
**Ανοικτά Διαδικτυακά Σεμινάρια,**
**Παν. Πελοποννήσου**
***28 Ιανουαρίου 2026***

GSIC-EMIC
Educación, Medios, Informática y Cultura


# Κίνδυνοι και δυνατότητες της τεχνητής νοημοσύνης στην εκπαίδευση: Μια κριτική θεώρηση

# Risks and opportunities of artificial intelligence in education: A critical view

Prof. Yannis Dimitriadis

GSIC/EMIC group
University of Valladolid, Spain

# (Gen)AI(Ed) in the literature
## Can we say something new?

**Πρόγραμμα σεμιναρίων**

| Ημερομηνία | Διάλεξη | Παρουσίαση |
|---|---|---|
| 5 Νοεμβρίου | Μανώλης Κουτούζης, Πρύτανης Ελληνικού Ανοικτού Πανεπιστημίου<br>***Μπορεί ένα σχολείο να μαθαίνει; Προβληματισμοί και μετασχηματισμοί στην εποχή της Τεχνητής Νοημοσύνης*** | Παρουσίαση |
| 19 Νοεμβρίου | Κώστας Δημόπουλος, Καθηγητής Πανεπιστημίου Πελοποννήσου, Εθνικός Συντονιστής Προγράμματος PISA<br>***Εικοσιπέντε χρόνια συμμετοχής της Ελλάδας στην έρευνα PISA: Συμπεράσματα και Προοπτικές*** | Παρουσίαση |
| 3 Δεκεμβρίου | Μιχάλης Μπλέτσας, Media Lab MIT, Εθνική Αρχή Κυβερνοασφάλειας<br>***Η Τεχνητή Νοημοσύνη στην εκπαίδευση: Μια δύσκολη συμβίωση που μπορεί να γίνει καλύτερη*** | |
| 17 Δεκεμβρίου | Δημήτρης Σάμψων, Καθηγητής Πανεπιστημίου Πειραιά<br>***Ευκαιρίες και προκλήσεις από την αξιοποίηση της Τεχνητής Νοημοσύνης στη Εκπαίδευση*** | |
| 14 Ιανουαρίου | Νικόλαος Μήτρου, Ομότιμος Καθηγητής Εθνικού Μετσόβιου Πολυτεχνείου<br>***Το ψηφιακό σύγγραμμα στην Εκπαίδευση: η Δράση ΚΑΛΛΙΠΟΣ*** | Παρουσίαση |
| 28 Ιανουαρίου | Γιάννης Δημητριάδης, Καθηγητής Πανεπιστημίου Valladolid, Ισπανία<br>***Κίνδυνοι και δυνατότητες της Τεχνητής Νοημοσύνης στην εκπαίδευση: Μία κριτική θεώρηση*** | |

- AIED2025: 800+ submissions
- Scholar: 23900+ papers since 2022

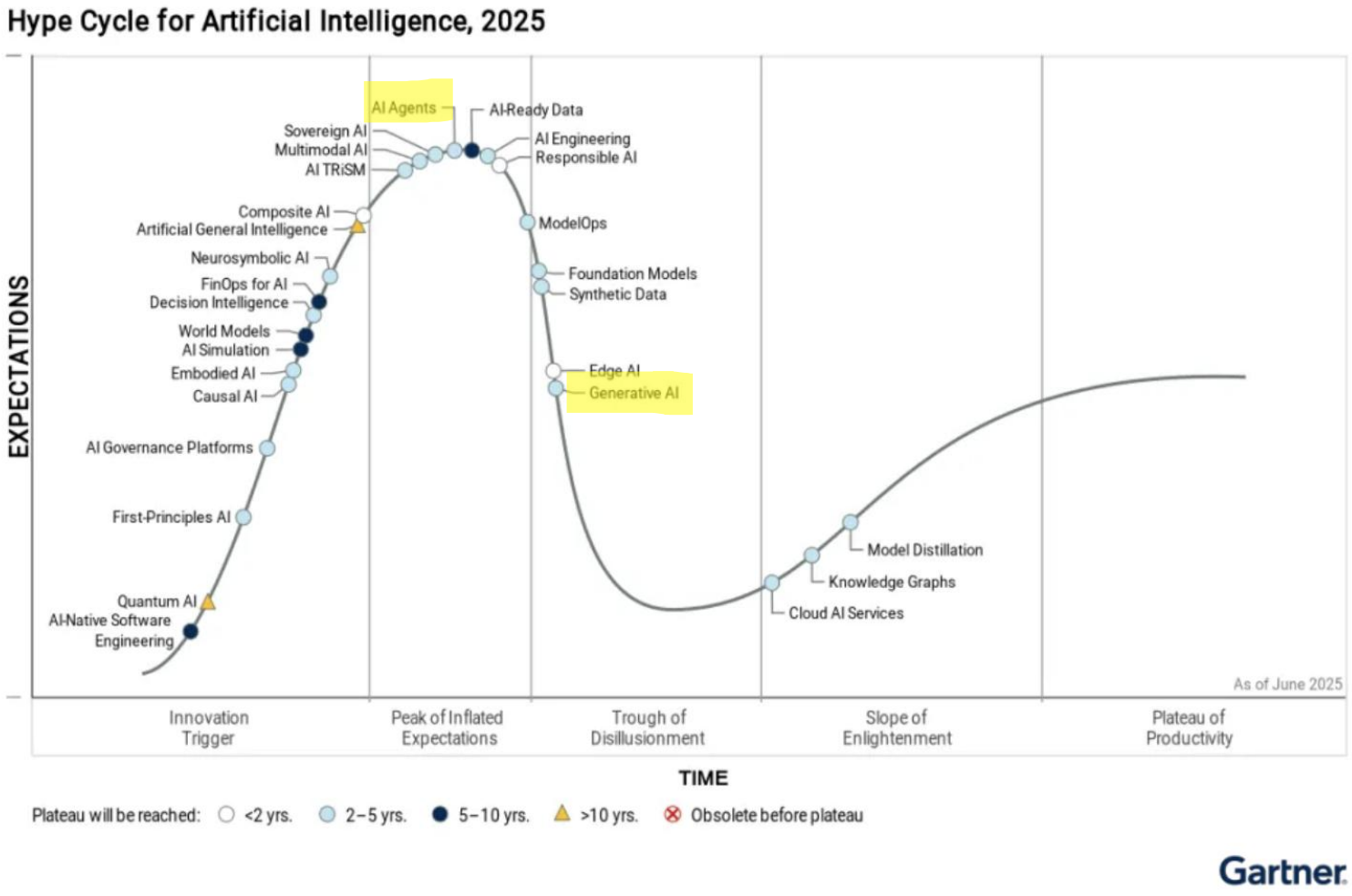
# Some key issues for (Gen)AI(Ed)

