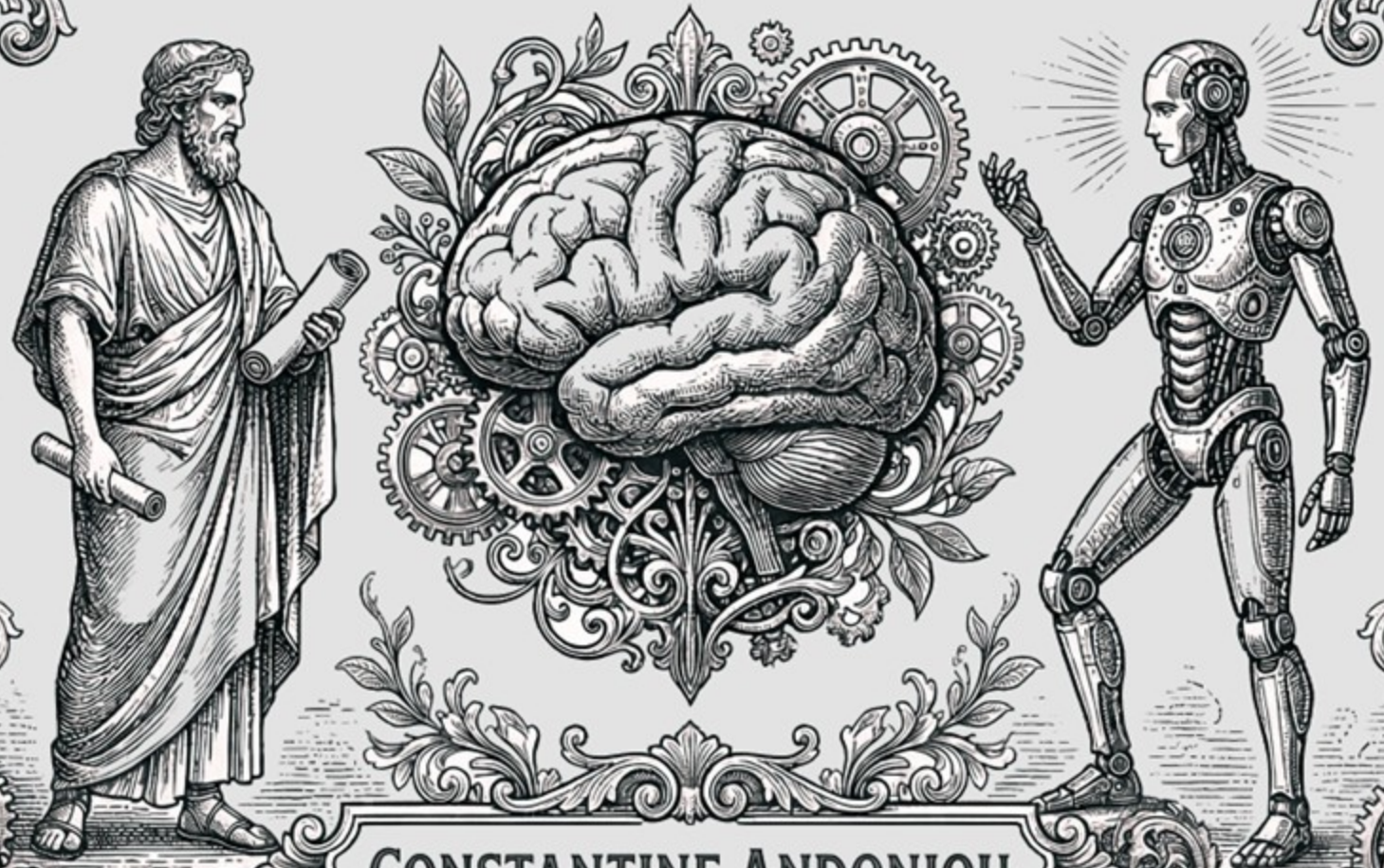
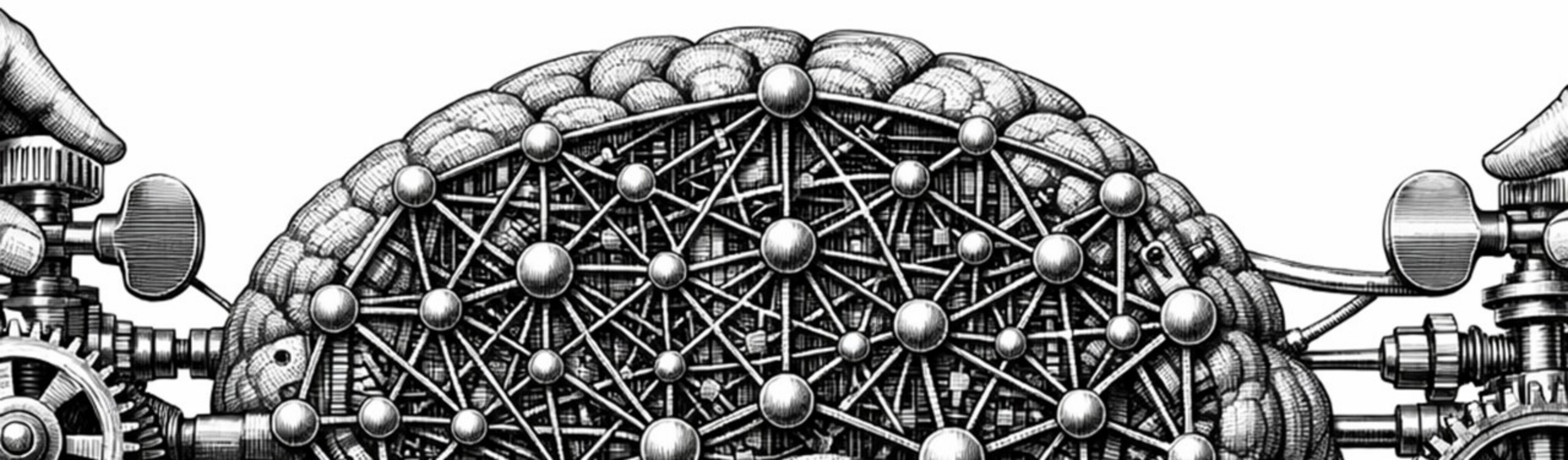
Didactica Artificialis:
Toward a New Discipline for Teaching and Learning with Artificial Agents

