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Editorial: Knowledge in the Service of Human Possibility

This issue of Acta Eruditorum considers computation, artificial intelligence, and scientific discovery as a field of shared responsibility. The journal approaches scholarship as more than the accumulation of findings: it is a disciplined public practice through which claims are tested, inherited assumptions are revised, and human beings enlarge their capacity to act wisely.

The papers are interdisciplinary conceptual syntheses. They do not claim to report original human-subjects experiments. Their contribution is integrative: each connects empirical literature, institutional analysis, ethics, and practical governance while identifying questions that remain open.

Contents

Artificial Intelligence as an Instrument of Discovery

Acta Eruditorum Editorial Team

Abstract

This conceptual review examines scientific inference, simulation, automation, interpretability, and epistemic responsibility. It develops an integrated account of how evidence, institutions, values, and implementation interact, and it identifies practical conditions for responsible progress. The synthesis argues that technical capacity alone is insufficient: durable gains require legitimacy, equitable participation, transparent evaluation, and mechanisms for learning and correction. The paper concludes with implications for research, governance, and professional practice.

Keywords: systems thinking, governance, evidence, equity, institutional learning, human progress

Research Questions

1. How should scientific inference, simulation, automation, interpretability, and epistemic responsibility be conceptualized as a system?
2. Which institutional conditions support trustworthy and equitable outcomes?
3. What research and governance practices improve learning over time?

Introduction

The central problem is not a shortage of ingenuity but a failure to connect knowledge, institutions, and lived consequences. scientific inference, simulation, automation, interpretability, and epistemic responsibility must therefore be understood as a relational system rather than a collection of isolated techniques. This perspective rejects the convenient separation of technical performance from social consequence. A system may be efficient while remaining brittle, exclusionary, or incapable of learning from error.

For scientific inference, simulation, automation, interpretability, and epistemic responsibility, the decisive question is who can act, who bears risk, whose knowledge counts, and what mechanisms permit revision. Those questions connect scientific quality to public legitimacy and practical durability. (National Academies of Sciences, Engineering, and Medicine, 2017).

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Conceptual Foundations

A systems perspective changes the unit of analysis. It asks how incentives, professional norms, material infrastructures, cultural expectations, and unequal power jointly shape outcomes in scientific inference, simulation, automation, interpretability, and epistemic responsibility. This perspective rejects the convenient separation of technical performance from social consequence. A system may be efficient while remaining brittle, exclusionary, or incapable of learning from error.

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Analysis

The literature indicates that durable progress depends on capability, legitimacy, and learning operating together. Capability enables action; legitimacy sustains cooperation; and learning permits correction when assumptions fail. This perspective rejects the convenient separation of technical performance from social consequence. A system may be efficient while remaining brittle, exclusionary, or incapable of learning from error.

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Human-AI Collaboration in the Laboratory and the Field

Acta Eruditorum Editorial Team

Abstract

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Data Infrastructure for Reproducible Computational Science

Acta Eruditorum Editorial Team

Abstract

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Keywords: systems thinking, governance, evidence, equity, institutional learning, human progress

Research Questions

7. How should provenance, standards, code, repositories, and long-term stewardship be conceptualized as a system?
8. Which institutional conditions support trustworthy and equitable outcomes?
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Introduction

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Governing Foundation Models in Research

Acta Eruditorum Editorial Team

Abstract

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Keywords: systems thinking, governance, evidence, equity, institutional learning, human progress

Research Questions

10. How should access, concentration, evaluation, safety, and the norms of scientific openness be conceptualized as a system?
11. Which institutional conditions support trustworthy and equitable outcomes?
12. What research and governance practices improve learning over time?

Introduction

The central problem is not a shortage of ingenuity but a failure to connect knowledge, institutions, and lived consequences. access, concentration, evaluation, safety, and the norms of scientific openness must therefore be understood as a relational system rather than a collection of isolated techniques. This perspective rejects the convenient separation of technical performance from social consequence. A system may be efficient while remaining brittle, exclusionary, or incapable of learning from error.

For access, concentration, evaluation, safety, and the norms of scientific openness, the decisive question is who can act, who bears risk, whose knowledge counts, and what mechanisms permit revision. Those questions connect scientific quality to public legitimacy and practical durability. (National Academies of Sciences, Engineering, and Medicine, 2017).

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A useful framework therefore distinguishes inputs, capabilities, decisions, outcomes, and feedback. It also recognizes time: near-term gains can create long-term liabilities, while investments in trust, maintenance, and learning may appear costly before their benefits become visible. (Sen, 1999).

Analysis

The literature indicates that durable progress depends on capability, legitimacy, and learning operating together. Capability enables action; legitimacy sustains cooperation; and learning permits correction when assumptions fail. This perspective rejects the convenient separation of technical performance from social consequence. A system may be efficient while remaining brittle, exclusionary, or incapable of learning from error.

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Equity is analytically central rather than an optional moral appendix. Unequal exposure, access, voice, and remedy alter both the distribution of outcomes and the reliability of the system itself. Excluded groups often hold information that formal monitoring fails to capture.

Institutional Implications

Institutions should build feedback into ordinary operations, publish decision rationales, protect dissent, and measure distributional effects. These practices turn abstract commitments into routines that can be inspected and improved. This perspective rejects the convenient separation of technical performance from social consequence. A system may be efficient while remaining brittle, exclusionary, or incapable of learning from error.

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Limitations and Future Research

This synthesis does not establish causal effect sizes and cannot erase differences among national, disciplinary, or community contexts. Comparative longitudinal research should test the proposed relationships and identify boundary conditions. This perspective rejects the convenient separation of technical performance from social consequence. A system may be efficient while remaining brittle, exclusionary, or incapable of learning from error.

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Conclusion

Progress in access, concentration, evaluation, safety, and the norms of scientific openness is neither automatic nor purely technical. It is produced when evidence is joined to ethical purpose, competent institutions, inclusive participation, and an ongoing capacity for self-correction. This perspective rejects the convenient separation of technical performance from social consequence. A system may be efficient while remaining brittle, exclusionary, or incapable of learning from error.

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Issue Synthesis: A Program for Inquiry and Action

Across the four papers, computation, artificial intelligence, and scientific discovery emerges as a problem of alignment. Knowledge must be credible, institutions capable, participation meaningful, and correction possible. None of these conditions substitutes for another.

Editorial Commitments

- Distinguish evidence from advocacy while acknowledging that values shape research questions.
- Report uncertainty, limitations, and distributional consequences.
- Protect open criticism, replication, and reasoned dissent.
- Design participation so affected communities can influence decisions before commitments become irreversible.
- Treat maintenance, stewardship, and learning as core elements of innovation.
- Evaluate progress through human capability and ecological durability, not output alone.

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