- How can we conceptualize (Gen)AI(Ed) as a socio-technical system?
- Why critical thinking and agency are crucial aspect for students, teachers, policy makers and researchers?
- Should ethical issues be tackled by design?
- Why human-centered and value-sensitive approaches are high priority?

# Technology Ecosystem & Education

- Where is the focus?
  - Technology-Enhanced Learning or Technology in Education/Educational Technology
- Some instances in Educational Technology
  - Digital Media → Educational Resources
  - Data Science → Learning Analytics
  - Artificial Intelligence → AIEd
  - Generative AI → (Gen)AIEd
- Technology features and values prevail
- The ecosystem of technology is dominant

# GenAI in the Gartner Hype Cycle




https://www.gartner.com/en/newsroom/press-releases/2025-08-05-gartner-hype-cycle-identifies-top-ai-innovations-in-2025/

# GenAI: Hype or not?

- GenAI is entering the disillusionment phase
  - Plateau to be reached in 2-5 years
- Agentic/Autonomous AI is at the peak phase
  - "*Technologies evolving toward systems that can act with minimal human oversight*"
- Human augmentation and AI / human-machine partnership are persistent themes
- Responsible AI is strategic
  - Trust, security, resilience and ethics

# GenAI as socio-technical system

"***Techno-Societal Fragility***. *As technology becomes increasingly embedded in society, more aspects of daily life fade into the background; the risks of societal disruption, disinformation, privacy erosion, and other threats increase. The downsides of AI aren't just side-discussions now. They are strategic imperatives. Organizations (and governments) must balance innovation with pragmatism, resilience, trust, and ethics. Do you have a strategy and budget for safety and resilience, in addition to speed and efficiency?"*

https://blog.capitalogix.com/public/2025/11/a-look-at-gartners-2025-hype-cycle-for-emerging-technologies/

•**Augmented Humanity** represents the evolution of the human-machine partnership. The

# GenAI: Hype or not?

"***Augmented Humanity*** *represents the evolution of the human-machine partnership. The goal isn't to replace humans, but to amplify them. This is clearly a topic we discuss frequently. AI won't take most people's jobs, but someone who uses AI effectively will. What upskilling, training, or redesign of roles will be required to shift from "humans doing tasks" to "humans supervising and collaborating with systems?"*

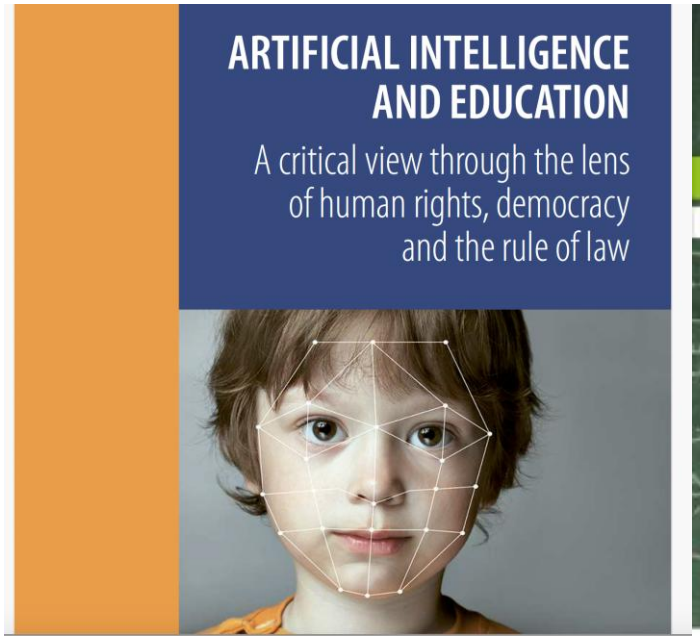
https://blog.capitalogix.com/public/2025/11/a-look-at-gartners-2025-hype-cycle-for-emerging-technologies/

