Editorial

Artificial Intelligence encounters of the generative kind: Rethinking knowledge, ethics, and research

Juan D. Machin-Mastromatteo

https://orcid.org/0000-0003-4884-0474

Universidad Autónoma de Chihuahua, Mexico

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Abstract

This editorial introduces a special issue featuring 31 contributions that explore the intersections between Artificial Intelligence (AI) and adjacent fields, including education, healthcare, library and information science, organizational development, psychology, agriculture, and cultural studies. These represent a wide range of theoretical, methodological, applied, and socially engaged perspectives, organized into five thematic sections: 1) libraries, archives, and information professionals; 2) users; 3) researchers and implications for training researchers; 4) education and learning; and 5) organizations, other implementations and development. In addition to summarizing the key insights of the included articles, I reflect on my unexpected journey into AI-related research and conferences to provide additional comments. This special issue also forms part of that ongoing engagement. My reflections are structured into six overarching themes: 1) the main contributions of the articles in this special issue; 2) trust, adoption, and the transformation of human–AI ecosystems; 3) AI in education; 4) AI and literacies; 5) ethics, hallucinations, and academic integrity; and 6) perspectives for future research on AI. As a conclusion, I outline four possible scenarios for AI's near future: regulated and human-centered AI ecosystems; localized AI for development and inclusion; embedded AI in learning and knowledge; and unregulated acceleration and social fragmentation. These reflections aim to provide a guide to the special issue and can be helpful for researchers, practitioners, and institutions navigating the rapidly evolving AI landscape.

Keywords: generative artificial intelligence, research practices, academic integrity, education and learning, libraries and archives, artificial intelligence literacy, trust, adoption.

Introduction

This special issue collects a rich blend of theoretical, methodological, applied, and socially relevant advances in the field of Artificial Intelligence (AI) and its intersections with adjacent disciplines. The 31 contributions collected here deal with Generative AI, reflecting the worldwide interest that such technologies have generated across various scientific disciplines and societal spheres. As they are very diverse, you will find them organized into five thematic sections:

Libraries, archives, and information professionals

1. Unlocking potential: The role of AI literacy and creativity in medical librarians' task performance in Pakistan.
2. Adopting artificial intelligence for health information literacy: A literature review.
3. Factors influencing the adoption of artificial intelligence in libraries: A systematic literature review.
4. Contributory factors to attitudes towards the adoption of artificial intelligence technology in public academic libraries in South Africa.
5. Developing smart archives in society 5.0: Leveraging artificial intelligence for managing audiovisual archives in Africa.
6. The use of artificial intelligence in university libraries in Türkiye: Practices, and perspectives of library directors.

Users

7. Determinants of Chatbot adoption among older adults: An extended TAM approach using PLS-SEM.
8. Understanding ChatGPT continuous usage intention: The role of information quality, information usefulness, and source trust.
9. Examining user switching intention between generative AI platforms: A push-pull-mooring perspective.
10. Impact of artificial intelligence-enabled service quality on user consumption value and continuous intention to use mobile fitness applications: Evidence from China.

Researchers and implications for training researchers

11. Perceptions of effectiveness and ethical use of AI tools in academic writing: A study Among PhD scholars in India.
12. What motivates academics in Egypt toward generative AI tools? An integrated model of TAM, SCT, UTAUT2, perceived ethics, and academic integrity.

13. Exploring the usage demands of AIGC functions among Chinese researchers: A study based on the KANO model.
14. Artificial intelligence and academic integrity: The role of academic librarians.

Education and learning

15. The impact of artificial intelligence in enhancing online learning platform effectiveness in higher education.
16. Effect of AI literacy on online information search competencies among medical students in Pakistan.
17. Investigating the effect of artificial intelligence in education (AIEd) on learning achievement: A meta-analysis and research synthesis.
18. Awareness, knowledge, and attitude towards artificial intelligence: Perspective of medical students in Ghana.
19. Acceptance and use of artificial intelligence and AI-based applications in education: A meta-analysis and future direction.
20. Decoding the ChatGPT mystery: A comprehensive exploration of factors driving AI language model adoption.
21. Predicting academic performance of students with machine learning.
22. Conceptualizing pre-service teachers' artificial intelligence readiness and examining its relationship with various variables
23. Transforming Behavioral Intention and Academic Performance: ChatGPT-4.0 Insights Through SEM, ANN, and cIPMA Analysis.

