

THE AI PRISM

seeing *beyond* the tool

Linda Castañeda
University of Murcia



FOUR SEMINARS.

FOUR INSTRUMENTS
FOR SEEING
EDUCATION
DIFFERENTLY.

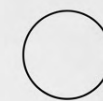
EDUCATIONAL OPTICS

FOUR INSTRUMENTS FOR SEEING
AND SHAPING LEARNING SPACES

SYDNEY · JULY–SEPTEMBER 2026



PRISM



LENS



MIRROR



TELESCOPE

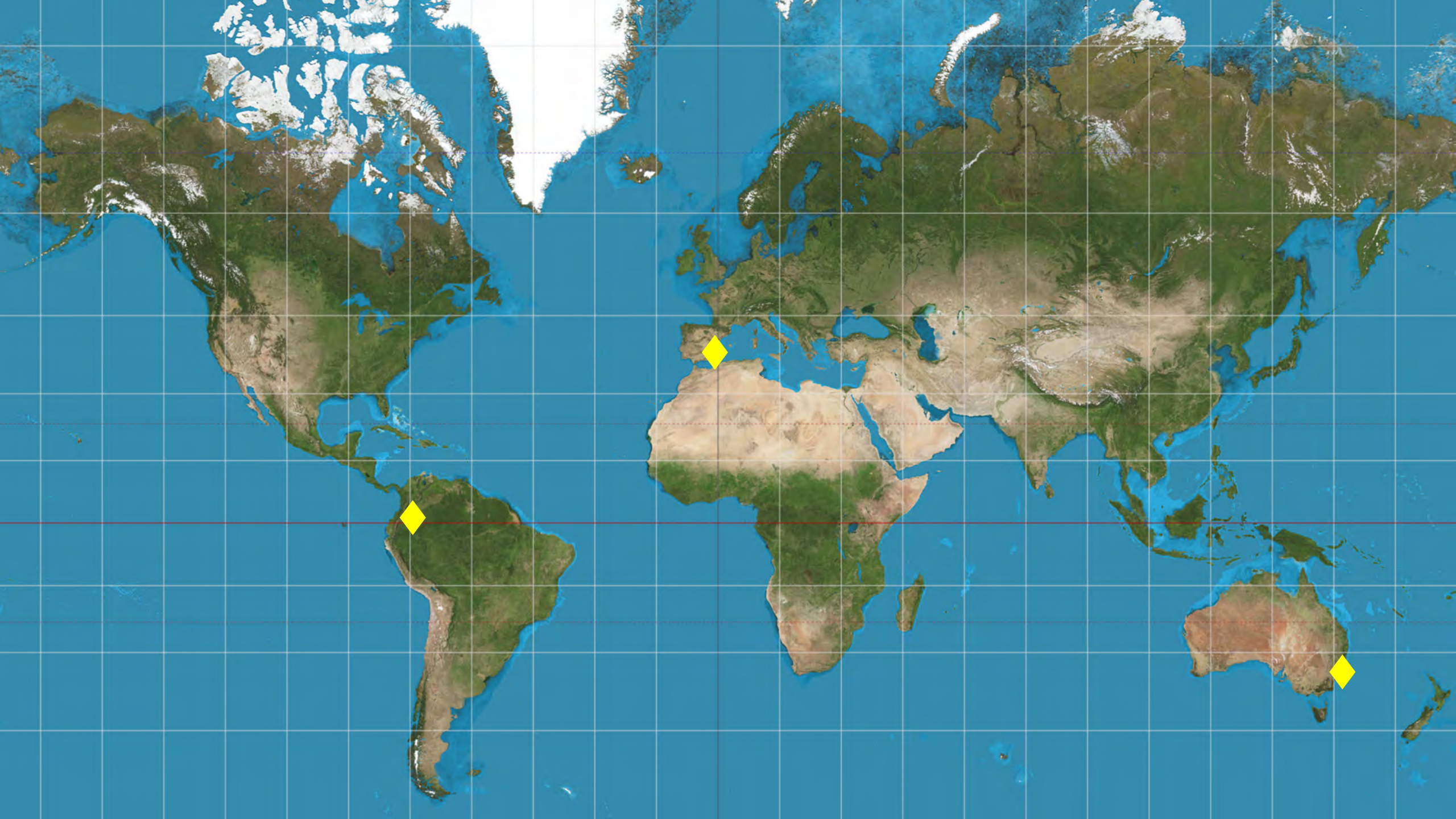
LINDA CASTAÑEDA



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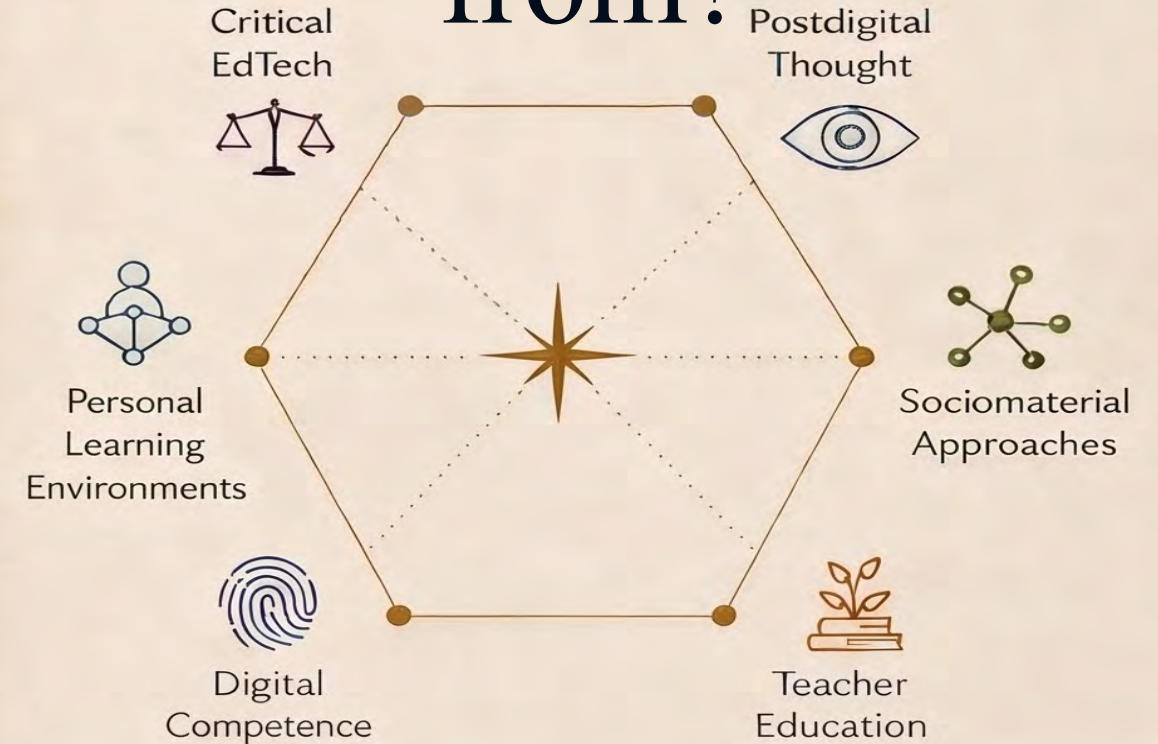








Where am I looking from?



Education before technology | Technology as non-neutral | Practice as sociomaterial
Agency as distributed — but responsibility as unavoidable
Teachers and learners as subjects, not users | Criticality without technological fatalism

I am interested in
critique that keeps
agency alive

THE AI PRISM

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UNDERSTANDING

expands the space of educational decision-making.



What exactly are we
debating when we
debate AI?

A large, white, sans-serif capital letter 'A' is centered in the upper half of the image. The background is a dramatic landscape featuring a range of mountains under a sky filled with orange and red clouds, suggesting a sunset or sunrise. The mountains in the foreground are dark and silhouetted, while the sky is a vibrant mix of orange, yellow, and red hues with some darker, smoky clouds.

A

has become one of the most discussed issues in education.

USE vs ***DON'T***



INSTRUMENTAL

ETHICAL

has never been
just *a tool*

IDEOLOGY
Veletsianos & Moe

POWER
Selwyn

POLITICS
Winner

INFRASTRUCTURE
Williamson

DESIGN
Feenberg

MEDIATION
Friesen

RELATIONS
Oliver

CONFIGURATION
Llorens

MARKETS
Adell

VALUES
de Vries

Technology



What if this debate
is not wrong...
...**but**
incomplete?



What becomes visible
depends on
how we look

A prism does not simplify
It refracts



AI IN EDUCATION



“a Botero style painting
of a young woman using
a laptop, digital art”



You

recomiéndame libros clásicos

Es buena la robótica en educación primaria?