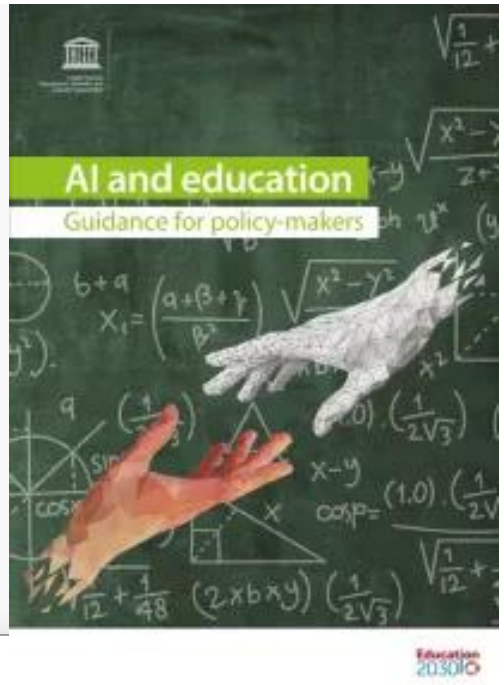
# (Gen)AI: Hype or not?

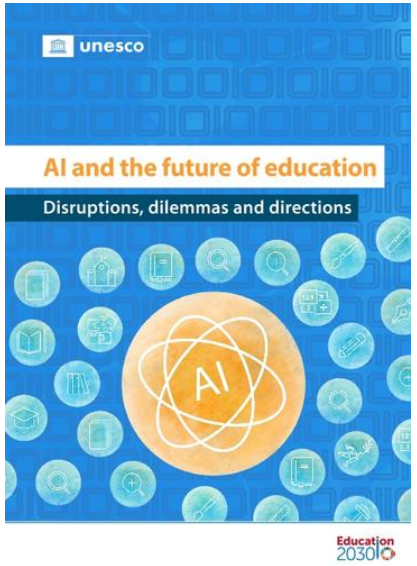
- GenAI: A scientific-technological revolution?
  - Do we have a "*linear unstoppable progress*"?
  - Do we need to "*adapt or die*"?
- It becomes a technological commodity but
  - "*Access is not ownership*"
  - "*Tech industry is the landlord, the judge of education technology, the adult at the table in educational policy*"

# *BigTech* and Policies (I)

## Power imbalance





TECHNOLOGY

**Meta, TikTok and YouTube are on trial over whether their apps hurt children**

JANUARY 27, 2026 · 5:00 AM ET

HEARD ON MORNING EDITION

Shannon Bond

# *BigTech* and Policies (II)
## Power imbalance

- Unesco manifestos for (Gen)AIEd
- Critical analysis by Council of Europe
- AI Act by the European Commission
- Fines to *BigTech* by European Justice Court
- Trials regarding Social Media and youth

But is there any visible effect of regulations and democratic control?

# (Gen)AI(Ed) a sociotechnical system

- Technology push is leading over education, pedagogy, learning science
- A big power imbalance exists between *BigTech* and political/educational actors
- GenAI as revolution or hype
- The ethical issues of transparency, trust, agency, responsibility, autonomy, sovereignty are critical
- Humans only, Human-AI partnerships or Autonomous Agentic systems?

# Do (Gen)AI intrinsic risks exist? (I)

- Data-driven models, like LLMs, are intrinsically non-transparent
  - Explainable AI aims at providing some kind of hints on "reasoning" about the decisions
  - Knowledge-based AI is more explainable by design, but much more difficult to create/extend
- Power and bias depend on the training data
  - *The business is the data*
  - Privacy by design, local models, fine-tuning may alleviate this concern

# Do (Gen)AI intrinsic risks exist? (II)

- GenAI is stochastic, not deterministic
  - Outputs are just "shaped" through prompting
- GenAIEd does not "know pedagogy"
  - Even if "the most relevant principles of learning sciences created Gemini for Education"
- GenAI needs context
  - Domain experts and designers are crucial
- GenAI outputs always look reasonable
  - No information recovery, factual errors are natural, excessive authority is dangerous

# What is the impact of GenAIEd? (I)

- Potential is amazingly high
  - Personalization, feedback, learning design, …
- Major effect on scaling up, avoiding burn-out, enhancing efficiency and performance

BEHAVIOUR & INFORMATION TECHNOLOGY
https://doi.org/10.1080/0144929X.2024.2394886

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## The promise and challenges of generative AI in education

Michail Giannakos[a,b], Roger Azevedo[c], Peter Brusilovsky[d], Mutlu Cukurova[e], Yannis Dimitriadis[f], Davinia Hernandez-Leo[g], Sanna Järvelä [h], Manolis Mavrikis[e] and Bart Rienties[i]