Organizations, other implementations and development

24. The impact of AI-driven music production software on the economics of the music industry.
25. Machines think, but do we? Embracing AI in flat organizations: Challenges of technological change in women-owned manufacturing firms.
26. Core problems in information systems implementation: An analytical review and implications for AI systems.
27. Human-AI interaction: Augmenting decision-making for IT leader’s project selection.
28. Artificial intelligence in developing countries: The impact of generative artificial intelligence (AI) technologies for development.
29. The critical determinants impacting artificial intelligence adoption at the organizational level.
30. Information quality of conversational agents in healthcare.

31. Improved information dissemination services for the agricultural sector in Thailand: development and evaluation of a machine learning based rice crop yield prediction system.

In this editorial, I take the opportunity to summarize the insights from these contributions, together with some of my comments drawn from my own experience with this topic. Curiously, since the massive popularization of *chatbots*, I had not initially expected to engage with this topic or conduct research about it. Unexpectedly, since 2023, I have been invited to provide numerous talks, seminars, and participate in research and publications regarding AI, with a primary focus on its implications for education, literacy, research and publishing; hence, I have mostly been encouraged by others to incorporate AI into my lines of research. Now, this special issue is also part of my contributions to the topic. I hope that this collection of notes, as well as this special issue, will be interesting and valuable.

Main contributions of the articles in this special issue

The articles in this special issue present novel frameworks, propose empirical models with practical relevance, extend existing theories to new contexts, and offer concrete solutions for real-world problems that might be tackled with the use of AI. They also bridge gaps among disciplines and between theory and practice, as evidenced in the interdisciplinary approaches underpinning many of the contributions, which combine insights from education, healthcare, library and information science, organizational development, psychology, agriculture, and cultural studies.

By aligning AI applications with domain-specific challenges, the articles highlight how interdisciplinary collaborations may enhance the societal, institutional, and epistemic relevance of AI research. Embedding AI tools within various professional disciplines yields context-sensitive innovations that may support development goals and respond to local needs. The convergence of several conceptual frameworks (e.g., Technology Acceptance Model, Innovation Diffusion Theory, Self-Determination Theory) also reflects the theoretical synergies enabled by cross-sectoral dialogue.

The articles highlight the importance of multi-stakeholder engagement (e.g., educators, policymakers, information professionals, and computer scientists). Such a collaborative ethos strengthens AI implementation strategies, as well as its governance, ethics, and sustainability. Interdisciplinary studies tend to employ hybrid designs, which can improve analytical depth and broaden the applicability of their findings. Hence, interdisciplinary and cross-sectoral synergies emerge as a strategic strength. They

enable the co-production of knowledge, support methodological innovation, and foster relevance across academic, institutional, and policy contexts.

Regarding their theoretical contributions, you will find that several articles offer useful theoretical advancements by developing or extending frameworks that help explain the mechanisms underpinning user interactions with AI systems, as well as the institutional readiness needed to apply them (e.g., funding gaps, infrastructure conditions or deficiencies, and resistance to change within organizations), their educational outcomes, or sectoral adoptions. Some established models, such as the Technology Acceptance Model, the Unified Theory of Acceptance and Use of Technology, the Information System Success Model, and the Information Processing Theory, have been implemented to study AI adoption in contexts such as healthcare, education, and libraries. Moreover, the development of conceptual models necessary for conducting further research into AI applications must incorporate social and psychological variables, such as AI-enhanced innovation, AI self-efficacy, and perceived anthropomorphism.