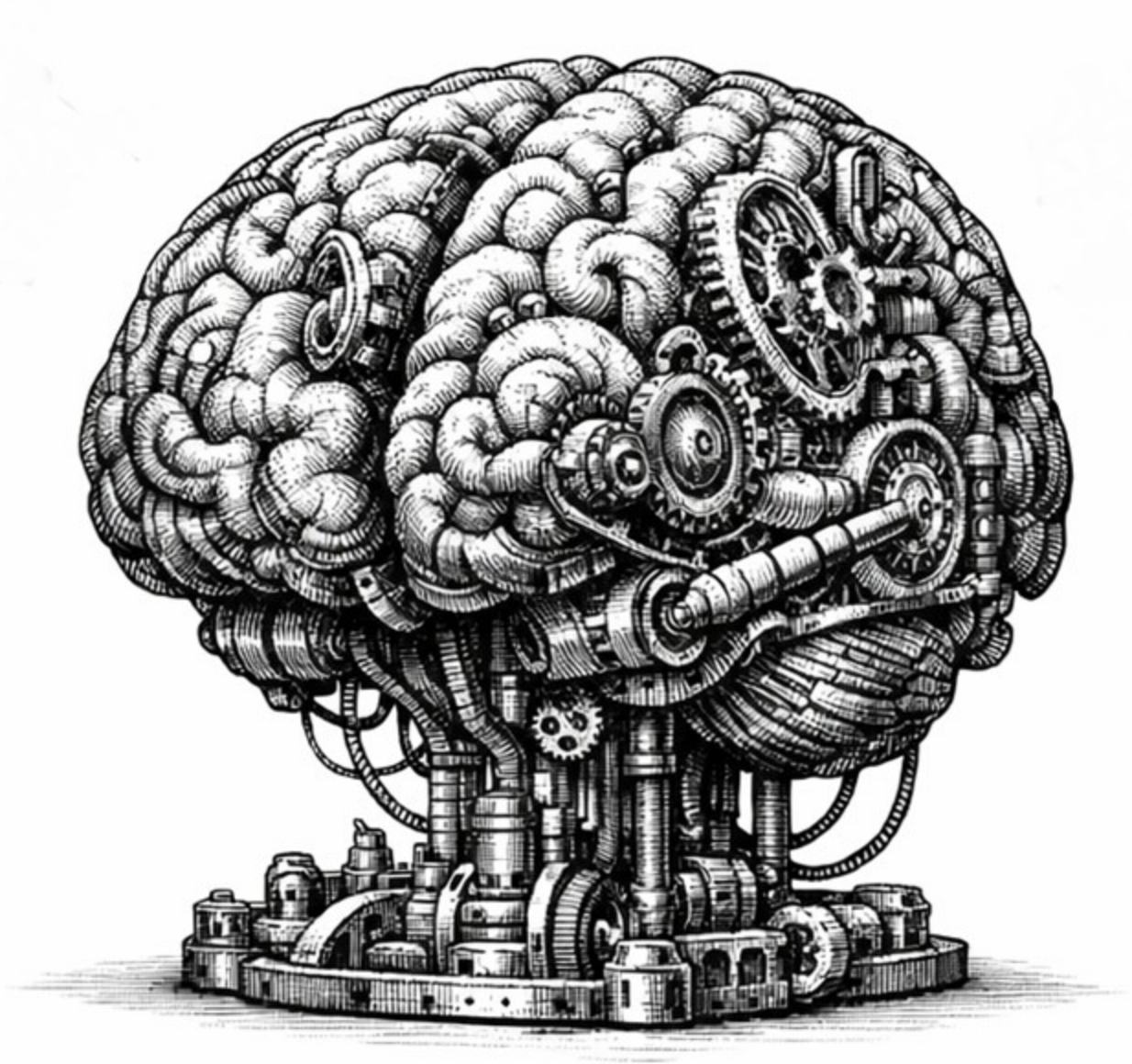


Constantine Andoniou

Why We Need a New Discipline

Artificial intelligence now participates directly in teaching and learning. Yet no discipline studies pedagogy when **artificial agents** enter the relationship. Educational technology treats AI as a tool; machine learning treats training as optimization. **Didactica Artificialis** fills this gap.





