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Preface
AI in Digital and Applied Humanities: Reconfiguring Knowledge, Learning, and Human Agency

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Abstract

Artificial intelligence (AI) is changing how knowledge is produced, interpreted, shared, and applied. These changes raise questions about human agency, educational value, scientific integrity, and social equity. This special issue, AI in Digital and Applied Humanities, brings together six contributions that examine these changes in humanistic inquiry, higher education, metacognitive development, scholarly publishing, teacher competence, and human-AI collaboration. Drawing on conceptual analysis, mixed-methods research, exploratory educational intervention, critical commentary, and large-scale cross-national data, the contributions investigate how AI-mediated practices reshape epistemic authority, student engagement, self-regulated learning, research credibility, teacher readiness, and pedagogical design. Collectively, they highlight the tensions between technological efficiency and intellectual autonomy, automated knowledge production and scholarly accountability, and expanding AI capabilities and unequal institutional capacities. The review focuses on the risks of diminished critical thinking, unreliable or low-value scientific output, insufficient professional preparation, and inequitable access to AI-supported educational opportunities. At the same time, the contributions identify possibilities for strengthening metacognitive awareness, supporting personalized learning, improving educational decision-making, and fostering responsible human–AI collaboration. By integrating philosophical reflection with empirical evidence and conceptual frameworks, this special issue advances a human-centred, context-sensitive, and ethically grounded perspective on AI adoption. It argues that meaningful technological integration depends not simply on computational performance but on human judgment, pedagogical purpose, professional competence, transparent governance, and institutional accountability. The issue establishes an interdisciplinary basis for future research and policy aimed at ensuring that AI contributes to credible knowledge, authentic learning, and more equitable educational and scholarly environments.

Keywords*: Artificial intelligence; Digital and applied humanities; Generative AI; Human-AI collaboration; Educational equity; Research integrity.*

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1. Introduction

Artificial intelligence (AI) is reshaping intellectual life. Its effects go beyond technological innovation and reach the core processes by which knowledge is produced, interpreted, communicated, evaluated, and applied. The rapid development of generative AI (GenAI), large language models, intelligent learning environments, and automated analytical systems has renewed debates about the relationship between human and machine intelligence. These technologies challenge established assumptions about authorship, expertise, critical reasoning, teaching, scientific credibility, and institutional responsibility. The key question is therefore no longer whether AI can perform tasks associated with human cognition, but how its use changes the purposes, conditions, and responsibilities of intellectual and professional work.

This special issue, *AI in Digital and Applied Humanities*, brings together six contributions that examine the opportunities, limitations, and implications of AI in humanistic inquiry, higher education, metacognitive development, scientific publishing, teacher competence, and educational design. The contributions share one central proposition: the value of AI cannot be judged by technological capability alone. It must also be assessed in terms of human agency, epistemic responsibility, pedagogical purpose, institutional readiness, and social equity. This proposition gives the issue a common framework, while each paper keeps its own theoretical perspective, method, and empirical context.

Such a framework is needed because research on AI in education and in knowledge-intensive professions is expanding quickly. In their systematic review, Wang et al. (2024) map a broad research field that includes adaptive learning, intelligent assessment, learner profiling, and predictive systems. However, growth in technical capability must be matched by attention to educational effectiveness, theoretical foundations, and social consequences. UNESCO's *Guidance for Generative AI in Education and Research* identifies human agency, inclusion, equity, cultural and linguistic diversity, data protection, and institutional responsibility as key conditions for adopting GenAI (Miao & Holmes, 2023). The *Recommendation on the Ethics of Artificial Intelligence* sets out human dignity, human rights, transparency, fairness, and inclusion as core principles for responsible AI (UNESCO, 2021). These frameworks serve as a reference point for reading the six contributions in this issue.

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2. AI and the changing conditions of humanistic knowledge

In the first contribution, Zahra Sadat Roozafzai lays the philosophical and epistemological foundation of the issue. The paper examines how AI changes the conditions of humanistic interpretation. Using a conceptual phenomenological approach based on van Manen's (2014) phenomenology of practice and on critical studies of algorithmic mediation, the author treats AI not simply as a tool for processing information but as a technological intermediary that changes how scholars encounter evidence, build meaning, and exercise interpretive judgment.

The paper analyzes AI-mediated inquiry along four dimensions: epistemology, ontology, ethics, and temporality. It introduces four concepts: temporal dissonance, the algorithmic unconscious, technological reflexivity, and relational ambiguity. These concepts describe tensions between machine-speed inference and reflective interpretation, between computational outputs and opaque data histories, and between human agency and algorithmically mediated decisions. They also help scholars ask how automated analysis may reduce the time available for reflection, hide the assumptions built into data, and blur responsibility in human–AI collaboration.