Methodologically, the best proposals stand out due to their rigorous and novel approaches, which allow for robust data interpretation and replicability. The most popular statistical methods involved in AI-related research include Partial Least Squares Structural Equation Modeling, Artificial Neural Networks, and Combined Importance-Performance Map Analysis. Moreover, an approach that may show promise is the deployment of comparative analyses across machine learning models (e.g., Support Vector Machine, Neural Network and Ensemble Models), which can be used for dissimilar purposes such as predicting educational or agricultural outcomes.

The articles in this special issue illustrate the development and implementation of metrics and task-specific indicators for capturing user experiences and system performance (e.g., perceived interactivity, personalization, and anthropomorphism), which are relevant measuring elements in *chatbot* studies. The effectiveness and trustworthiness of domain-sensitive evaluation frameworks may depend on the context, for instance: 1) health-related studies employ systematic approaches for evaluating information quality and engagement with chatbots; 2) agricultural research uses big data metrics for assessing prediction accuracy and computational efficiency; 3) libraries and archives employ models based on transformation readiness, innovation support, and satisfaction levels of both librarians and users; and 4) in management, organizational decision-making frameworks are integrated for examining strategic alignment, perceived threats, and leadership support. These frameworks integrate ethical and usability dimensions, the former includes criteria such as informed consent,

academic integrity, and user agency; while user-centric and usability models consider human factors (e.g., digital divides and language barriers) for ensuring local appropriateness and inclusivity. Such multidimensional approaches can provide relevant contributions toward AI systems' responsible design, implementation, and evaluation.

AI research readily and clearly demonstrates real-world applicability in a wide range of sectors (e.g., education, health, libraries, agriculture, and the creative industries) and focuses (individual users and institutional systems). Some examples that you will find in this special issue include cases around: 1) the design and testing of chatbot platforms; 2) their integration in online learning environments; 3) AI-enabled apps; 4) music composition, specifically human-AI collaboration for composition, which may yield higher profitability and no doubt will drive heated discussions around their value, originality and ethics; 5) health information literacy; 6) academic integrity; 7) recommendations for designing inclusive and user-centered interfaces with high information quality and accessibility, stressing the importance of users' experience, especially for older adults and underrepresented communities; 8) policy-relevant insights on ethical AI use, user training needs, and regulatory challenges, which also emphasize investment needs in infrastructure, training, and change management to support sustained AI use, particularly in developing countries; 9) the development of AI literacy frameworks for students, teachers, and librarians, which highlight immediate implications for information practices; 10) agricultural AI, for developing predictive crop yield models that can contribute to food security and rural development; 11) AI implementations in education, such as using machine learning and generative AI to personalize learning, predict academic performance, and enhance student engagement and satisfaction; 12) using AI-assisted tools (e.g., Grammarly or ChatGPT) to improve writing quality, especially for non-native English speakers, thus offering equitable support in scholarly communication; 13) organizational implementations, such as deploying decision-making frameworks for project selection and knowledge management; and 14) experiences in libraries and archives for aiding in cataloguing, classification, reference services, and digital archiving and preservation. These contributions emphasize equity, access, and the ethical integration of AI tools, while also considering cultural and local needs.

Trust, adoption, and the transformation of human–artificial intelligence ecosystems

Integrating AI systems in professional, educational, and organizational contexts brings forth discussions around user engagement, perceived intelligence, trust

mechanisms, and the balance between emotional and utilitarian design. Trust in AI is a multi-dimensional construct that can shape acceptance, reliance, and long-term integration. Moreover, the development of trust (or its absence) might affect the usability, effectiveness, and ethical acceptability of AI applications across sectors. The key insights surrounding human–AI interaction and trust include the following:

1) Perceived intelligence is a trust and engagement catalyst: users are more likely to trust the AI systems they perceive as *intelligent* and engage more deeply with them, especially if they exhibit human-like collaboration or problem-solving capabilities.
2) Interactivity and personalization are more important aspects than anthropomorphism: studies show that trust is more strongly associated with utilitarian features (e.g., interactivity and task support), rather than emotional features (i.e., human-likeness or anthropomorphism). Hence, even if an AI exhibits human-like traits, this is not enough to build trust, as users prioritize functional support, interactivity, personalization, and the system's competence over mimicry.
3) Transparency and explainability are seriously needed: more importance is being placed on AI systems' ability to explain their outputs clearly and understandably, especially in educational and decision-making contexts. More transparent systems might help users calibrate trust more effectively and reduce overreliance or unwarranted skepticism. This aligns with adoption research findings, which indicate that perceived fairness, transparency, and ethical alignment are crucial across sectors, not just for usability, but also for institutional and attitudinal alignment. Transparency is mostly needed in domains where AI mediates epistemic authority (i.e., where AI influences what is considered valid, reliable, or authoritative knowledge), requiring users to shift from passive recipients of information to interpreters and validators of algorithmic outputs.
4) Trust is undermined by issues related to privacy, control, and autonomy, especially if users feel that they are being surveilled or that the systems are making decisions without their oversight. Conversely, trust might increase if users perceive they have control over how systems are used and that their personal data is handled appropriately.
5) Trust gaps can stem from concerns over accuracy, bias, and ethical alignment in organizational and educational settings. Moreover, resistance to AI adoption may reflect anxieties around job displacement, system opacity, or ethical misuse. Such concerns are compounded in low-resource settings where the

digital divide (caused by infrastructural and financial deficits, limited human capital, and language barriers) can restrict equitable access to trustworthy AI systems. A successful adoption requires investing in localized infrastructure, context-aware interfaces, and culturally relevant adaptations to prevent exacerbating existing inequalities.

6) Repeated and positive exposure to AI systems builds trust over time, suggesting the importance of sustained engagement and thoughtful onboarding strategies from vendors or designers. Conversely, users unfamiliar with AI will tend to overestimate its capabilities or fear its implications, both of which will erode their trust in these systems. AI literacy initiatives may help bridge the gap between system capabilities and users' confidence.
7) Trust also depends on the system's ability to support learning processes, the feasibility of adjusting it with institutional values, as well as its precision, accountability, and alignment with regulatory, ethical or safety standards. Attitudes are shaped by users' familiarity, optimism, and self-perceived competence; hence, trust is a technical, psychological, and organizational issue. Moreover, information ecosystems are undergoing AI-driven transformations, which may support user personalization while shifting the structures of workflows and professional roles. At the same time, AI systems are being utilized as co-creators or decision-making partners, further complicating trust dynamics and necessitating the development of new and responsible governance mechanisms.
8) AI tools with a design based on trust will clearly communicate their boundaries and limitations, include responsive feedback mechanisms, and provide opportunities for users to contest or verify generated outputs. This principle can be observed in the adoption studies that emphasize ease of use, usefulness, and social influence as predictors of trust and long-term acceptance. AI has the potential to transform the architecture of information exchange, producing new feedback loops where user interaction could shape system behavior and vice versa. This co-evolution of human and AI roles challenges traditional hierarchies of knowledge and demands renewed attention to transparency, participatory design, and ethical adaptation.

The dynamics of trust are closely related to adoption behaviors across domains. While specific drivers may differ (e.g., strategic alignment in business, interpretability in healthcare, and personalization in education), trust is a socio-technical trait that is common across domains. It thrives if institutional readiness, infrastructure, capacity building, and user-centered design are appropriately implemented, because the path

toward trustworthy AI systems is technical, infrastructural, financial, informational, educational, and political. Furthermore, contextual fairness, inclusive design, and policy frameworks are necessary to ensure that AI adoption is both efficient and fair, representing diverse needs and capacities.