Pricing

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SCISPACE

Insight from top 5 papers

La robótica ha demostrado tener efectos positivos en la educación primaria. Los metanálisis de varios estudios han demostrado que las intervenciones robóticas tienen un efecto agregado medio a favor del rendimiento cognitivo de los estudiantes de primaria [1]. Se ha descubierto que los robots sociales, en particular, son una herramienta prometedora para abordar los desafíos de la educación primaria, como la robótica y la programación en la enseñanza de las matemáticas mejorando las actitudes de los estudiantes [4]. Sin embargo, se necesita más investigación para desarrollar opciones de bajo costo para una mayor accesibilidad en la educación primaria, pero es necesario seguir investigando y desarrollando para entender el papel de los robots en el aula de primaria.

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Papers (10)

Journal Article • DOI

The Impact of Educational Robotics on Cognitive Primary Students: A Meta-Analysis of Recent Studies

Kalibek Ybyralmzhanoov +3 more

15 Oct 2023 • European journal of educational research

Ask Copilot

Open access • Dissertation • DOI

Robots in education

Aurélien Lignereux

03 May 2023

Ask Copilot

SCISPACE

Insight from top 5 papers

Se ha descubierto que el aprendizaje basado en proyectos tiene efectos positivos en los entornos de la escuela secundaria. Se ha demostrado que beneficia a los estudiantes al facilitarles el acceso a los materiales de aprendizaje, ayudarlos a desarrollar sus habilidades académicas y promover el uso de la tecnología [1]. Además, se ha descubierto que el aprendizaje basado en proyectos mejora las habilidades de pensamiento crítico, comunicación, creatividad y colaboración de los estudiantes [2]. También ha sido eficaz para mejorar las habilidades de lectura en inglés de los estudiantes, estimular su interés por la lectura y mejorar su experiencia general de aprendizaje del inglés [3]. Además, se ha descubierto que el aprendizaje basado en proyectos tiene un efecto muy positivo en las capacidades 4C de los estudiantes, que incluyen el pensamiento crítico, la comunicación, la creatividad y la colaboración [4]. Además, se ha identificado que el modelo de aprendizaje basado en proyectos es un enfoque adecuado para mejorar las habilidades de pensamiento creativo de los estudiantes en biología [5]. En general, la investigación sugiere que el aprendizaje basado en proyectos es beneficioso para los estudiantes de secundaria, ya que promueve sus habilidades académicas, su capacidad de pensamiento crítico y su participación general en el proceso de aprendizaje.

Was this helpful? Ask a follow up

Add columns (1)

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Papers (10)

Open access • Journal Article • DOI

Project-based learning during the pandemic: what are high school students' views?

Fitria Amanda +1 more

04 May 2023 • Majalah Ilmiah Warta Dharmaawangsa

PDF Ask Copilot

Open access • Journal Article • DOI

An Experimental Study of the Impact of Project-based Learning on Senior High Students' 4C Abilities

Su Ching Lin

04 May 2023 • Journal of Studies in Education

El documento confirma que el aprendizaje basado en proyectos (PjBL) es más eficaz que la pedagogía tradicional para mejorar las habilidades de pensamiento crítico, comunicación y colaboración de los estudiantes

Copilot

Pricing

My Library

Spanish (es)

Save

El papel de los robots en el aula de primaria:

Este artículo explora la relación entre la robótica y la educación, cómo la robótica puede integrarse en el currículo científico e interdisciplinario.

La robótica en primaria puede enseñar a los estudiantes a resolver problemas y STEM (Ciencia, Tecnología, Ingeniería y Matemáticas).

Este artículo ofrece una lista de robots educativos que pueden ser utilizados en el aula para fomentar la creatividad.

Este artículo profundiza en el papel multifacético de los robots en el aula de enseñanza y aprendizaje, fomentando la creatividad y el juego.

Este artículo ofrece una visión general sobre cómo los robots pueden ser utilizados en el aula para mejorar el aprendizaje de los robots y cómo esta tecnología puede ser utilizada.

Home / Papers / Ways of Qualitative Coding: A Case Study of Four Strategies for Resolvi...

Proceedings Article • DOI •

Save

Ways of Qualitative Coding: A Case Study of Four Strategies for Resolving Disagreements

Bonnie Chinh ¹, Himanshu Zade ¹, Abbas Ganji ¹, Cecilia Aragon ¹ • Institutions (1) ▾

02 May 2019 • ▾

TL;DR: A case study to evaluate four strategies of disagreement resolution in the coding process finds that an open discussion and the n-ary tree metric lead coders to focus more on the disagreement of a particular data instance, whereas kappa values and Code Wizard directcoders to compare code definitions.

[View 18 related papers](#) >

Abstract: The process of qualitative coding often involves multiple coders coding the same data to ensure reliable codes and a consistent understanding of the codebook. One aspect of qualitative coding includes resolving disagreements, where coders discuss differences in coding to reach a consensus. We conduct a case study to evaluate four strategies of disagreement resolution and understand their impact on the coding process. We find that an open discussion and the n-ary tree metric lead coders to focus more on the disagreement of a partici ...read more

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Explain Abstract of this paper in 2 lines >

Conclusions from the paper >

Results of the paper >

Methods used in this paper >

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Related papers16
References4
Authors1
Contributing institutions1
Related topics Copilot

Spanish (es) ▾

Standard

 High Quality NEW

Conclusions from the paper

1:16 PM

Conclusiones del documento:

- El proceso de codificación cualitativa a menudo implica que varios codificadores codifiquen los mismos datos para garantizar la fiabilidad. ...Read more

  Write a feedback

1:15 PM

1 Sources ▾

 Save to Notebook  Follow up 

debilidades de la metodología

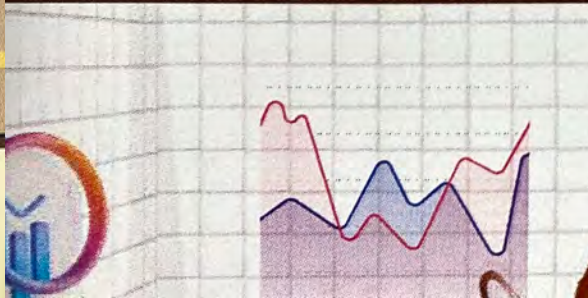
1:17 PM

Debilidades de la metodología:

- El estudio de caso solo evaluó cuatro estrategias

Explain Abstract of this paper in 2 lines, Cc +12 more >

Write your question...





In the 70s, Haring study showed with might, that pictures with text aid children's insight.



Also behaviorism ruled, but cognitivism's value was duly schooled, the two to optimize learning anew.

The Adventures of Mr. Anderson

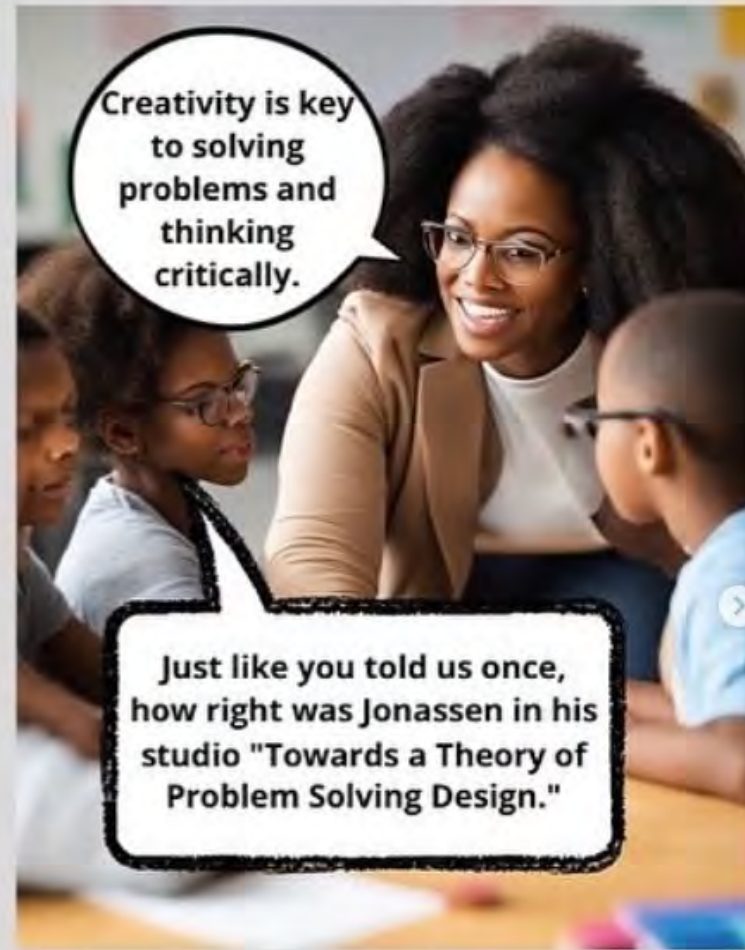
#RICT2324



Today we will do a different dynamic. We are going to work in two groups. One will



I know I shouldn't get excited and abuse technology. As Clark said, it is necessary and effective to provide instruction, but it is never directly responsible for learning.



Creativity is key to solving problems and thinking critically.

Just like you told us once, how right was Jonassen in his studio "Towards a Theory of Problem Solving Design."