[a]Department of Computer Science, Norwegian University of Science and Technology (NTNU), Trondheim, Norway; [b]Department of Information Systems, University of Agder, Kristiansand, Norway; [c]School of Modeling Simulation and Training, University of Central Florida, Orlando, FL, USA; [d]School of Computing and Information, University of Pittsburgh, Pittsburgh, PA, USA; [e]UCL Knowledge Lab, Institute of Education, University College London, London, UK; [f]School of Telecommunications Engineering, Universidad de Valladolid, Valladolid, Spain; [g]Department of Information and Communication Technologies, Universitat Pompeu Fabra (UPF), Barcelona, Spain; [h]Learning and Educational Technology (LET) Research Lab, University of Oulu, Oulu, Finland; [i]Institute of Educational Technology, The Open University, Milton Keynes, UK

# What is the impact of GenAIEd? (II)

- Beware of "Fast Science"
  - Technology and profit push
  - Long-term and rigorous studies are necessary

# What is the impact of GenAIEd?(III)

- Cognitive offloading and metacognitive laziness are "natural side effects"
- Performing better is not always synonymous to learning more


EDITORIAL | Free to Read

**Beyond efficiency: Empirical insights on generative AI's impact on cognition, metacognition and epistemic agency in learning**

Lixiang Yan, Viktoria Pammer-Schindler, Caitlin Mills, Andy Nguyen, Dragan Gašević

First published: 24 July 2025 | https://doi.org/10.1111/bjet.70000 | VIEW METRICS

# What are some major goals?

- Reinforce up-skilling and re-skilling, and limit un-skilling
- Urgently support strong metacognition, critical thinking and other major soft skills
- Consider ethical concerns as priority and implement by design
- Enhance human agency and democratic values through human-centered and value-based design of tools and contexts

# Are there any ethical issues with (Gen)AI(Ed)?

- (Gen)AI is powerful and eventually "revolutionary" science and technology
- Its implications for Education (teaching, learning, socialization, etc) are **special**
  - **Education deals with social, (meta)cognitive, epistemic, emotional human activity**
    - Not only oriented to "productivity-efficiency"
- Is there any connection between (Gen)AI(Ed) and society/ethics?

# Old and new "ethics-related" issues

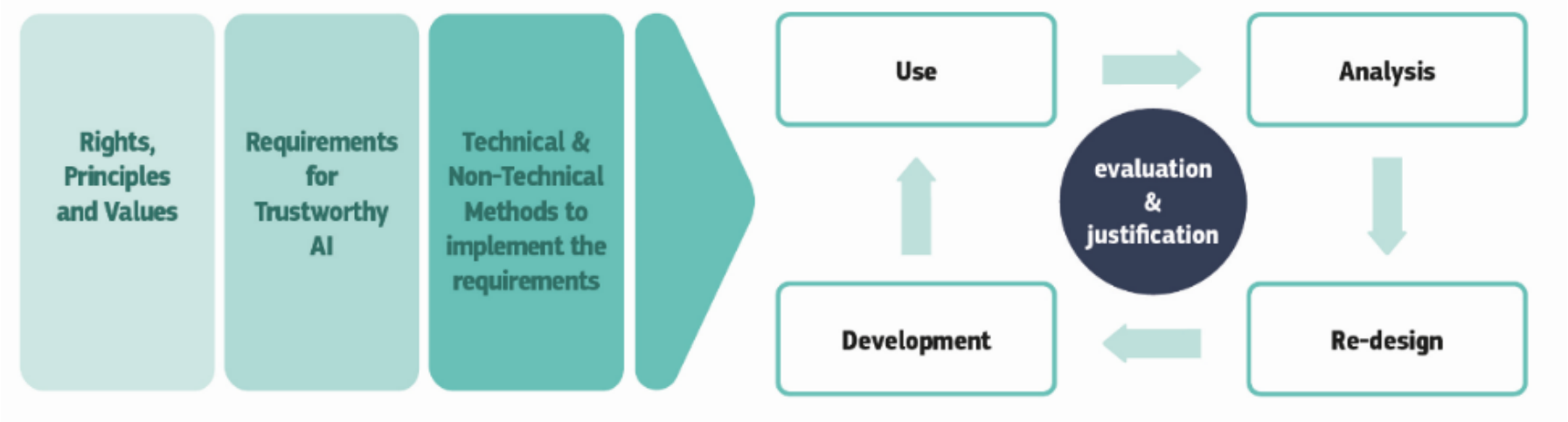
- Most issues are OLD enough
  - Related to AI, Data Science
- But new variants emerge
  - With a much greater and wider impact
- Other issues deal with education only
- Can we ignore these issues?
  - Need to make decisions on ethical dilemmas

# FATE AI principles

- FATE principles
  - Fairness, Accountability, Transparency & Ethics
- European Union Principles for Trustworthy AI
  - Human Autonomy, no Harm, Fairness, Explicability


HLEG-AI (High-Level Expert Group on Artificial Intelligence) (2019), "**Ethics Guidelines for Trustworthy AI: Requirements of Trustworthy AI**," Available: https://ec.europa.eu/futurium/en/ai-alliance-consultation/guidelines/1