Artificial intelligence in education

The integration of AI in education has been a very popular line of research. The main interest so far in the overabundant literature of this application seems to be to provide empirical evidence and conceptual frameworks that demonstrate how AI technologies are positively or negatively influencing the way students learn, engage, and perform. The articles in this special issue provide some evidence around the following topics: 1) AI may enhance learning outcomes and academic achievement, particularly with chatbots, although its success might vary by educational level, discipline, and geography; 2) predictive machine learning models may be useful for early identifying students at-risk and hence enabling the development of interventions that improve retention and outcomes; 3) AI may be useful for developing personalized learning experiences based on learner profiles, that are able to promote engagement and knowledge retention, and offer real-time feedback and assessment, helping students monitor their progress and encouraging metacognitive strategies; 4) Grammarly and ChatGPT are increasingly used for writing support, demonstrating their value as assistive technologies in autonomous learning; 5) contextual and psychological factors may shape teachers' attitudes toward AI-enhanced innovation; and 6) lack of infrastructure, training, and internet access in some regions limits the full integration of AI tools into education and curricula.

Artificial intelligence and literacies

AI interacts with various forms of literacy, particularly information literacy, digital literacy, and data literacy, which are becoming integral parts of a newer one that we may call *AI literacy* or *algorithmic literacy*. A consistent narrative emerges: as AI systems become embedded in educational and information practices, the need for users to develop sophisticated literacy skills becomes more urgent. Moreover, different user groups (students, professors, librarians, and the general public) will encounter unique challenges and opportunities for developing these literacies.

The adoption and effective use of AI depend not only on technical access or system usability but on the user's capacity to navigate, interpret, and evaluate AI-generated content, while also being able to develop, modify, adapt, and evaluate deep and meaningful prompts for AI systems. AI literacy is starting to demand the integration

of an evolving set of competencies that is larger, more complex, intertwined, and holistic than any other previous form of literacy (e.g., information literacy, digital literacy, media literacy), in fact, it requires competencies that are more associated with the other literacies. Such a plethora of competencies is needed to work meaningfully with algorithmic systems, as it will enable users to conduct their AI-mediated activities by interactively modelling their workflows through back-and-forth interchanges and adjustments between inputs and outputs. We can simplify this by suggesting a four-step cycle of prompting: development, execution, evaluation, and reformulation, which will be as complex as required by: 1) the specific activity; 2) the user's expectations, information behavior and practices; and 3) the desired characteristics of the final result. Hopefully, a human intelligence layer will most often be applied to a generated output, which would imply its audit (which involves verification, evaluation, fact-checking, unbiasing), improvement, and further rewriting. A successful user will *know what they are doing* when using AI. For instance, a person should not pretend that ChatGPT will write an article for them, and then they will suddenly turn into a researcher. Although the usage of AI as a research tool is hotly debated nowadays and many publishers forbid its use for purposes other than proofreading, someone who wishes to use it in academic and research contexts must have at least fundamental knowledge about information sources, their characteristics, evaluation, and citation, as well as an understanding of research methods, academic writing and publishing, research ethics and integrity, the nature of claims in scholarly discourse, and the identification and management of intertextuality. Note that these basic topics are closely related to traditional literacies.

The articles in this special issue that deal with this specific topic help us further characterize AI literacy with the following traits: 1) it is a multiliteracy**,** in which digital, data, and information literacies converge, as each of them are essential to help users understand algorithmic decision-making, verify information, develop deep and meaningful prompts, and interpret and act upon AI outputs; 2) users' ability to maintain cognitive and meaningful engagement with AI systems (and with their outputs and the inputs that will improve such outputs) is one of its core components; 3) reasoning and evaluative abilities are essential to counter the passive consumption of AI outputs; 4) demographic differences (e.g., age, professional background, and prior literacy levels) will influence how users engage with AI systems, hence, as with other literacies, developing tailored approaches is necessary; 5) AI literacy, creativity and task performance are closely related, so they must be fostered in tandem; 6) most literate users are more adept at leveraging AI as a collaborative partner rather than a passive tool; 7) classic information quality attributes (accuracy, richness, timeliness, format, and

relevance) shape how users perceive the usefulness and trustworthiness of AI outputs; 8) AI literacy could relate to better online information searching and evaluation skills, highlighting the need of digital literacy and critical evaluation of sources; and 9) this literacy involves both understanding generated content, and also knowing how to contextualize and format it for a specific purpose.