The paper does not reduce the relationship between AI and the humanities to a simple conflict between technological progress and humanistic tradition. Instead, it calls for a reflexive approach: AI can support discovery, but contextual interpretation, source criticism, ethical deliberation, and scholarly accountability remain human tasks. This view is especially relevant to digital and applied humanities, where computational methods increasingly intersect with historical interpretation, cultural analysis, communication, and applied humanistic work. The paper thus raises a question that runs through the whole issue: how can scholars benefit from computational assistance without giving up the critical judgment that gives knowledge its meaning and credibility?

3. Generative AI, student engagement, and the conditions of learning

The second contribution, by Iffat Naomee and Md. Sourav Hasan, moves from the philosophical conditions of knowledge to students' actual experiences with GenAI in higher education. The authors conducted a mixed-methods case study at the Institute of Education and Research, University of Dhaka, combining a survey of 166 students with

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focus group discussions involving 18 participants. The study examines how the practical usefulness of GenAI relates to students' concerns about its effects on learning.

The authors describe students' attitudes as informed ambivalence. Students use GenAI for complex academic tasks, yet they worry that heavy reliance may weaken their critical thinking, creativity, and independent problem-solving. This tension between short-term productivity and long-term intellectual development is one of the main educational challenges posed by GenAI. The authors propose a productivity–skill trade-off and extend the Technology Acceptance Model by adding students' concerns. Together, these ideas help explain why using a tool does not mean fully accepting it.

The findings are relevant beyond the institution studied. They show that AI adoption should be examined as a pedagogical and sociotechnical process, not only as a matter of user acceptance. Students' experiences depend on the perceived usefulness of AI tools, but also on institutional policies, infrastructure, academic expectations, and shared views of what counts as legitimate learning. These results support UNESCO's call for clear, context-sensitive approaches to GenAI that protect learner agency and support meaningful learning (Miao & Holmes, 2023).

The contribution is particularly valuable because it foregrounds a context from the Global South, where the opportunities associated with emerging technologies must be considered alongside differences in infrastructure, institutional preparedness, and access to educational support. It therefore warns against assuming that AI adoption and its effects will be the same across countries and institutions. More broadly, it invites educators to rethink assessment design, academic integrity, and the balance between efficiency and the development of lasting intellectual skills.

4. Making metacognition visible: AI, self-regulation, and competence

The third contribution, by Alex Bluma, addresses a related but distinct question: can AI-supported learning environments help learners develop and demonstrate the metacognitive skills needed for autonomous learning? The paper presents Aegis-Strategos, a GenAI-powered strategic simulation designed to activate metacognitive regulation through a structured comparison mechanism over six sequential turns. In an exploratory mixed-methods study with 15 master's students, the system produced 90 scored interaction traces.

The study defines metacognition as the capacity to monitor, evaluate, and adjust one's own thinking. Building on research on metacognition and self-regulated learning

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(Flavell, 1979; Zimmerman, 2002), it argues that AI-supported interaction can make learners' reasoning, conceptual difficulties, and correction strategies more visible. Its three-layer model links cognitive development, feedback mechanisms, and the recognition of competence in professional settings. The paper further explores whether traces of learning and improvement could serve as competence signals for employers.

This contribution shifts the focus from the quality or speed of AI-generated answers to the learner's own thinking. It asks whether AI can help learners understand how they think, detect weaknesses in their reasoning, use feedback constructively, and make better independent decisions. The difference between producing an answer and being able to evaluate it is central to the responsible use of AI in education.

However, the implications of making learning traces visible require careful attention. Interaction records should not be treated as complete or validated measures of competence, and a small exploratory study cannot establish generalizable effects. Questions of assessment validity, contextual interpretation, privacy, and the comparability of indicators remain open. The proposed link between metacognitive evidence and employability is therefore best seen as a promising direction for future research, not as an established labor-market mechanism.

Read together with the second paper, this study clarifies an important distinction: using AI to complete learning tasks is not the same as using AI to build the capacities that make learning meaningful. It thereby contributes to a broader educational agenda in which technological assistance is evaluated according to its capacity to strengthen, rather than bypass, learners' intellectual autonomy.

5. AI-generated knowledge, scientific integrity, and the credibility of scholarship

The fourth contribution, by Jaime A. Teixeira da Silva, moves from educational practice to the integrity of academic publishing. The paper considers whether GenAI-generated content may intensify the perceived or actual junkification of science, that is, the accumulation of publications that add little to scholarly understanding while increasing the workload of readers, reviewers, editors, and research institutions.