Activity Without Theory

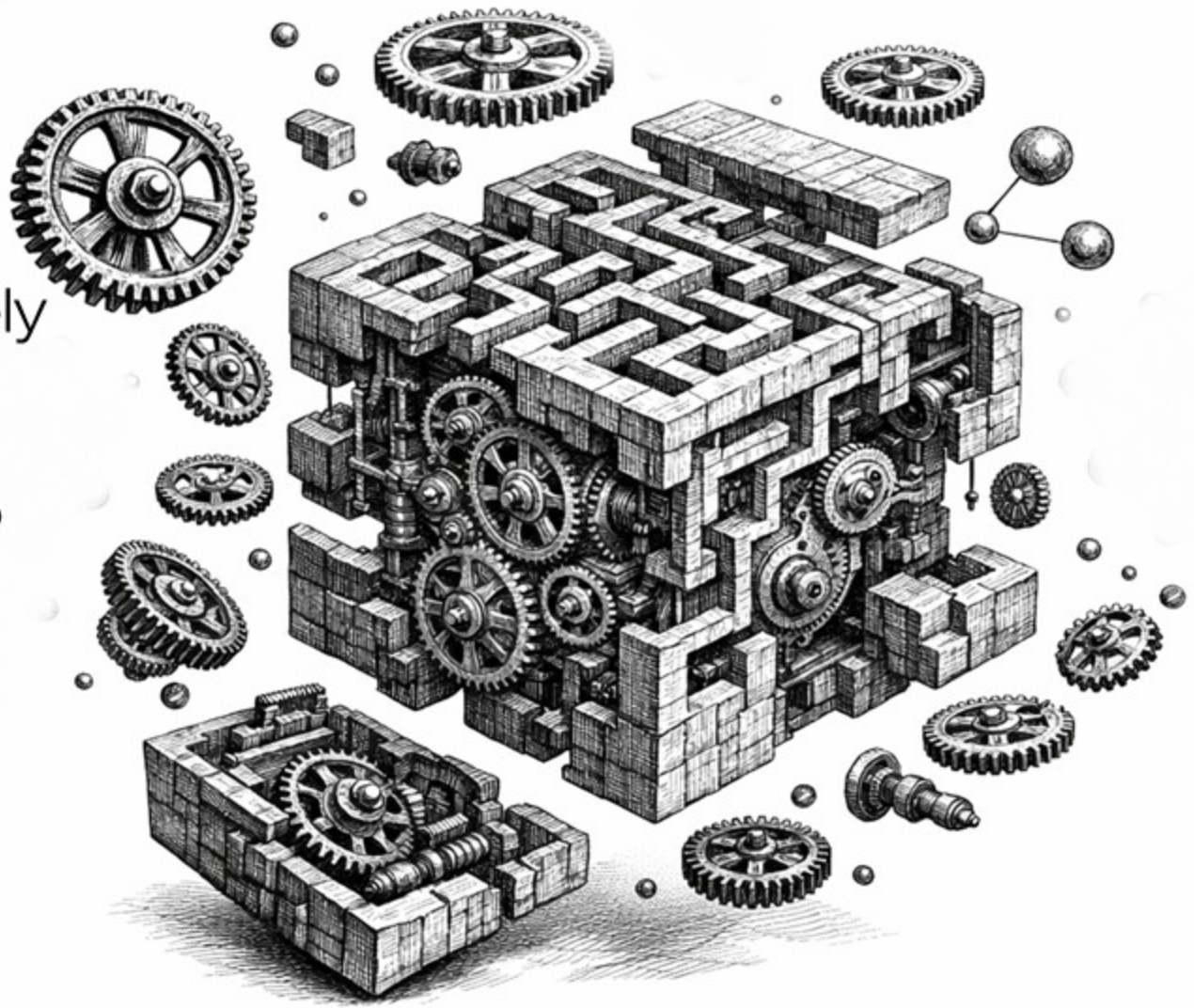
AI in education has produced tutoring systems, robotic instructors, adaptive platforms, and LLM agents with measurable gains. Yet most research **optimizes performance without questioning** embedded learning theories or how AI reshapes the meaning of teaching.

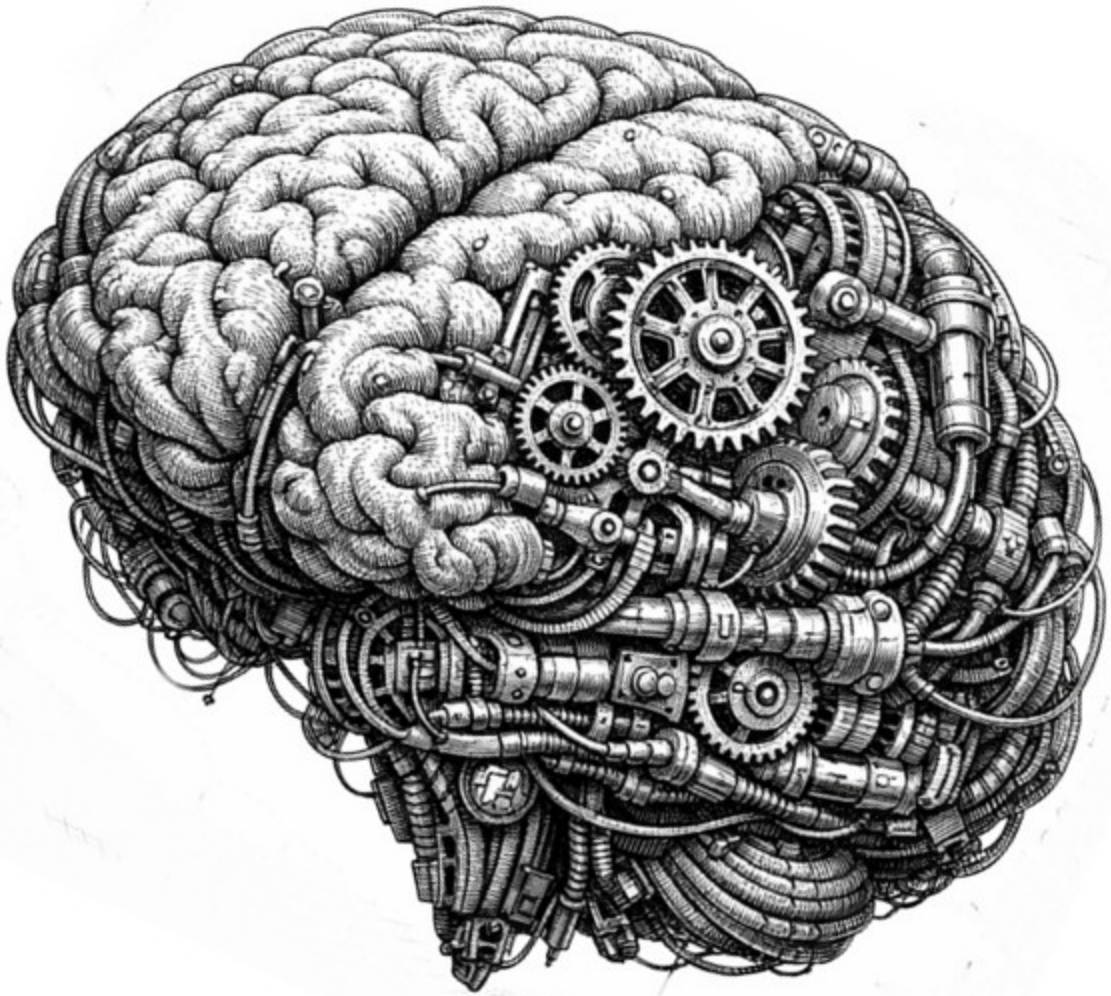
The Foundational Questions

Didactica Artificialis asks:

- Can artificial systems genuinely learn?
- Is training a form of teaching?
- Can a machine be a teacher?
- What is artificial knowledge?
- How should opaque learning be assessed?