# Ethics by design (I)
## The lifecycle of the EU five-Layer model




- EU Commission, Ethics and Research Integrity Sector, DG R&I (2021), “Ethics By Design and Ethics of Use Approaches for
- Artificial Intelligence”
- EU Commission High-Level Expert Group on AI, Ethics Guidelines for Trustworthy Artificial Intelligence (2019). “Ethics guidelines for trustworthy AI”

# Ethics by design (II)
## The basic concept

- Include "ethics challenges" as constraints/ variables in a design "optimization problem"
- Valid for any design, development and use project of (Gen)AI(Ed)
- Formal solutions necessary but insufficient
  - Explainable AI, Privacy by Design

EU Commission, Ethics and Research Integrity Sector, DG R&I (2021), "Ethics By Design and Ethics of Use Approaches for Artificial Intelligence"

# Ethics by design (III)
## And a snapshot

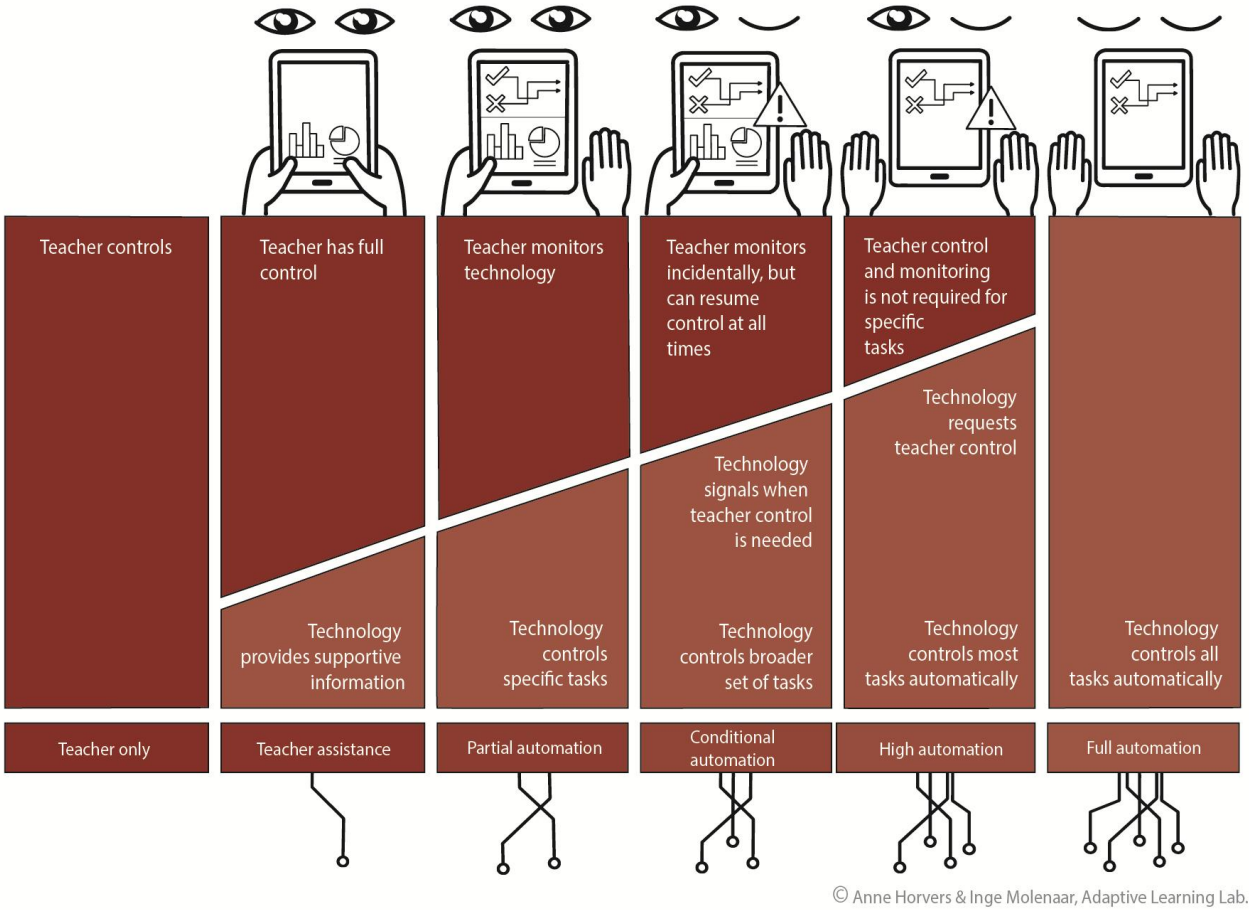
- Conduct ethical **risk/impact assessment**
- Ensure there is no aspect of the AI system which could be **mistaken for a human**
- Design an **auditable mechanism** to record the data management cycle
- Ensure data about people is **representative** and reflects **diversity** / is sufficiently **neutral**
- Whenever possible follow **sustainable energy** usage practices

EU Commission, Ethics and Research Integrity Sector, DG R&I (2021), "Ethics By Design and Ethics of Use Approaches for Artificial Intelligence"