The paper's main concern is not only that AI can produce inaccurate or superficial content. It is that the production and circulation of such content depend on institutional systems of selection, evaluation, and accountability. Peer review, editorial judgment, research assessment, and publication ethics are therefore central to understanding the

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risks. The paper also discusses the commercial value of AI-generated information, the role of retractions in correcting the scholarly record, and the effects of punitive or inconsistent responses to misconduct and publication errors.

These concerns are pressing because the volume of generated text may grow faster than the capacity of institutions to check its originality, evidence, and contribution to knowledge. Junkification is not, however, inevitable. Its extent depends on how GenAI is used and on whether editorial and institutional safeguards can still distinguish substantive scholarship from content that merely resembles it.

The Committee on Publication Ethics offers a clear reference point: AI tools cannot be authors because they cannot take responsibility for published work, and human authors remain accountable for what they submit (COPE, 2023). This principle calls for transparent disclosure of AI use, careful verification of references and claims, and clear editorial policies on AI-assisted writing, analysis, and content production. It also shows that research integrity cannot be left to automated detection tools alone.

By treating junkification as both a technological and an institutional problem, this contribution complements the first paper's focus on epistemic authority. Both papers ask the same basic question: what makes knowledge credible when plausible information can be produced automatically? Their combined implications extend to the governance of scholarly communication, the preservation of public trust in research, and the continuing importance of human judgment in evaluating evidence and intellectual contribution.

6. Teacher competencies, institutional readiness, and educational equity

The fifth contribution, by Hounkpodoté Hilaire, examines AI readiness in African education through teachers' professional competencies. Using PASEC2019 teacher assessment data from 14 Francophone African education systems (19,141 teachers), the study analyzes the distribution of teachers' content and pedagogical knowledge and its relationship with professional qualifications, in-service training, and contextual conditions.

A key methodological choice is to approach AI readiness through the professional capacities that underpin effective teaching, since the dataset does not measure AI adoption directly. The proposed Teacher AI-Readiness Index therefore assesses the foundational conditions for readiness; it does not measure teachers' actual AI use or AI

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competence. This distinction matters because it prevents general competency data from being read as direct evidence of AI preparedness.

The results reveal large differences in teacher competencies across countries. Professional teaching qualifications and in-service training are associated with higher competence scores. The study also identifies classroom electricity as an enabling condition, which shows that technology integration still depends on basic infrastructure. These findings challenge the assumption that AI can compensate for weak teacher preparation or limited resources. Effective integration depends instead on the professional knowledge, pedagogical judgment, and material conditions that allow teachers to decide when and how AI can support their teaching.

This perspective aligns with UNESCO's *AI Competency Framework for Teachers*, which defines five dimensions of professional development: a human-centred mindset, ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning (Miao & Cukurova, 2024). According to this framework, teachers need more than technical familiarity with AI systems. They must be able to make informed pedagogical decisions, protect learners, evaluate AI outputs, and maintain their professional agency.

The African evidence presented in this issue adds an essential dimension to international discussions of AI in education. It demonstrates why readiness must be considered in relation to unequal educational resources, professional development opportunities, and national contexts. Rather than treating these differences as obstacles that technology will automatically overcome, the study identifies teacher qualification and continuing professional development as important priorities for educational policy. Its broader implication is that equitable AI adoption requires investment in the people and institutions responsible for translating technological capabilities into educational value.

7. From automation to educational value: Human–AI co-learning

The sixth contribution, by Rohit Gupta and Rahul Gupta, brings the educational discussion together through a conceptual framework designed to distinguish AI capability from educational value. The authors argue that the availability of personalized learning, intelligent tutoring, automated feedback, and instructional assistance does not in itself establish that learning has improved. The central question is instead what

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pedagogical, human, and institutional conditions enable AI capabilities to contribute to meaningful educational outcomes.

The proposed Human–AI Co-Learning Framework (HACLF) has six interconnected layers: the learner, the AI assistant, the teacher, the learning environment, governance, and society. The accompanying AI Education Value Index (AEVI) evaluates AI use along five dimensions: personalization, reliability, human agency, equity, and learning authenticity. Together, these tools shift the focus from what AI can do to the conditions under which its use supports genuine learning.

This distinction is important as automation spreads in education. Personalized explanations and rapid feedback can support learning, but only if they are accurate, pedagogically appropriate, and used by learners who can evaluate them. Automated assistance may reduce routine workload, but it can also harm learning if it replaces the productive effort through which understanding develops. For this reason, the framework places teachers, learners, governance, and social conditions in a single analytical model, rather than treating AI as a stand-alone solution.

The paper complements the studies on student engagement and metacognition by offering a multidimensional basis for evaluating AI integration. It also echoes Wang et al. (2024), who document the diversity of AI applications in education and the need for more systematic evaluation of their effects. The HACLF and the AEVI are proposed frameworks; they still need to be operationalized, tested, and validated in different educational contexts. Their value lies in providing a structured starting point for research on the links between technological capability, pedagogical design, and learning outcomes.