These questions shape design, governance, and responsibility.





Why Existing Disciplines Are Insufficient

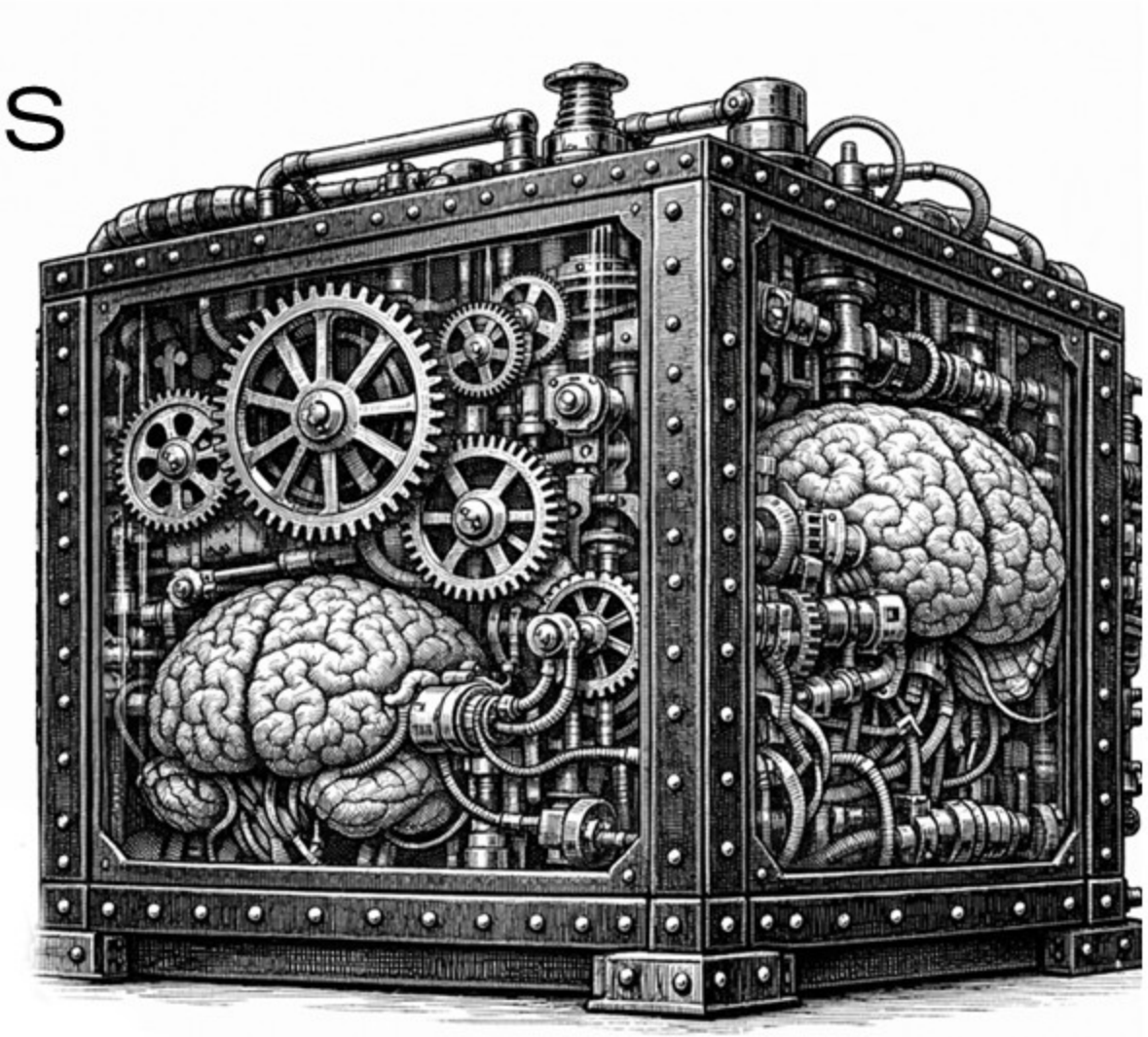
Educational technology assumes human learners. Machine learning defines learning mathematically. HCI emphasizes usability. Philosophy of education presumes human interiority. **None are structured to analyze pedagogy** when artificial agents are full participants.