# Why human agency is so relevant?

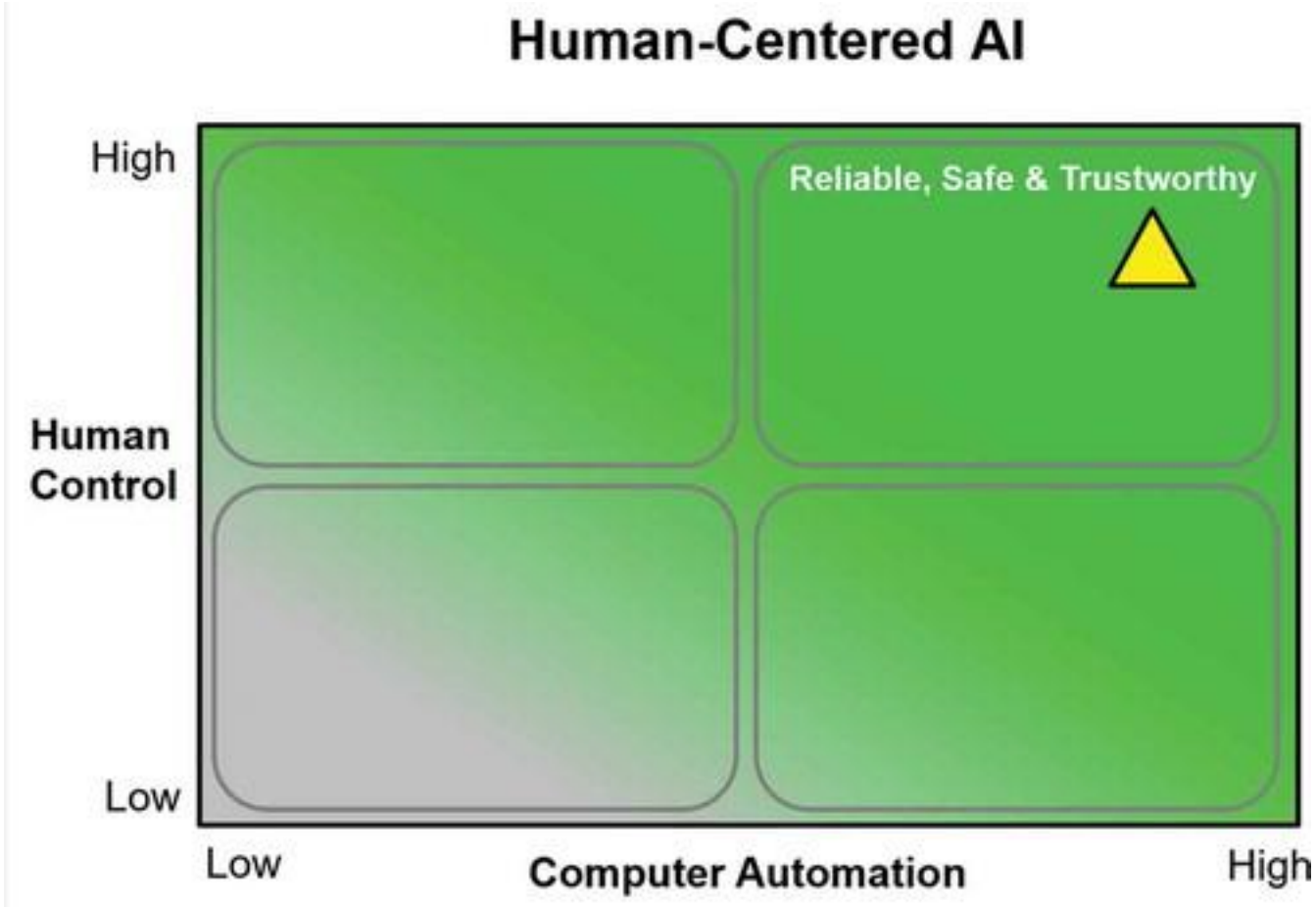
- Humans form part of an ecosystem and interact-collaborate with AI agents
- How should such interaction take place?
  - Human-only or autonomous agentic systems?
  - Complementarity, augmentation or substitution?
  - Individual or social?
  - Scripted or freeform?
- Our systematic literature review on Human-AI collaboration in Education shows a fuzzy and evolving landscape