“WHAT IS THE META-ANALYTIC EVIDENCE ABOUT SCREENS, SOCIAL MEDIA AND CHILDREN AND ADOLESCENTS?”

	PERPLEXITY	DEEPSEEK	CHATGPT
WHAT DO THEY SAY?	High screen time linked to depression, anxiety, sleep, obesity. Worse for girls.	Might affect sleep/mood. With balance and positive use, it's helpful.	Small effects. Depends on how/why/when. Can be neutral/positive.
HOW DO THEY SAY IT?	Key points in summary.	Paragraphs with key points, ending in summary.	4 short points, examples, final summary.
SOURCES	Gives them right away.	No sources unless asked.	Mentions studies, no sources unless asked.
UP TO DATE?	Yes	Yes	Yes
AGREEMENT	No, more negative.	Agrees with ChatGPT: focus on balance and education.	Agrees with DeepSeek: small effects if used responsibly.
REFLECTION	All three recognize that screen time can affect youth's mental health. None of them take an extreme view. They focus on context, balance and individual differences. We trusted ChatGPT more, because it gives a more balanced and thoughtful explanation. These tools reinforce the idea that screens are not necessarily dangerous if they are used with caution.		

What kinds of educational
action *become imaginable* once
AI enters the classroom?

1. INSTRUMENTAL TECHNICAL - FUNCTIONAL

Focuses on *what this tech does*:
the tools, features, and efficiencies AI brings
to teaching and learning. Asks whether AI
merely optimises existing practice or
radically re-shapes it.



Home / Papers / Ways of Qualitative Coding: A Case Study of Four Strategies for Resolvi...

Proceedings Article • DOI •

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(6 msg)

Ways of Qualitative Coding: A Case Study of Four Strategies for Resolving Disagreements

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Conclusions from the paper

1:16 PM

****Conclusiones del documento:****

- El proceso de codificación cualitativa a menudo implica que varios codificadores codifiquen los mismos datos para garantizar la fiabilidad. ...Read more

  Write a feedback

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1 Sources ▾

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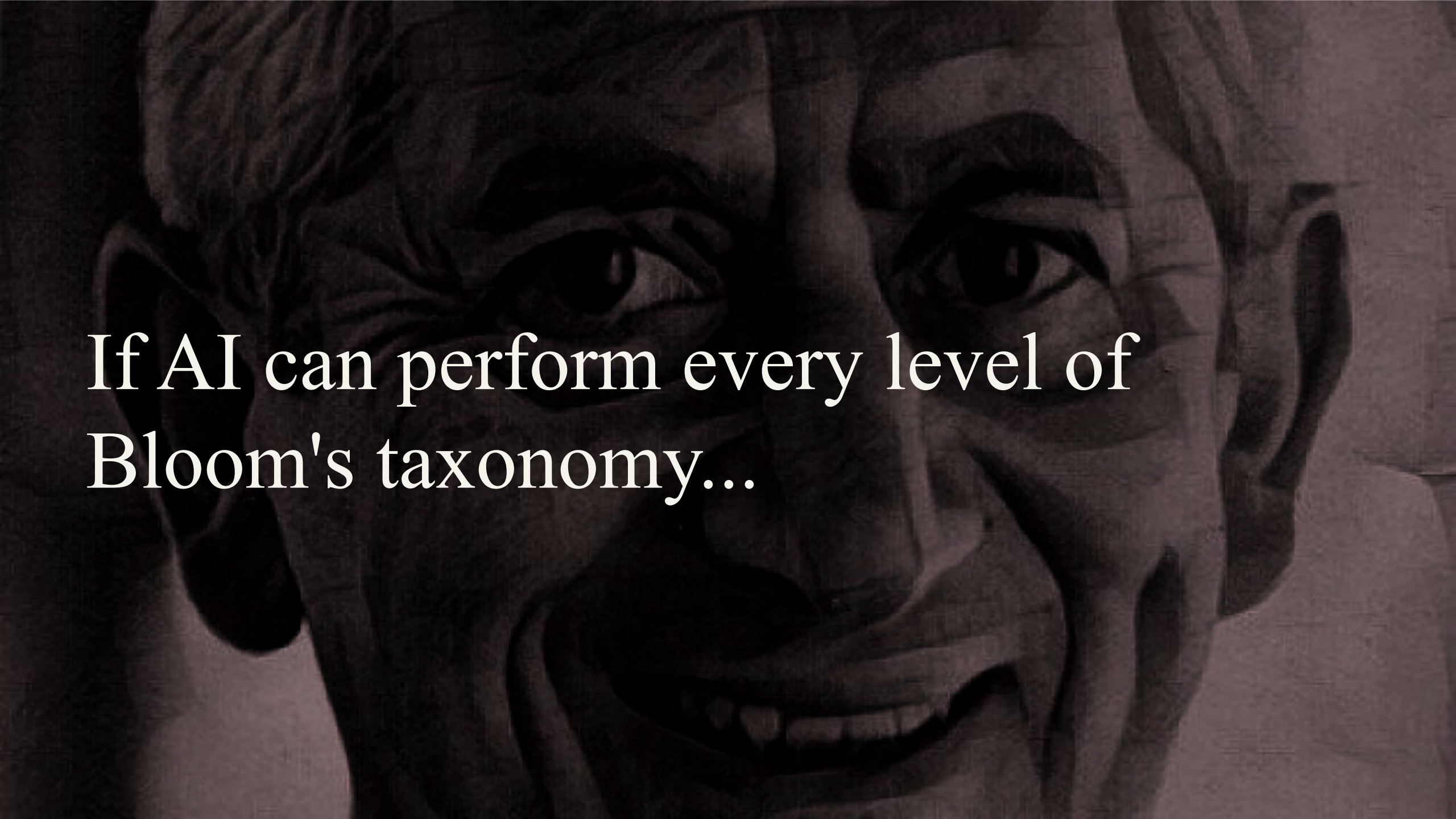
debilidades de la metodología

1:17 PM

****Debilidades de la metodología:****

- El estudio de caso solo evaluó cuatro estrategias

IS THIS COGNITION?



If AI can perform every level of
Bloom's taxonomy...

If knowledge can now be
statistically generated without
understanding, what exactly have
we been calling knowledge all
this time?

If knowledge can now be
statistically generated without
understanding, what exactly

**ARE WE EDUCATING PEOPLE
FOR?**

2. EPISTEMOLOGICAL

Questions how AI *redraws our definitions* of knowledge, evidence, and learning itself. Probes whether machine-generated insight counts as understanding.







Which educational
responsibilities
cannot be delegated?

What kinds of *responsibilities*
emerge once *agency is distributed*
between humans and non-
humans?



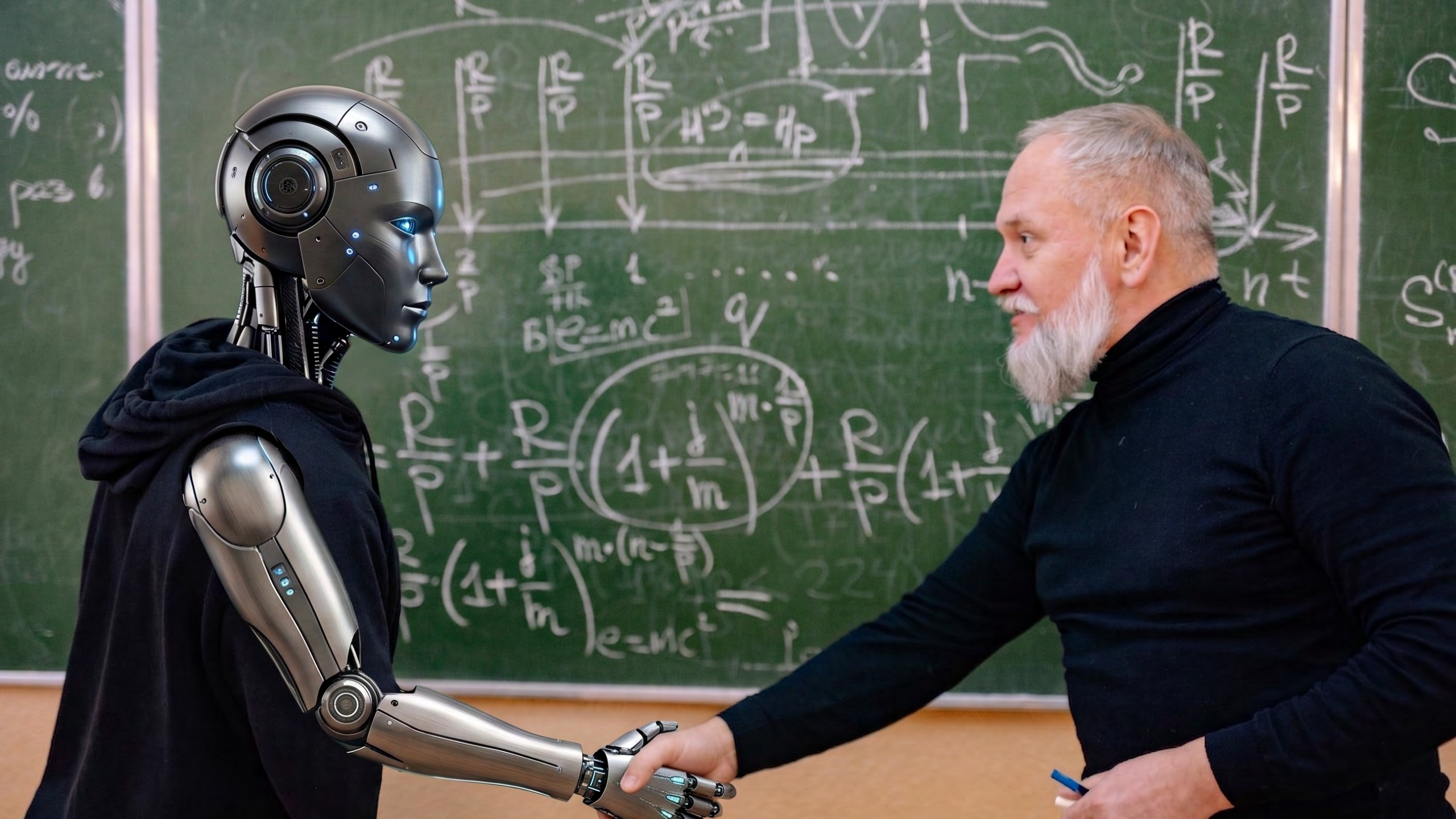
Scrutinises *norms, values, and responsibilities: bias, privacy, transparency, and accountability in algorithmic decisions* that affect learners.