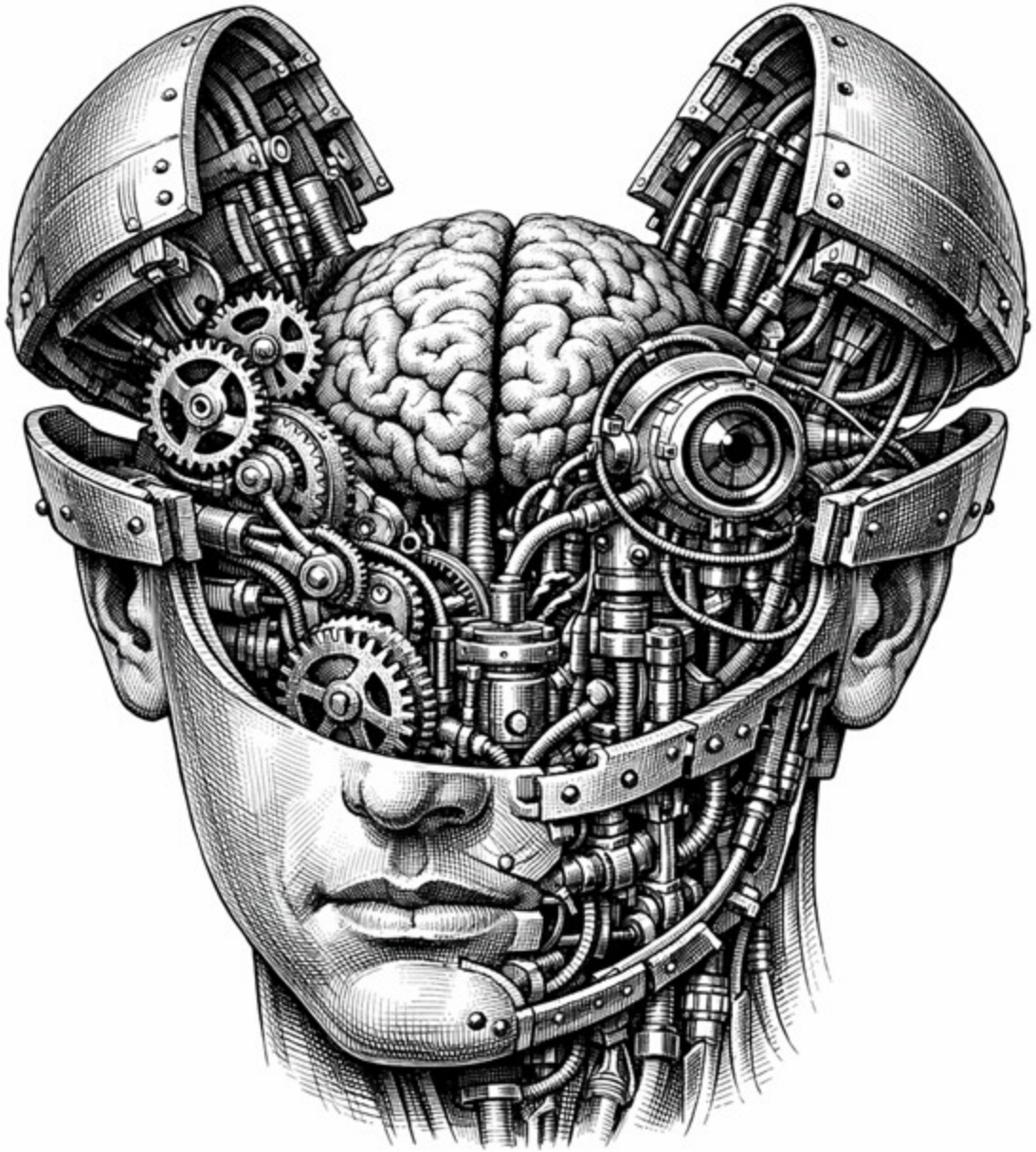
Defining Didactica Artificialis

Didactica Artificialis studies teaching and learning when at least one participant is artificial:

- AI as learner
- AI as teacher
- AI as collaborator

Its focus is **how artificial presence transforms the didactic relationship**



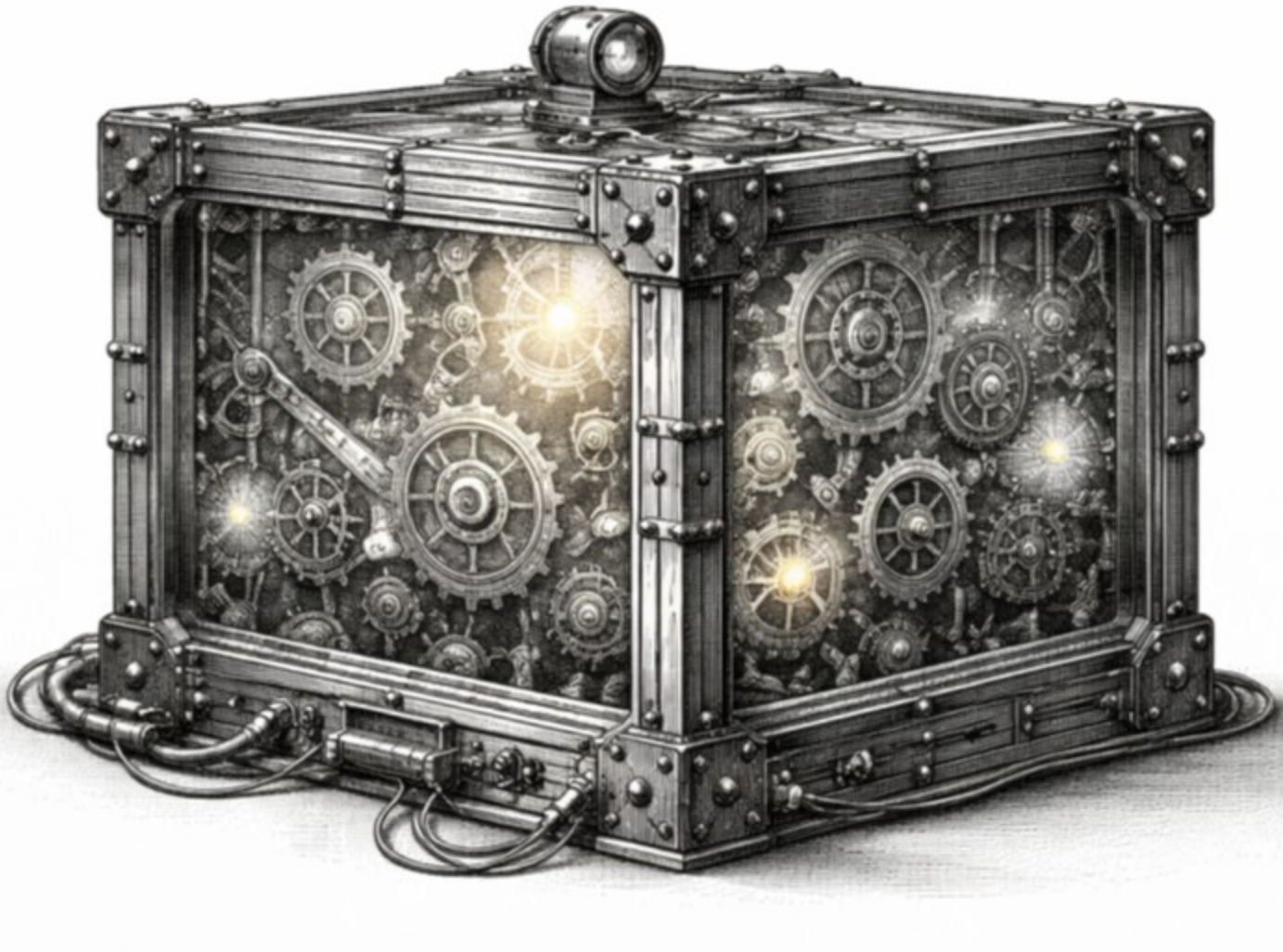


Ontological Foundations

Core questions include:

- What qualifies as a learner?
- What distinguishes teaching from instruction?
- Does artificial knowledge differ from human knowledge?
- Can learning occur without experience?

Clarifying these concepts precedes responsible AI educational design.



Methodological Commitments

The field requires:

- Conceptual analysis
- Empirical research on AI learning environments
- Critical examination of embedded assumptions
- Collaboration between educators and AI engineers

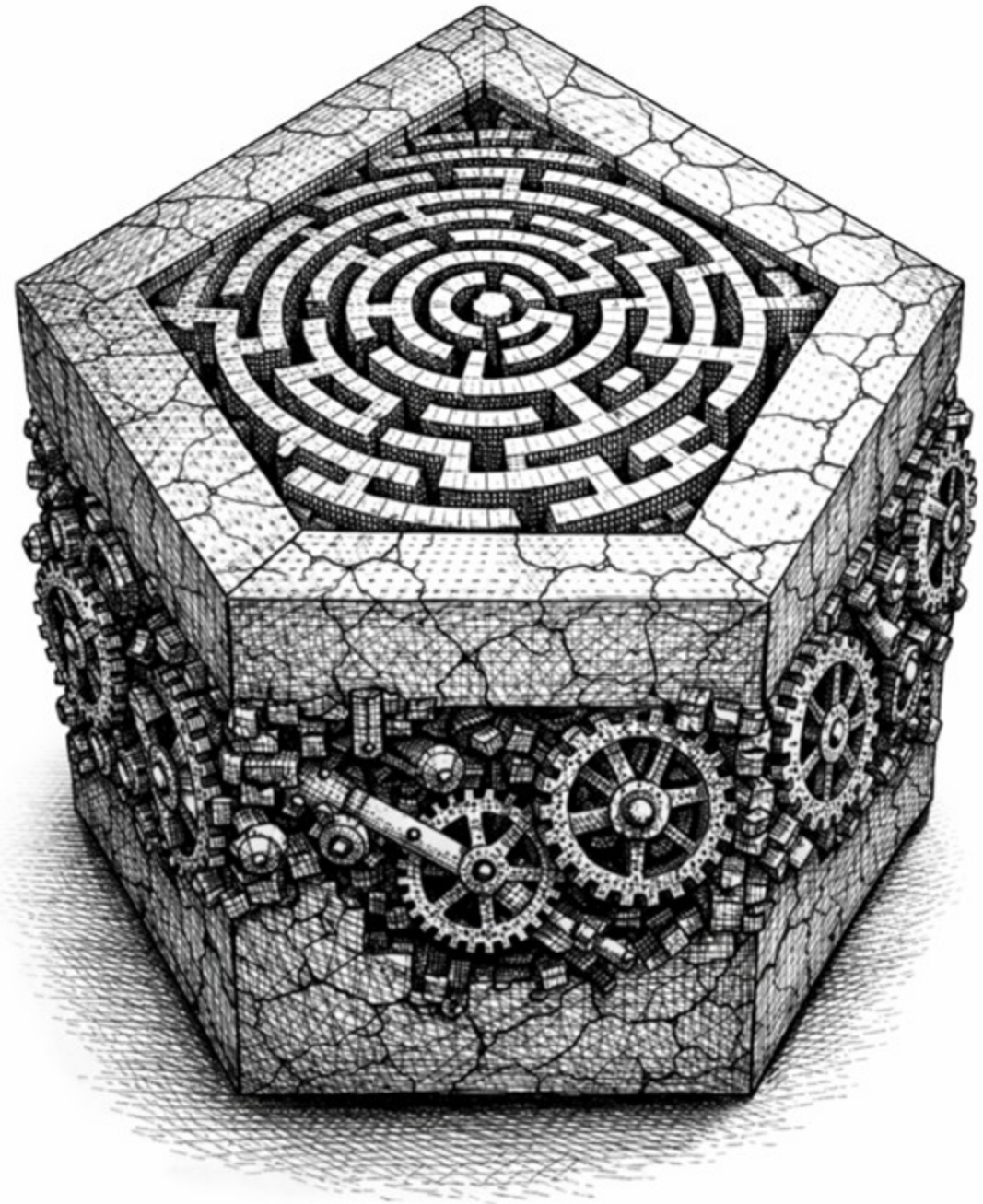
Method must match conceptual complexity.