Many AI users are learning to use these tools by themselves, partly because formal educational initiatives are still scarce, particularly in developing countries. However, we should consider that offering training is both a challenge and an opportunity that we should harness, because this technology has a dark side with negative potential. For instance, several studies and professionals warn us of a potential erosion of critical thinking skills due to over-reliance on these tools. Hence, librarians, educators, and students alike must educate themselves about the ethical and advanced usage of these tools and develop serious training initiatives. Currently, there are calls everywhere for formal training programs and curricula to support the development of AI literacy, and we can identify both educational institutions and libraries as critical spaces for developing pertinent workshops, courses, curricula, policies, and learning strategies.

Ethics, hallucinations, and academic integrity

Among the most urgent intersections between AI and scholarly practice, we can find ethical concerns, algorithmic hallucinations, biases, and academic integrity. The articles in this special issue reflect a consensus that a successful integration of AI depends on technical reliability and on ethical frameworks that guide its deployment in educational, professional, and public contexts. Ethical safeguards (e.g., consent procedures, informed use, ethical-by-design interfaces, transparency in data handling, accountability in their outputs, and respect toward human values, diversity, and equity) will influence users' willingness to adopt AI tools and are required to build and sustain trust in them. Ethical concerns range from the accuracy and transparency of algorithms to user privacy and consent.

Among the most pressing technical challenges in AI systems are hallucinations, which are the generation of plausible-sounding but false or fabricated information. Hallucinations represent a key limitation that intersects with ethical and epistemic risks: they undermine trust in AI outputs, demand the development of an AI literacy capable of detecting and triangulating generated content, and have led some libraries and institutions to slow down AI adoption until proper safeguards and validation mechanisms are in place.

Academic institutions face growing tensions between embracing AI as a learning aid and preventing its misuse, mainly because it may lead some users toward unethical academic shortcuts. Rather than solely relying on detection tools to determine if it was indiscriminately used, educators and librarians are encouraged to foster students' ethical reasoning, critical thinking, and AI literacy. There is an underlying issue about using AI indiscriminately for academic and research activities: its relationship with plagiarism. These tools can rephrase or generate text derived from their knowledge base, an online search, or from uploaded documents; however, many of the language models available today, especially their free versions, are unable to determine exactly where they obtained the ideas used to generate content and their authorship; and manually tracing, validating and identifying its sources is very difficult. Moreover, AI systems often provide references that appear plausible (i.e., with real author names, titles, journals, and formats) but refer to documents that do not exist. I like to call them *hallucinated references,* and they may be the most visible manifestation of AI-generated hallucinations in academic writing. This inability to verify the true origin of ideas or quotations presents a serious risk when such outputs are used in academic writing, as it may lead users to unintentionally commit plagiarism by reproducing content without traceable attribution. This problem might have even more serious consequences: if a document with hallucinated references is uploaded to a preprint server or published, it generates *bibliometric garbage* (i.e., creates records of non-existent documents and registers citations to them). Thus, AI makes us rethink the traditional boundaries of plagiarism; hence, updating academic integrity frameworks and institutional policies around these issues is urgent. There are specialized tools such as *SciSpace* or *Consensus* that can mitigate these risks by improving transparency and source attribution, but their limited accessibility (due to paywalls) and the fact that they require more advanced user skills make them less likely to be widely adopted by average users, who typically engage with AI through simple chatbot queries.

If it was already difficult to deal with plagiarism because its detection usually involves using software solutions that can derive in some harmful myths that are not helping to improve research integrity in our institutions (e.g., trusting an originality percentage and even set it as a parameter, when an expert and human revision of an originality report is needed to determine if there is plagiarism or not), detecting the indiscriminate use of AI is even more challenging. Current AI detection systems highlight suspicious fragments and assign a probability score, which is related to how likely it is that a text was generated by an AI. However, these scores are based on statistical inference, rather than verifiable or auditable evidence, so they are prone to false positives, which can result in unjustified sanctions and compromise academic

fairness. In addition, the increasing popularity of tools promoted on social media to *humanize* AI-generated content and evade detection is introducing new threats to research integrity. Some of these tools promise to make AI-written text indistinguishable from human writing, which, if not critically addressed, could seriously damage scholarly trust.