# Autonomy vs automation
## Human-AI collaboration



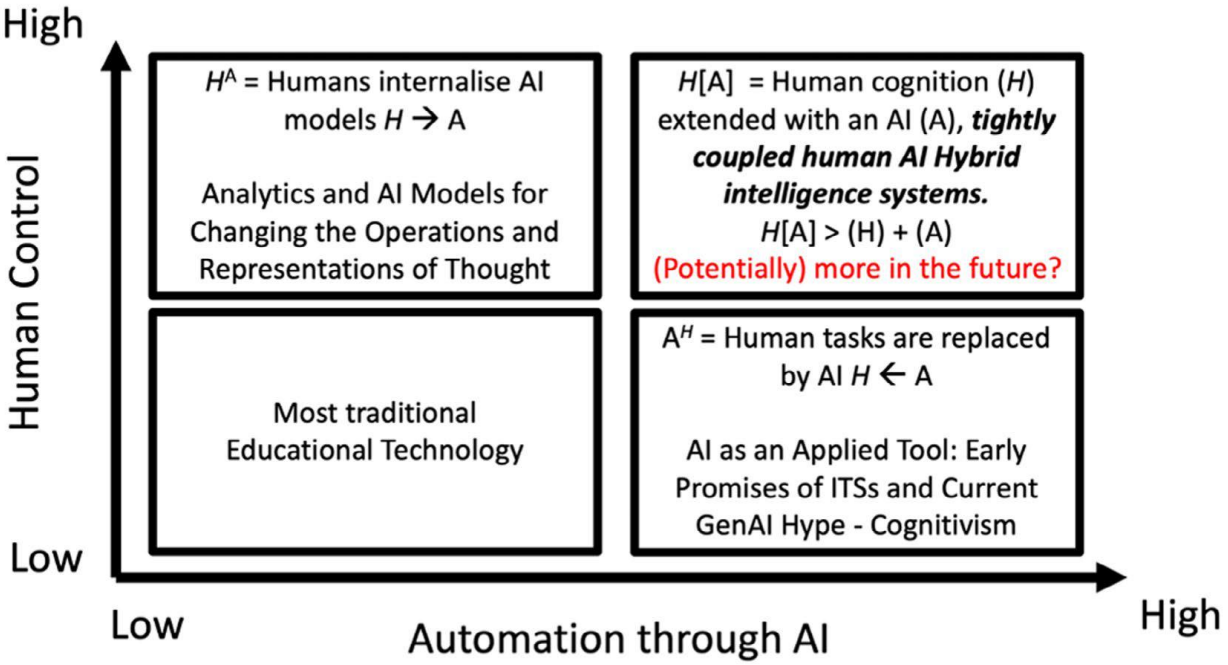

- Molenaar, I. (2021), "Personalisation of learning: Towards hybrid human-AI learning technologies", in *OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots*, OECD Publishing, Paris, https://doi.org/10.1787/2cc25e37-en.

# Autonomy vs automation
## Human-AI collaboration




Shneiderman, B. (2020). Human-Centered Artificial Intelligence: Reliable, Safe & Trustworthy. *International Journal of Human–Computer Interaction*, *36*(6), 495–504. https://doi.org/10.1080/10447318.2020.1741118

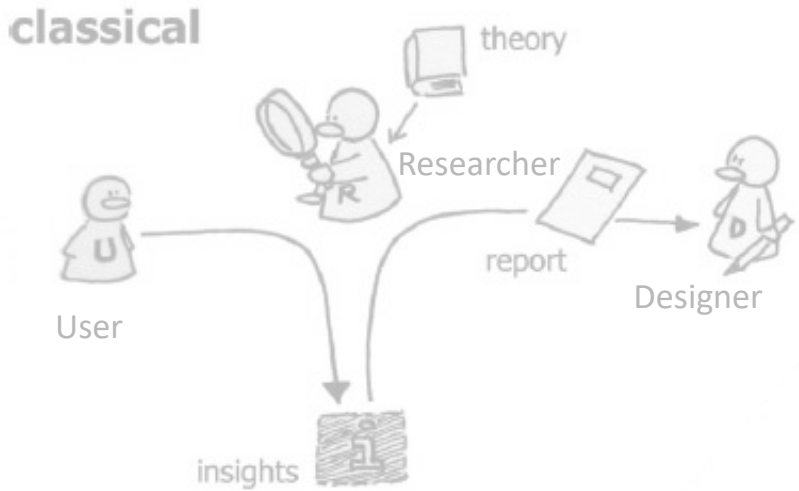
# Towards Human-AI Hybrid Intelligence




Cukurova, M. (2025). The interplay of learning, analytics and artificial intelligence in education: A vision for hybrid intelligence. *British Journal of Educational Technology*, *56*(2), 469-488.

# From User-Centered Design to Co-Design

## User-centred design




## Co-creation (co-design)


Sanders, E. B. N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *Co-design*, *4*(1), 5-18.

# Human-Centered Design

HCD should involve:

**Inclusion** via stakeholder participation in the design process

+

**Empathic experiences** (particularly when making design decisions).

Giacomin, J. (2014). What is human centred design? The Design Journal, 17(4), 606–623. https://doi.org/10.2752/175630614X140561854801.