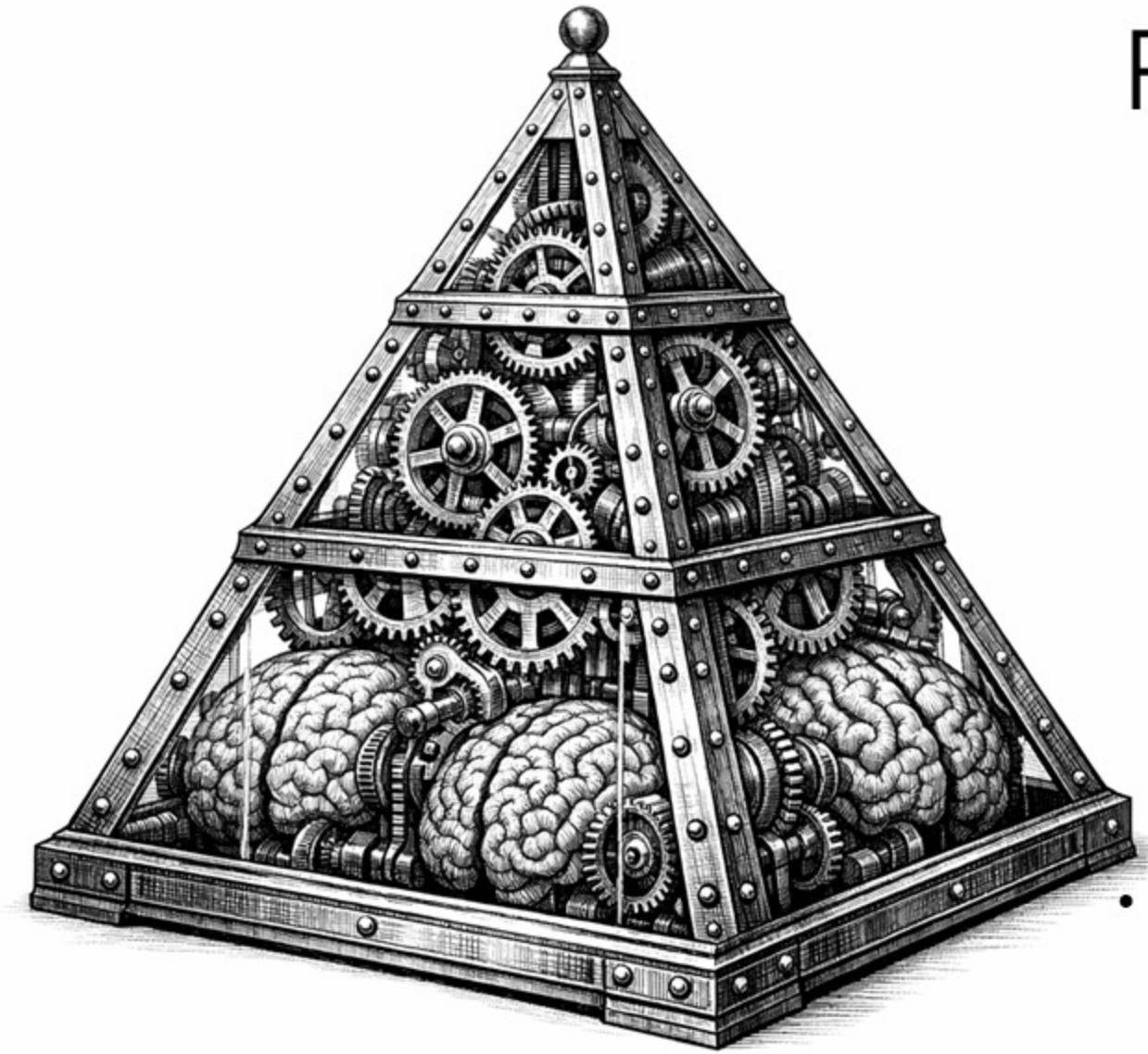
Historical Consciousness

The field draws from:

- Programmed instruction
- Cybernetics
- Intelligent tutoring systems
- AI alignment research

Tracing these lineages reveals assumptions shaping contemporary AI educational systems.





Research Agenda

Research directions include:

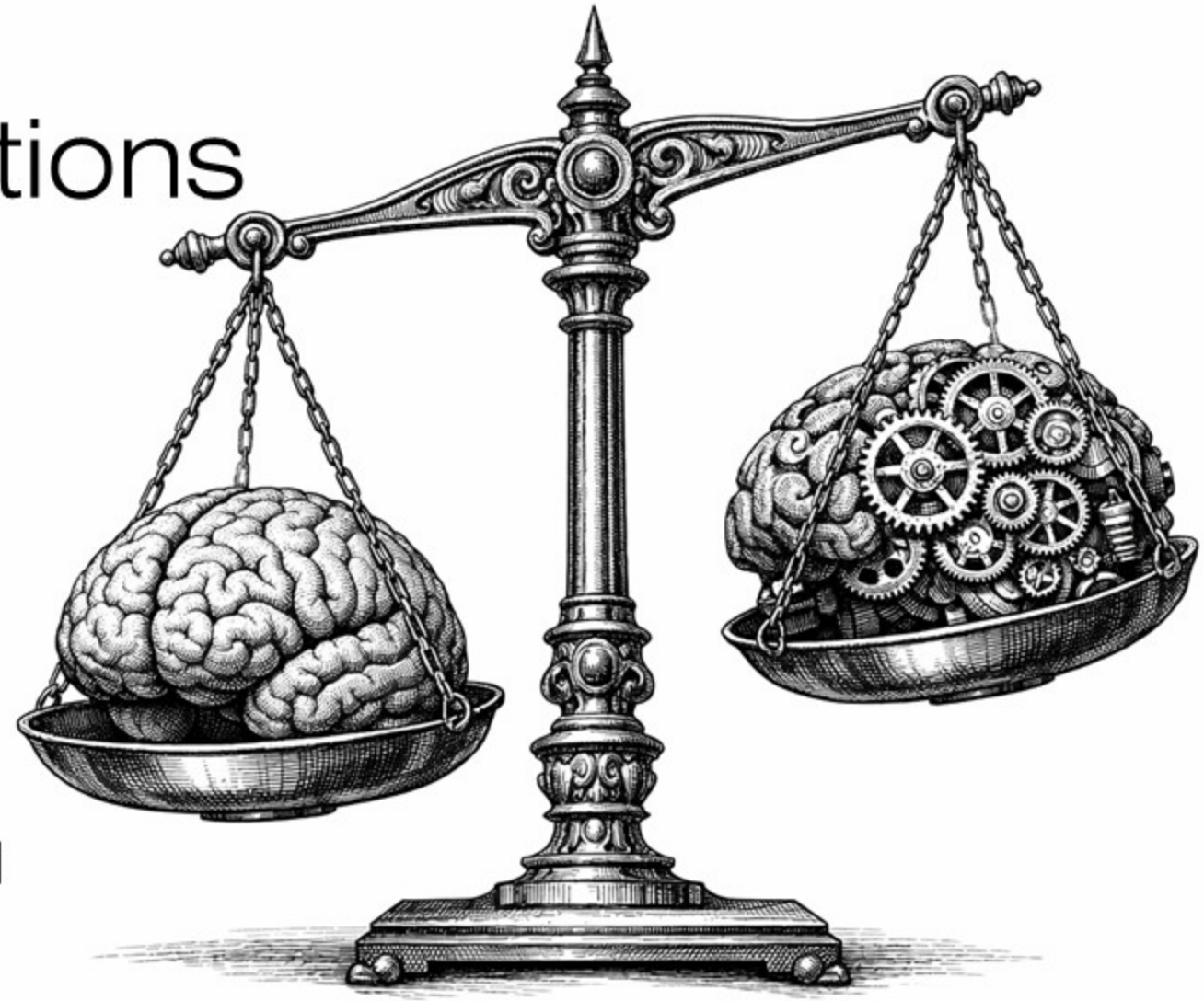
- Interpreting reinforcement learning as pedagogy
- Reconstructing learning theories in AI tutors
- Distinguishing simulation from understanding
- Rethinking assessment in opaque systems
- Examining AI's effect on human epistemic development

