been)[\s\w]{0,30}(ai-assisted ai-generated ai-written ai-enhanced)		
Negative statement	(no not)[\s\w]{0,20}(ai artificial\s+intelligence language\s+model llm generative assistant)[\s\w]{0,30}(was were)[\s\w]{0,30}(used utilized employed)	
	(did\s+not didn't have\s+not haven't)[\s\w]{0,20}(use employ utilize)[\s\w]{0,30}(ai artificial\s+intelligence language\s+model llm generative assistant)	
Other statements	(only just specifically)[\s\w]{0,30}(used utilized employed)[\s\w]{0,30}(ai artificial\s+intelligence language\s+model llm generative assistant)[\s\w]{0,30}(for to)	
	(ai artificial\s+intelligence language\s+model llm generative assistant)[\s\w]{0,30}(was were)[\s\w]{0,30}(only just specifically)[\s\w]{0,30}(used utilized employed)[\s\w]{0,30}(for to)	

Table S7. Cross-validation of journal open access status between JCR and OpenAlex.

JCR: % of Citable OA	OpenAlex classification	
	Non-OA journals	OA journals
0%-25%	2,310 (45.08%)	25 (0.49%)
26%-50%	1,252 (24.43%)	23 (0.45%)
51%-75%	216 (4.22%)	70 (1.37%)
76%-100%	77 (1.50%)	1,151 (22.46%)

Table S8. Cross-validation of publication open access status between JCR and OpenAlex.

JCR: % of Citable OA	OpenAlex classification	
	Non-OA publications	OA publications
0%-25%	1,942,393 (37.10%)	562,707 (10.75%)
26%-50%	472,238 (9.02%)	407,891 (7.79%)
51%-75%	48,531 (0.93%)	171,779 (3.28%)
76%-100%	23,083 (0.44%)	1,606,390 (30.69%)

Table S9. List of domains used for filtering during the process of obtaining journal homepage URLs.

Category	List of domains (ordered alphabetically)
Publishers	academic.oup.com, acm.org, aip.org, amegroups.com, bjournals.org, cambridge.org, cell.com, elsevier.com, frontiersin.org, hindawi.com, ieee.org, iop.org, journals.aps.org, kluweronline.com, mdpi.com, nature.com, oup.com, oxfordjournals.org, rsc.org, sagepub.com, sciencedirect.com, springer.com, tandfonline.com, wiley.com
Non-publisher webpages	baike.baidu.com, cnki.net, core.ac.uk, crossref.org, dblp.org, issn.org, readcube.com, researchgate.net, scholar.google.com, sci-hub, scimagojr.com, semanticscholar.org, wanfangdata.com, wikipedia.org, worldcat.org

SI References

1. Serper - The World's Fastest and Cheapest Google Search API. Available at: <https://serper.dev/> [Accessed 4 December 2025].
2. UncleCode, Crawl4AI: Open-source LLM Friendly Web Crawler & Scraper. *GitHub Repository* (2024). Deposited 2024.
3. J. Priem, H. Piwowar, R. Orr, OpenAlex: A fully-open index of scholarly works, authors, venues, institutions, and concepts. [Preprint] (2022). Available at: <http://arxiv.org/abs/2205.01833> [Accessed 4 December 2025].
4. W. Liang, *et al.*, Quantifying large language model usage in scientific papers. *Nature Human Behaviour* 1–11 (2025).
5. D. Kobak, R. González-Márquez, E.-Á. Horvát, J. Lause, Delving into LLM-assisted writing in biomedical publications through excess vocabulary. *Sci. Adv.* **11**, eadt3813 (2025).
6. AI Detector - Trusted AI Checker for ChatGPT, GPT5 & Gemini. Available at: <https://www.zerogpt.com/> [Accessed 4 December 2025].
7. Artificial Intelligence (AI) at Grammarly. Available at: <https://www.grammarly.com/ai?msocid=31b0c6425f816dda3ce5d0e15e0f6c61> [Accessed 4 December 2025].
8. K. Matsui, Delving into PubMed records: Some terms in medical writing have drastically changed after the arrival of ChatGPT. *MedRxiv* 2024–05 (2024).
9. A. Gray, ChatGPT “contamination”: estimating the prevalence of LLMs in the scholarly literature. [Preprint] (2024). Available at: <http://arxiv.org/abs/2403.16887> [Accessed 2 December 2025].
10. S. Astarita, S. Kruk, J. Reerink, P. Gómez, Delving into the Utilisation of ChatGPT in Scientific Publications in Astronomy. (2024). <https://doi.org/10.5281/zenodo.13885576>.