Moves the debate from can we to should we.

3. ETHICAL







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gy

$$\frac{R}{P} \frac{dP}{dt} = \frac{R}{P} \frac{dP}{dt} \quad \frac{R}{P} \frac{dP}{dt} = \frac{R}{P} \frac{dP}{dt} \quad \frac{R}{P} \frac{dP}{dt} = \frac{R}{P} \frac{dP}{dt}$$
$$H^2 = H_P$$
$$\frac{SP}{H_P} \quad 1 \quad \dots \quad n$$
$$B|e=mc^2 \quad q$$
$$\frac{R}{P} + \frac{R}{P} \left(1 + \frac{j}{m} \right) + \frac{R}{P} \left(1 + \frac{j}{m} \right)$$
$$\frac{R}{P} \cdot \left(1 + \frac{j}{m} \right)^{m \cdot (n - \frac{1}{P})} = 224$$
$$e=mc^2$$

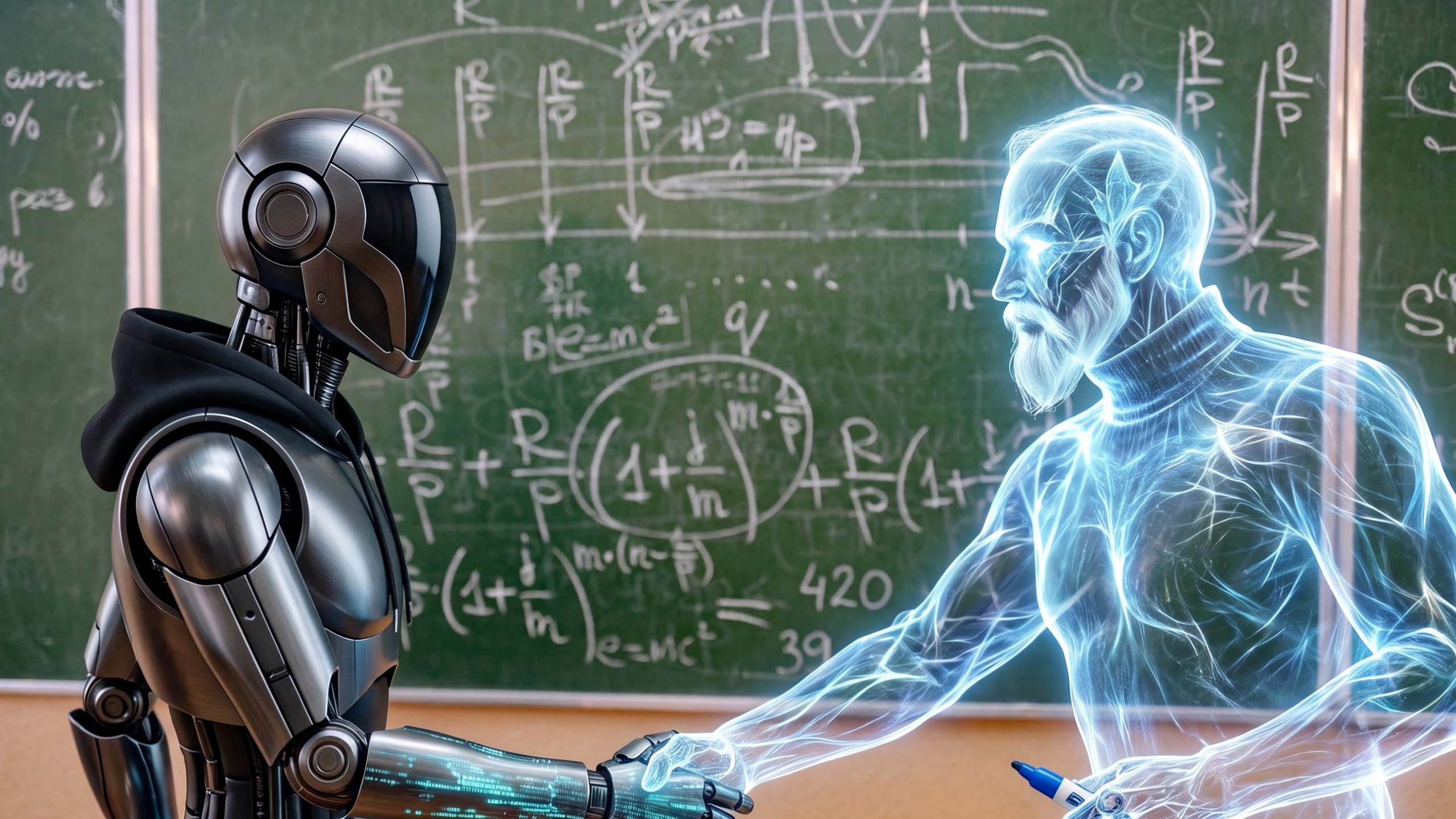
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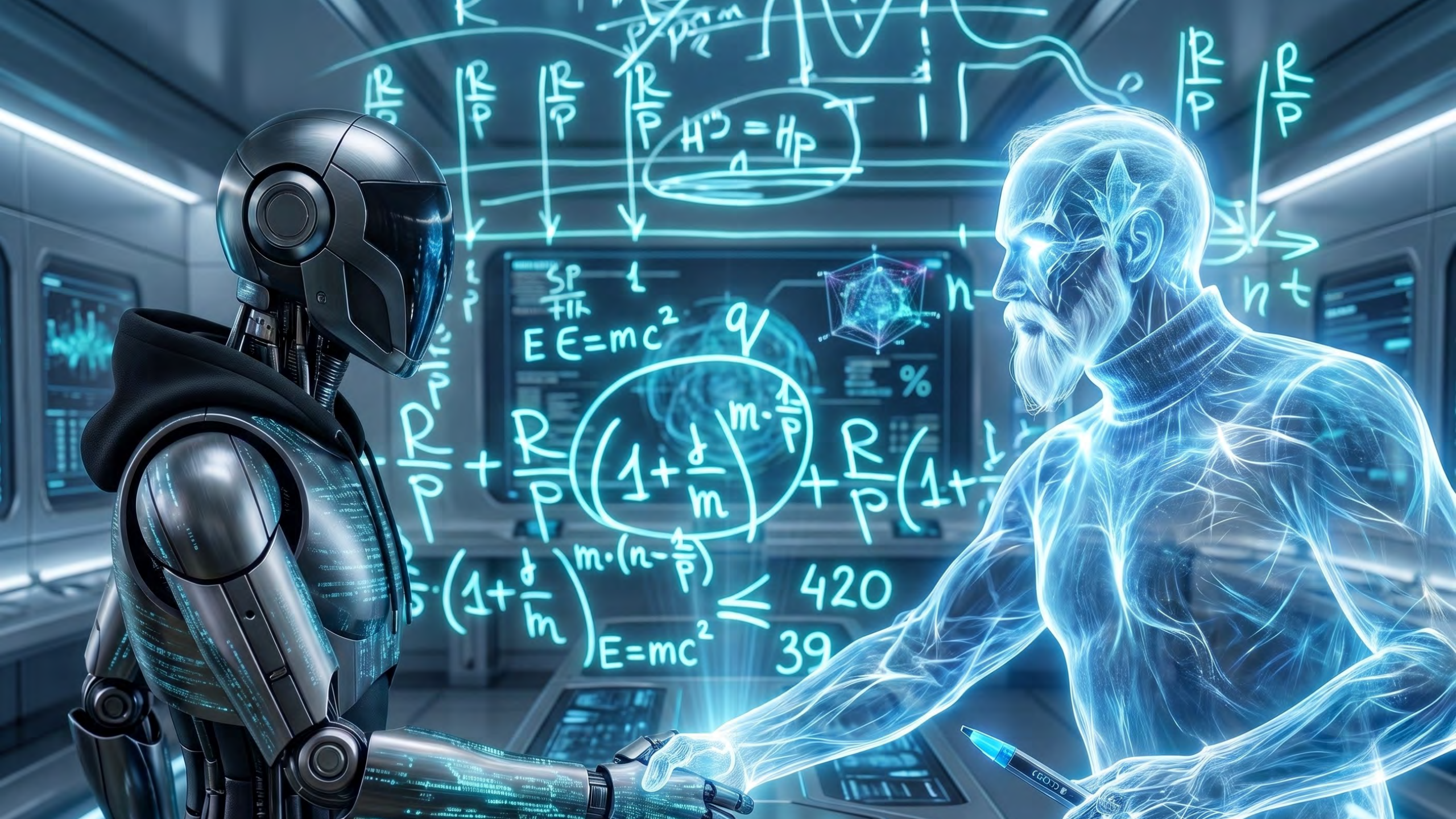
$$E=mc^2$$