At least for now, before language models become even more sophisticated, *human intelligence* remains a more effective resource for detecting AI usage. Educators and reviewers can develop more accurate suspicions by identifying specific textual features that are typical of AI output. These include: 1) titles written with every word starting with a capital letter; 2) excessive use of colorful adjectives, which is uncommon and discouraged in scientific writing; 3) redundancy across nearby paragraphs, often due to the predictable structure of AI responses (introduction, development, and conclusion, with repetition at the beginning and end); 4) superficial or vague content that lacks analytical depth; 5) overuse of bullet points that begin with a title, followed by a redundant explanation; and 6) identifiable AI phrasing patterns or footprints that recur across its outputs (e.g., texts such as “as a language model…”, “regenerate response”, "here is an introduction for your text", or the mentioned abuse of adjectives). Rather than relying exclusively on imperfect AI-detection tools, whose probabilistic outputs lack precision and are very difficult to confirm, the ability to critically recognize these patterns, especially when based on hands-on experience with AI systems, may prove more reliable in mitigating their misuse in academic contexts.

Given these ethical concerns, please allow me to reiterate the need for librarians and teaching staff to be aware of them and respond appropriately, so that they can guide students in the ethical and productive use of AI, including understanding these issues of hallucinations, authorship ambiguity, citation practices and its relationship with plagiarism.

Despite our worries, AI is changing research practices because scholars are increasingly using it as a cognitive collaborator and to streamline repetitive tasks such as paraphrasing, summarizing, formatting citations and references, brainstorming hypotheses and other contents, and organizing literature reviews. These tools are praised for enhancing writing fluency and coherence, particularly by non-native English speakers and early-career researchers. AI may be enhancing scholarly publishing accessibility and reducing reliance on support services specializing in publishing, proofreading, and translation, which may be particularly relevant for under-resourced institutions and researchers from the Global South, who are often unable to afford such specialized services. However, tensions exist around the boundaries between

enhancement and originality, raising epistemological questions about authorship and scholarly expression. AI is also emerging as a methodological aid, helping in the construction of instruments, data interpretation, and qualitative analysis. These uses, however, are not permitted by the guidelines of major publishers, as they require critical oversight to avoid uncritical reliance and epistemic shortcuts. While AI democratizes access and accelerates research production, it simultaneously requires new frameworks for academic contribution, integrity, and ethical disclosure.

Perspectives for future research on artificial intelligence

With a highly dynamic topic such as AI, considering its future may be challenging due to its constant changes; however, it is relevant to summarize such projections, as they can aid academic continuity, evidence-based practices, and informed policy development. The articles in this special issue highlight the rapid evolution of these technologies and point toward the need for studying unexplored or emerging issues. As AI becomes increasingly integrated into different fields, researchers should investigate its context-specific applications and societal implications more deeply. As such, future research directions could include: 1) exploring contextual factors and user diversity across varied demographics and cultural settings, including vulnerable and underrepresented populations, to account for different literacies, motivations, and social norms that could influence AI adoption and outcomes; 2) incorporating longitudinal and mixed-method designs to assess impacts over time, such as tracking behavioral changes and learning outcomes mediated by AI tools; 3) deepening research about AI ethics, its regulations and governance, tackling subtopics such as bias, transparency, authorship, data privacy, ethical implications across sectors, regulatory models, and the long-term societal and educational consequences of delegating cognitive tasks to these tools; 4) establishing further interdisciplinary integrations, combining insights from information science, education, psychology, and computer science, which allow exploring and implementing hybrid systems combining human judgment with AI; 5) designing and optimizing interfaces to improve usability, accessibility, adaptability, explainability, trustworthiness, and alignment with users' values and goals; 6) assessing impact and policy relevance by producing actionable findings that can better inform institutional practices or public policies aimed at ensuring equitable access and mitigating digital divides.