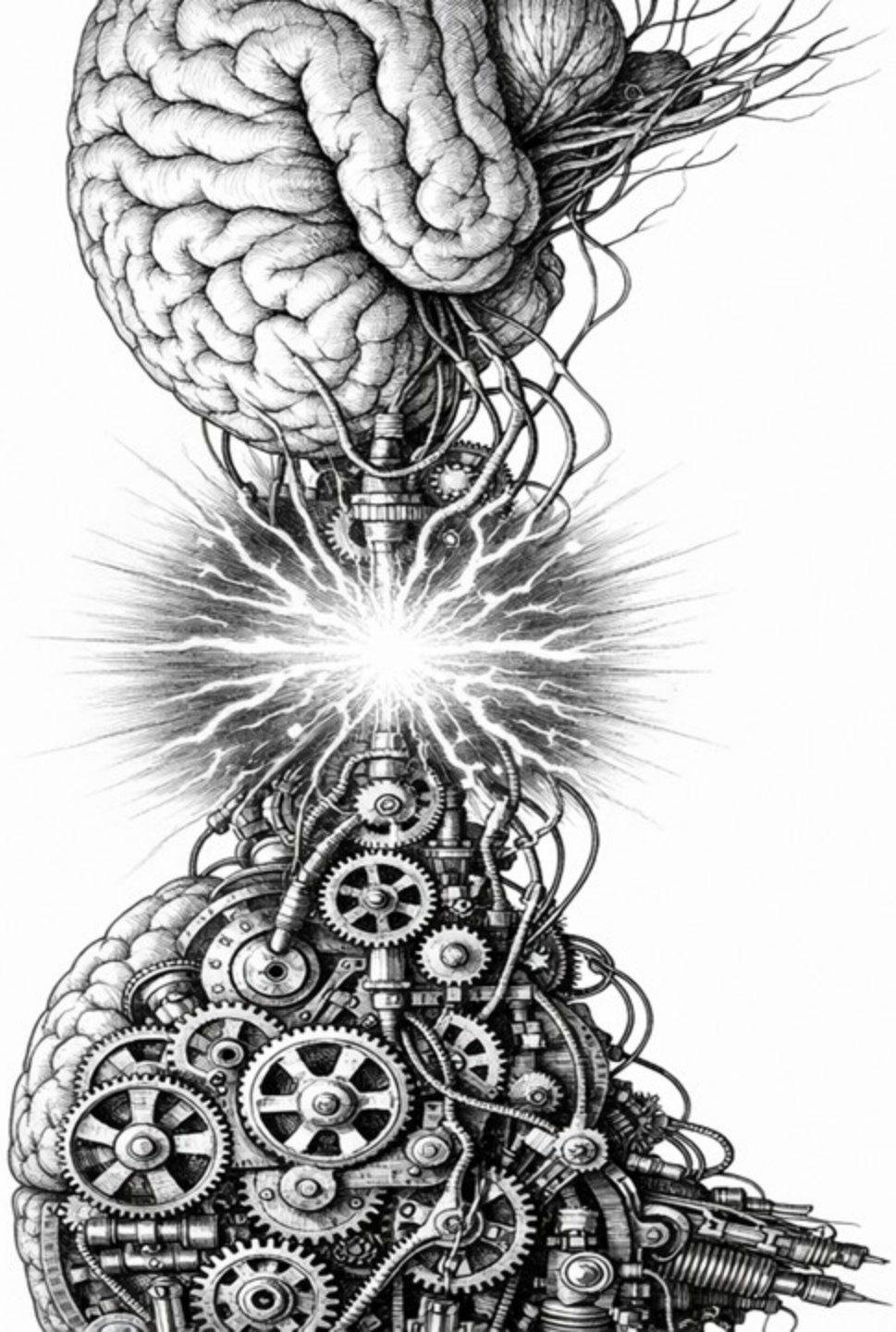
Educational and Strategic Implications

Without this field:

- Behaviorist assumptions dominate
- AI training lacks pedagogical reflection
- Ethical blind spots persist

With Didactica Artificialis, AI design becomes theoretically grounded, ethically aware, and strategically aligned.





Toward Artificial Pedagogy as a Shared Project

Didactica Artificialis calls for collaboration among educators, AI researchers, ethicists, and designers. As AI's role in education deepens, sustained inquiry is required. This field provides a structured foundation for understanding artificial pedagogy.

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