$$R/p + R/p \cdot \left(1 + \frac{j}{m}\right) + R/p \cdot \left(1 + \frac{j}{m}\right) \cdot m \cdot \left(n - \frac{4}{p}\right) = 224$$

$$e=mc^2$$







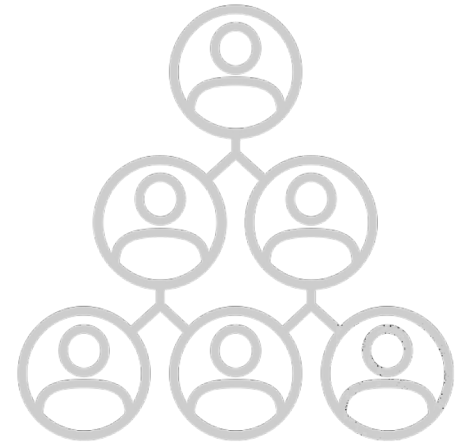


What makes a learning
relationship *educational* rather
than *merely informational*?



What kinds of *human
communities* does AI make
easier—or harder—to build??

What makes someone *part of a learning community* rather than just *part of the information flow*?



Explores how AI reshapes the social fabric of education: *relationships, trust, belonging, agency, and participation in learning communities.*

4. SOCIAL

How does AI redistribute the
capacity to *decide*
what education is?

When platforms shape
educational choices, *who is
actually making the decisions?*

Whose *vision of education* has
become so normal that it no
longer looks like
a *political choice*?



THEME 1

THEME 2

THEME 3

THEME 4

Can AI *expand democratic participation* without replacing democratic deliberation?

5. POLITICAL

Examines *how AI redistributes educational power*: who gets to decide what education values, who participates in those decisions, and whose interests are ultimately served.





When your *educational strategy*
depends on *someone else's*
product strategy... whose strategy
are you actually following?

What *kind of education becomes possible* when educational problems are also *market opportunities*?



6. COMMERCIAL

and market

Explores how market logics shape educational priorities, asking when business models begin to redefine educational possibilities. Examines *dependencies, incentives, and the tension between public purpose and private value.*



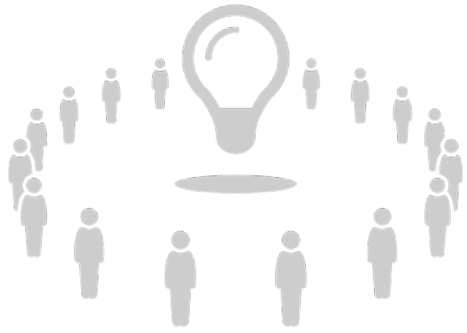
EFFICIENCY

PERSONALIZED

OPTIMISED

Which *vision of education* has
THIS AI quietly taught us to
desire?

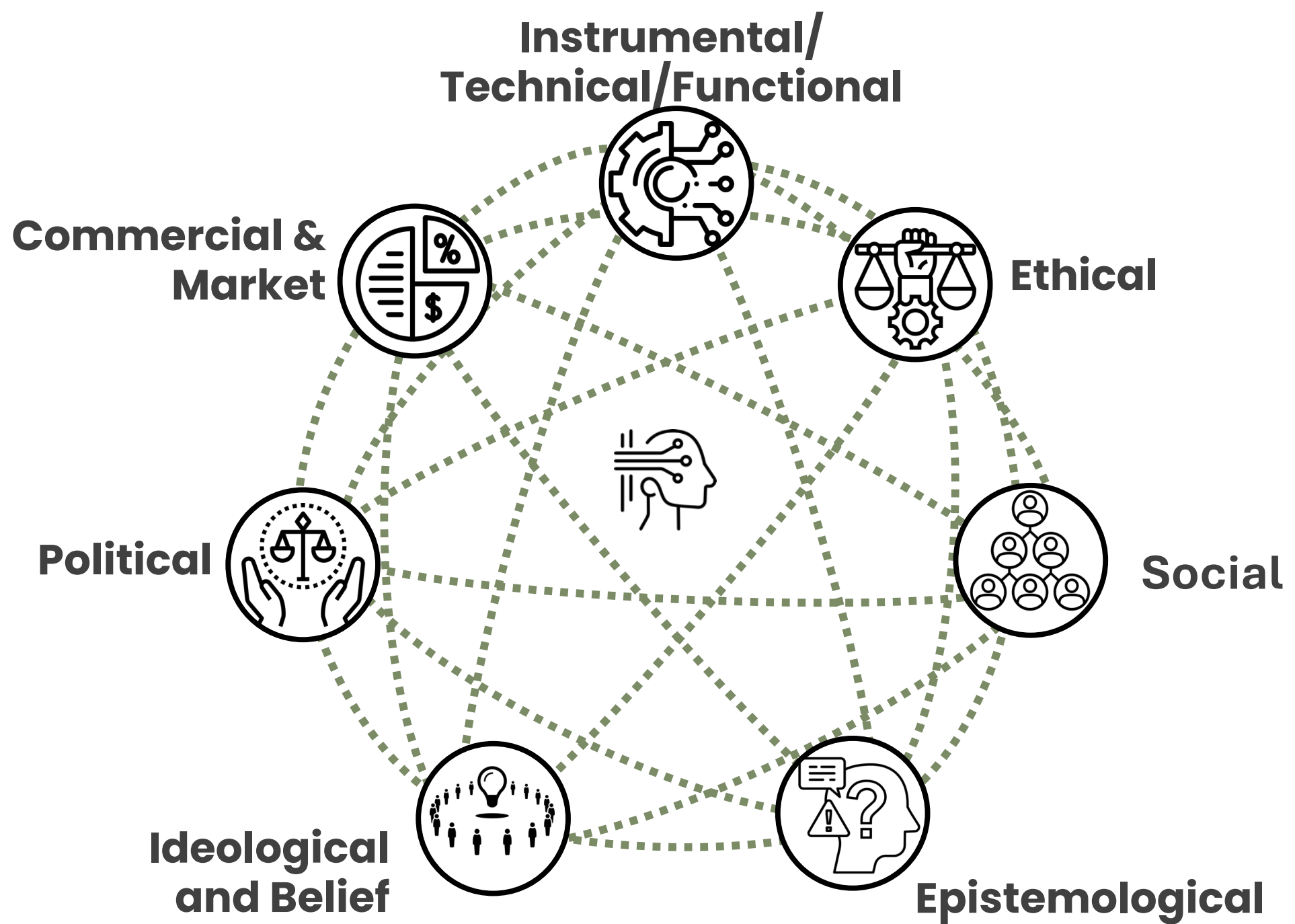
What *futures of education*
become *imaginable*—and which
ones quietly disappear?