Given the previous summary, we might be tempted to think about what the future of AI will bring. Without visiting the realm of science fiction but drawing from the wealth of content collected in this special issue, I can propose that we may witness the following four scenarios, which are not necessarily mutually exclusive. These are not

utopian or dystopian forecasts; they are framed with the awareness that AI development is not necessarily driven by philanthropic ideals, but rather by corporate financial interests, geopolitical agendas, and infrastructural asymmetries.

Scenario 1. Regulated and human-centered AI ecosystems

In this scenario, AI is implemented only after passing through rigorous ethical auditing protocols that are based on transparency, explainability, and user empowerment. AI research, development, and deployment are increasingly governed by emerging international standards and frameworks designed to protect user rights, minimize bias, and ensure accountability. However, some concerns might emerge depending on who draws those regulations, whether those stakeholders pursue concealed agendas or prioritize financial interests over societal ones, and whether these guidelines respond more to the financial interests of corporations and the agendas of supranational entities. Additionally, it is worth considering whether these frameworks prioritize financial and geopolitical interests over democratic accountability and justice. Professionals will act as critical supervisors of algorithmic decisions, while research will prioritize transparency, trustworthiness, explainability, and inclusive design. However, without inclusive and independent governance, this scenario risks becoming a rhetorical façade for technocratic control.

Scenario 2. Localized AI for development and inclusion

AI technologies are adapted to the cultural, linguistic, and infrastructural realities of diverse communities, particularly in the Global South. Rather than relying on imported solutions, institutions co-design applications with local stakeholders to: 1) address their specific needs, goals, and challenges across domains such as education, economic, agriculture, health, information, and governance; 2) foster institutional capacity and readiness for sustainable AI adoption; and 3) reduce, rather than reinforce, global inequities. The lines of research embrace participatory methodologies and comparative perspectives on technology adoption. This scenario depends on long-term support, policy alignment, and the political will to resist corporate dependencies.

Scenario 3. Embedded AI in learning and knowledge

AI is seamlessly integrated into lifelong learning, knowledge ecosystems and activities throughout individuals' lives (from early education to academic research, professional reskilling, and informing citizens). Both the usage of AI and research about it will center on using these technologies as cognitive partners in writing, inquiry, and reflection on human–machine co-creativity, learner autonomy, and the transformation

of epistemic practices, as well as developing processes and practices to foster the cultivation of critical thinking and creativity, while balancing human skills with AI's capabilities. Still, this vision depends on equal access to AI tools, which is unlikely unless public investment, open infrastructure, proper staff training, the development of institutional capabilities, and equitable design principles are explicitly pursued. Otherwise, Scenario 4 will be more plausible.

Scenario 4. Unregulated acceleration and social fragmentation

In this scenario, innovation outpaces ethical, institutional, and pedagogical safeguards. Without adequate literacy, regulation, or infrastructure, institutions and individuals are overwhelmed by AI unintended consequences, such as the overreliance on it, which aggravates today's issues surrounding academic integrity, surface-level learning, epistemic erosion, misinformation, and structural inequalities, which will deepen, as only those that can overcome various divides (i.e., digital, infrastructural, language, cognitive and financial) can meaningfully harness AI capabilities and have advantages over those who cannot. Meanwhile, open tools and grassroots innovation are either commodified or rendered obsolete, as corporate platforms monopolize access, acquire independent stakeholders, and lock relevant technological developments behind paywalls (this has already occurred). In this future, research will try to be a critical voice among the establishment's convictions that have enshrined AI, and thus it will center on analyzing the social and cognitive harm that AI has caused and will advocate for stronger regulatory and pedagogical counterbalances. The challenges historically visible in developing countries illustrate the costs of unaddressed divides. In this scenario, AI may not bridge these gaps. It will deepen them.