8. An integrated perspective: Human agency, responsibility, and the public value of AI

Taken together, the six contributions point to four connected dimensions of AI-driven change. The first is epistemological: how AI affects interpretation, evidence, scholarly judgment, and the credibility of information. The second concerns learning and intellectual development: whether AI supports student engagement, metacognitive awareness, independent reasoning, and lasting competencies. The third concerns institutional and professional responsibility: how editors, teachers, researchers, and educational leaders set standards for appropriate and accountable use. The fourth concerns equity and context: how infrastructure, professional preparation, cultural diversity, and unequal access shape the distribution of AI's benefits and risks.

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These dimensions reinforce one another. The credibility of AI-assisted knowledge depends partly on the competence of those who produce and evaluate it. The educational value of AI depends on teachers' professional judgment and on students' active participation. A fair distribution of its benefits requires institutional investment, infrastructure, accessible professional development, and governance that takes context into account. Ethical principles, in turn, become effective only when they are translated into concrete practices of disclosure, verification, assessment, accountability, and informed decision-making.

The contributions also call for a more precise view of human–AI collaboration. Protecting human agency does not mean excluding AI from intellectual work, and AI capability does not make human judgment unnecessary. The more useful question is how tasks, responsibilities, and decision-making authority should be shared. AI can assist with information retrieval, pattern recognition, feedback, drafting, and the exploration of alternative interpretations. However, responsibility for evaluating evidence, interpreting context, setting educational goals, validating scholarly claims, and dealing with the consequences of decisions remains with people and institutions.

This position is consistent with the human-rights-based approach of UNESCO's *Recommendation on the Ethics of Artificial Intelligence*, which stresses transparency, fairness, human oversight, inclusion, and respect for human dignity (UNESCO, 2021). It also implies that AI governance is an ongoing institutional responsibility, not a one-time technical intervention. Responsible adoption requires continuous evaluation as systems, practices, and educational needs change.

The issue also cautions against assuming that the benefits and risks of AI are shared equally. The study of students in Bangladesh and the analysis of teacher competencies in Francophone Africa draw attention to contexts that are often underrepresented in mainstream debates on AI. They show how AI adoption is linked to infrastructure, institutional capacity, professional development, and local priorities. These studies support a more globally attentive approach to AI research, one that recognizes differences in resources and experience without reducing diverse contexts to a single model of technological readiness.

The special issue also suggests a research agenda that goes beyond general claims about the transformative potential of AI. Future studies should examine the long-term effects of AI use on critical thinking, metacognition, creativity, and independent

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problem-solving. They should also validate the proposed measures of teacher and institutional readiness, test the reliability and fairness of AI-supported assessment, and evaluate how AI-generated content affects scholarly quality, editorial workload, and public trust. Comparative research across education systems, languages, and cultures is needed to determine which practices work, for whom, and under what conditions.

For digital and applied humanities, these questions open a space for interdisciplinary collaboration. Philosophical inquiry can clarify what algorithmic mediation means for knowledge and interpretation. Educational research can examine how AI assistance relates to intellectual development. Empirical studies can identify the contextual conditions that shape adoption. Publication ethics can help protect the credibility of scholarly communication. Such collaboration is needed if AI is to be understood not only as a set of technical capabilities but as a set of practices embedded in human relationships, institutions, and social values.

9. Concluding remarks

The six papers in *AI in Digital and Applied Humanities* offer complementary perspectives on a fast-changing field. Together, they move the debate beyond a simple opposition between technological optimism and technological resistance. They show that the significance of AI lies neither only in its capacity to automate tasks nor only in the risks it creates, but in the relationships between technological capability, human judgment, educational purpose, professional responsibility, and social conditions.

The issue therefore supports a human-centred and critical approach to AI. This approach recognizes the potential of AI to support discovery, learning, reflection, and collaboration, while stressing the need for verification, ethical safeguards, institutional accountability, and equitable access. In short, technological innovation must go hand in hand with intellectual and professional development; efficiency is not learning; generated information is not validated knowledge; and access to AI is not the same as readiness to use it well.

We hope this special issue will encourage further interdisciplinary dialogue among scholars, educators, researchers, policymakers, and institutional leaders. By combining philosophical reflection, empirical evidence, conceptual frameworks, and critical analysis of scholarly practice, it aims to improve our understanding of the conditions under which AI can serve human and educational purposes. The challenge for digital and applied humanities is not only to explore what AI makes possible, but also to direct its

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capabilities towards credible knowledge, meaningful learning, accountable institutions, and more inclusive and equitable technological futures.

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