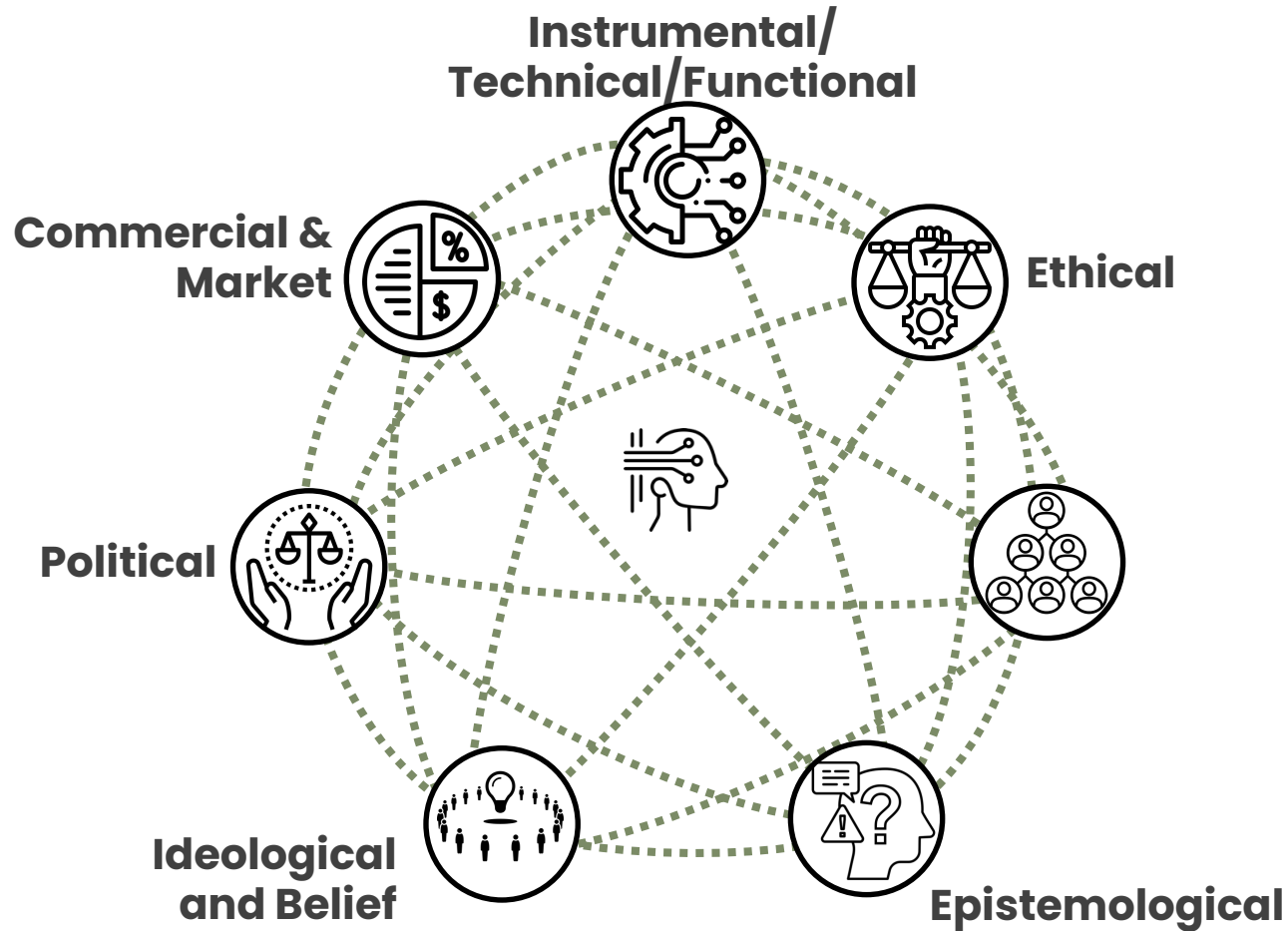


Interrogates the visions of "*good education*" embedded in AI—not as explicit objectives, but as assumptions about what learning should be, what teachers should do, and what students should become.

7. IDEOLOGICAL and belief

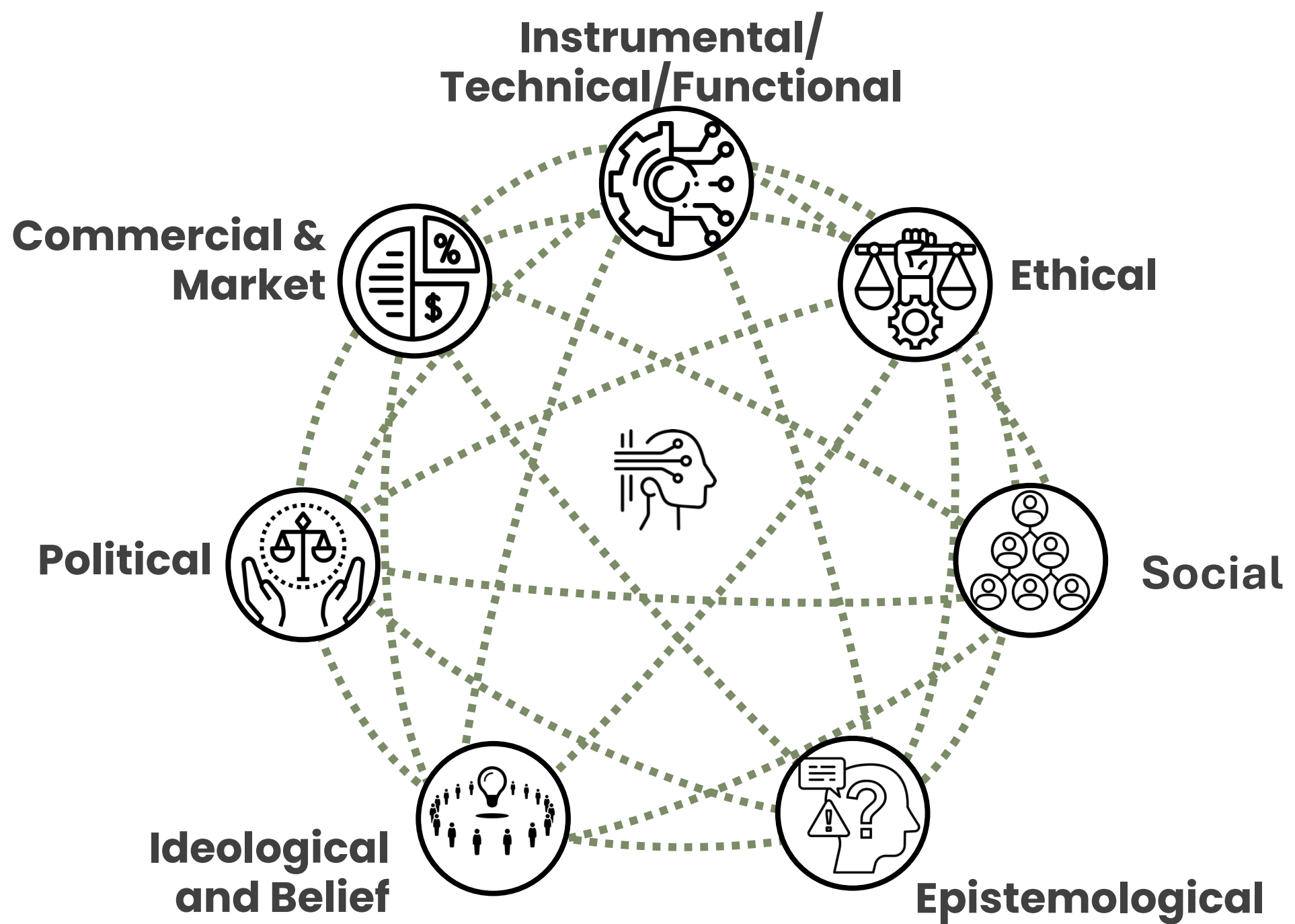






Castañeda, Linda; Arroyo-Sagasta, Amaia & Postigo-Fuentes, Ana Yara. (In Press) **When Digital Literacy Must Go Beyond the Screen: further dimensions for analysing the AI impact in education**. In Flynn, N., Garcia, P. O., Joseph, H., Powell, D., & Slater, W. H. (Eds.) (In press). *The Bloomsbury International Handbook of Literacy*. London, UK: Bloomsbury Press.

Castañeda, Linda; Postigo-Fuentes, Ana Yara & Arroyo-Sagasta, Amaia (2025). **Beyond Tools, Toward Power Structures: A Critical Review of AI in Primary Education**. *Revista Española de Educación Comparada* (48), 73–95.
<https://doi.org/10.5944/reec.48.2025.45126>



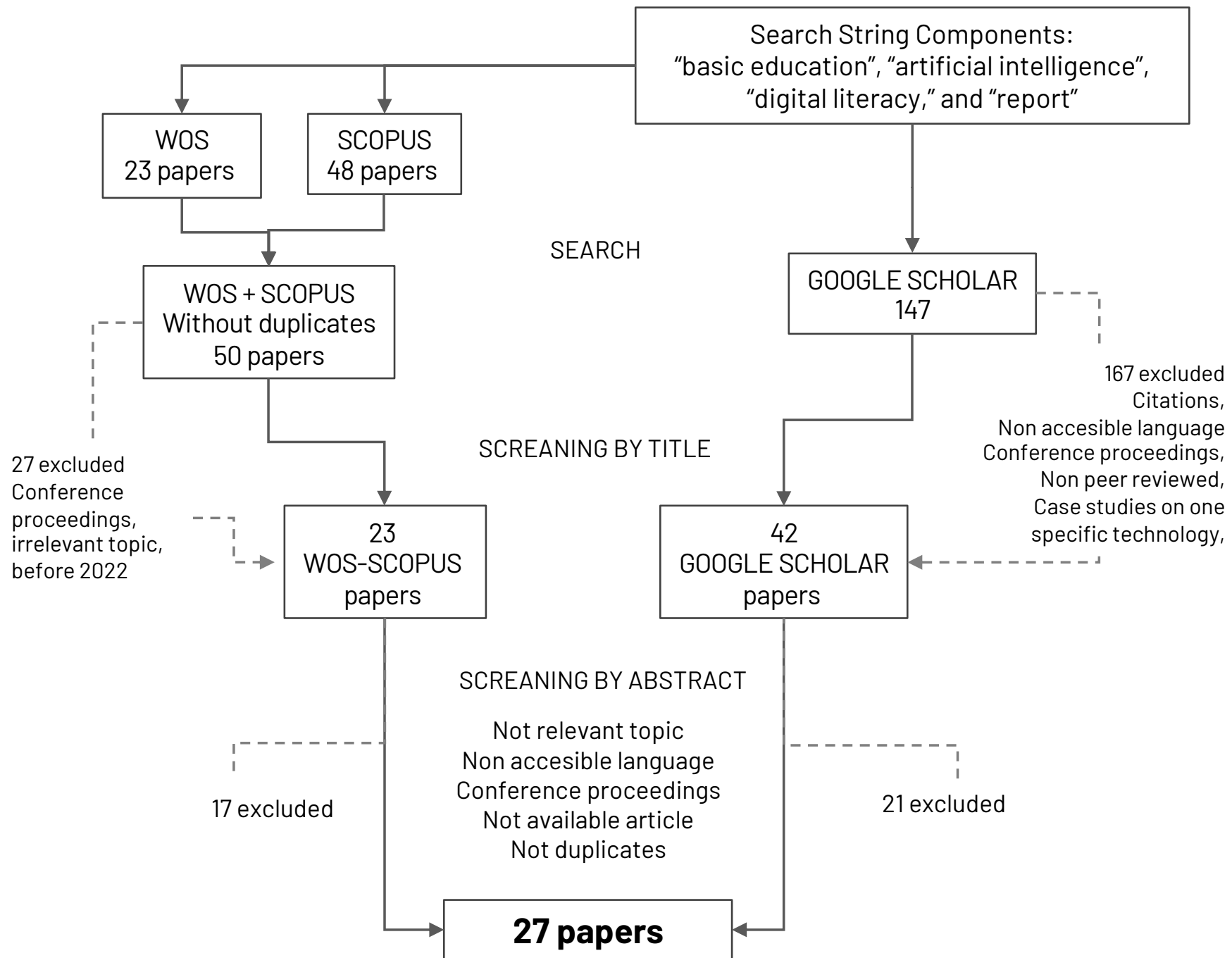
TERMS

	Original	Enhanced Using AI (<i>Prompt-perfect</i>)	Final
PRIMARY SCHOOL	“primary education” OR “primary School*” OR “K-12” OR “basic education”.	“primary education” OR “primary School*” OR “K-12” OR “basic education”.	“primary education” OR “primary School*” OR “K-12” OR “basic education”.
AI	(“artificial intelligence” OR “machine intelligence” OR “intelligent support” OR “intelligent virtual reality” OR “chat bot*” OR “machine learning” OR “automated tutor” OR “personal tutor*” OR “intelligent agent*” OR “expert system” OR “neural network” OR “natural language processing” OR “intelligent tutor*” OR “adaptive learning system*” OR “adaptive educational system*” OR “adaptive testing” OR “decision trees” OR “clustering” OR “logistic regression” OR “adaptive system*”). (By Bond et al, 2024)	("artificial intelligence" OR "machine intelligence" OR "intelligent support" OR "intelligent virtual reality" OR "chat bot*" OR "machine learning" OR "automated tutor" OR "personal tutor*" OR "intelligent agent*" OR "expert system" OR "neural network" OR "natural language processing" OR "intelligent tutor*" OR "adaptive learning system*" OR "adaptive educational system*" OR "adaptive testing" OR "decision trees" OR "clustering" OR "logistic regression" OR "adaptive system*" OR "deep learning" OR "reinforcement learning" OR "knowledge representation" OR "fuzzy logic" OR "computer vision")	("artificial intelligence" OR "machine intelligence" OR "intelligent support" OR "intelligent virtual reality" OR "chat bot*" OR "machine learning" OR "automated tutor" OR "personal tutor*" OR "intelligent agent*" OR "expert system" OR "neural network" OR "natural language processing" OR "intelligent tutor*" OR "adaptive learning system*" OR "adaptive educational system*" OR "adaptive testing" OR "decision trees" OR "clustering" OR "logistic regression" OR "adaptive system*" OR "deep learning" OR "reinforcement learning" OR "knowledge representation" OR "fuzzy logic" OR "computer vision")
DIGITAL COMPETENCE	(“Digital literacy” OR “digital competence”)	("digital literacy" OR "digital competence" OR "digital skills" OR "digital fluency" OR "ICT literacy" OR "technology literacy" OR "computer literacy" OR "information literacy")	("digital literac*" OR "digital competence*" OR "digital skills" OR "digital fluenc*" OR "ICT literac*" OR "technology literac*" OR "computer literac*" OR "information literac*")
SOURCE	(report*)	(report* OR paper* OR analysis OR review* OR "white paper*").	(report* OR paper* OR analysis OR review* OR "white paper*").

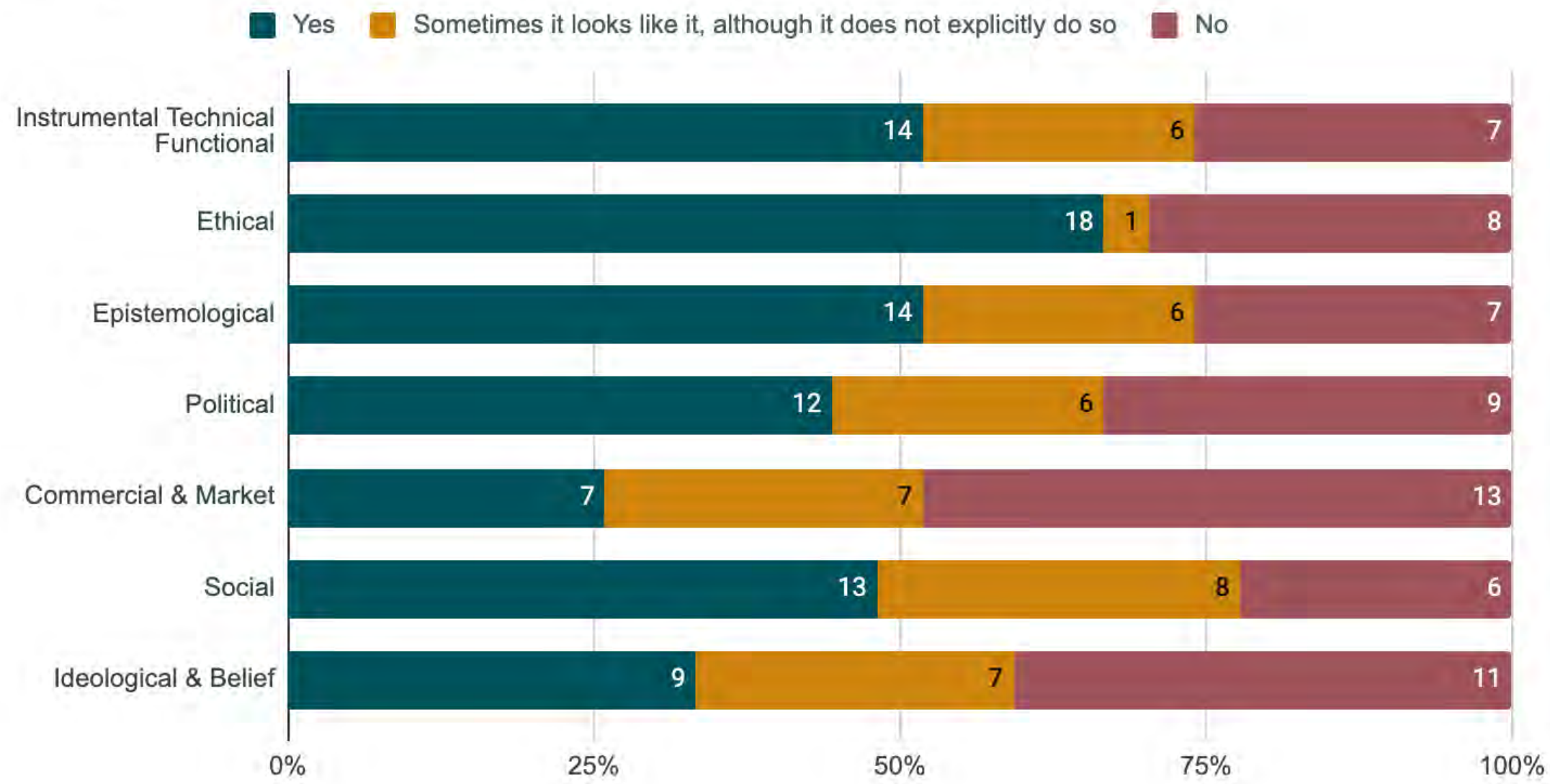
Original

Enhanced
Using AI (*Prompt-perfect*)

Final



AI in Primary School literature Review. Thematic analysis.



INSTRUMENTALISED

ethically *SHALLOW*

epistemologically *THIN*

politically *BLIND*

socially *FRAGMENTED*

commercially *UNDER-EXAMINED*

ideologically *BLURRED*

Is not a gap,
is *selective*

BLIND-SPOTTED

INSTRUMENTALISED

ethically *SHALLOW*

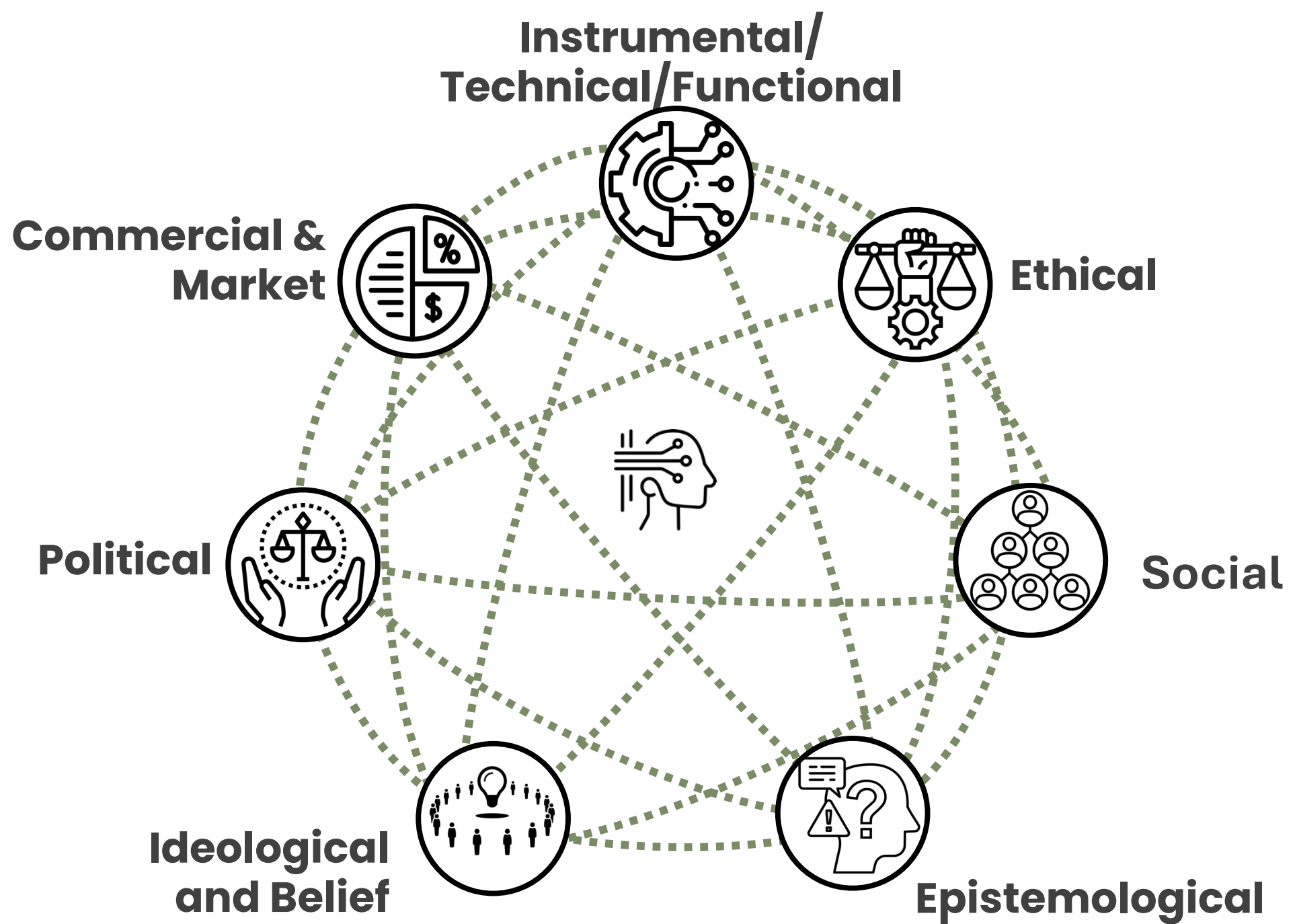
epistemologically *THIN*

politically *BLIND*

socially *FRAGMENTED*

commercially *UNDER-EXAMINED*

ideologically *BLURRED*





Cracks in the Prism



The prism is not neutral

White light
was *never white*



There was *NEVER White* light

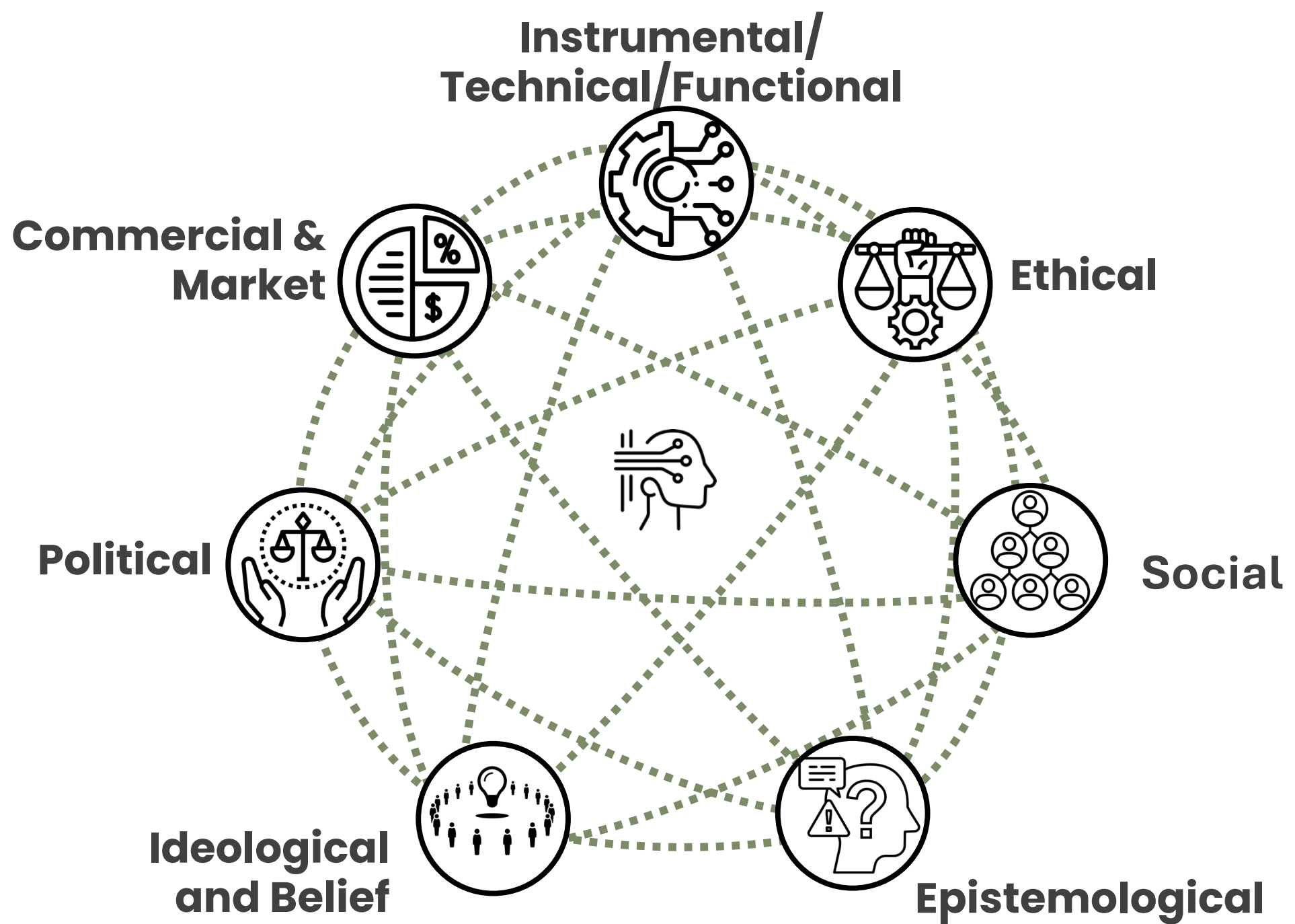


Education has always been *sociomaterial*

A close-up photograph of a person's hands holding a large, clear, faceted crystal. The person has dark nail polish. In the background, a traditional tea set is visible on a wooden tray, including a dark teapot, a light green cup, and a small bowl of tea. The scene is softly lit, creating a calm and contemplative atmosphere.

Revelation is an achievement of *analysis*

Every powerful metaphor
eventually starts *hiding* as much
as it *reveals*





What *kind of education* is your
work with AI helping to produce?

Linda Castañeda



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Publications – Writing – Teaching – Research – Open resources – Mushware

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EDUCATIONAL OPTICS

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PRISM



LENS



MIRROR



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