# Human-Centered Design
## Some features

- Human centeredness is characterized by:
  - identifying the critical stakeholders
  - their relationships
  - the contexts in which those systems will function
- Bring humans in the design loop
- Enable humans (and societies) to
  - **understand and control** operations
  - ask for **responsibility/accountability**
  - bring in their **values**
  - decide on **ethical issues**

# Value-sensitive Design (I)

Values are essential for civil democratic societies, ethics, technology and education

Received: 23 April 2025 | Accepted: 23 April 2025

DOI: 10.1111/bjet.13602

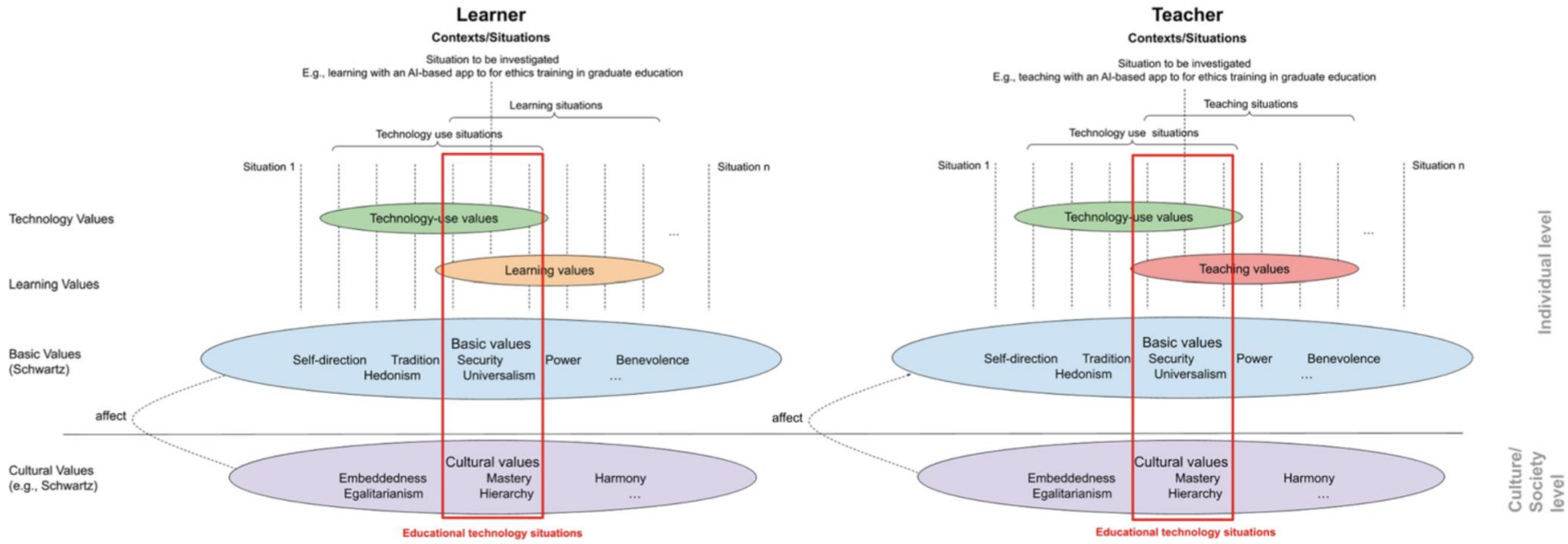
EDITORIAL

British Journal of Educational Technology BERA

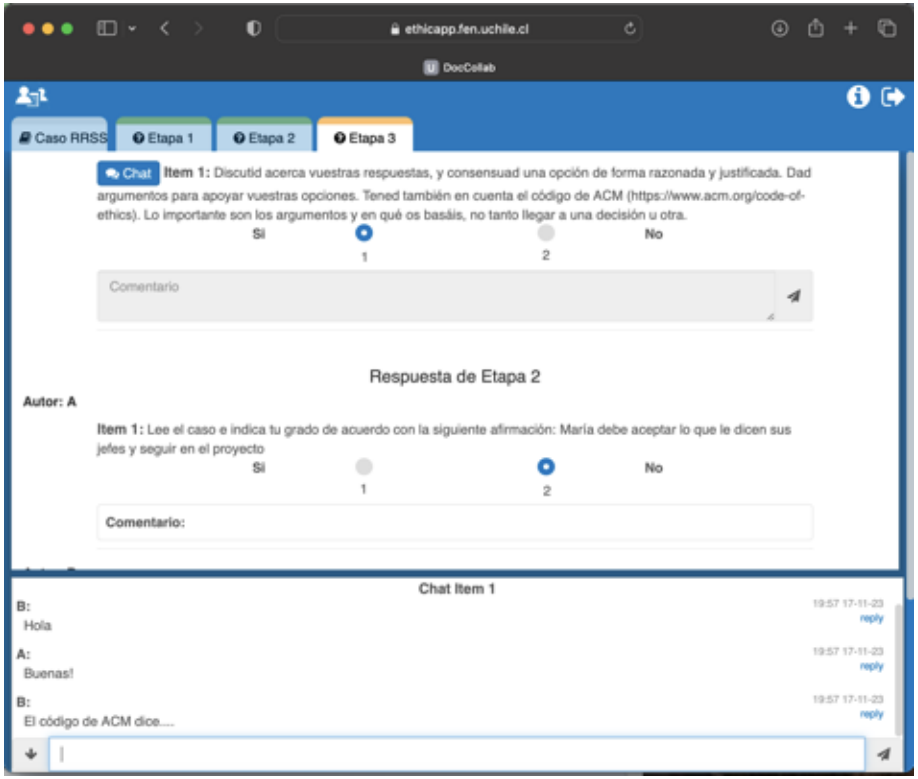
## Aligning human values and educational technologies with value-sensitive design

# Value-sensitive Design (II)

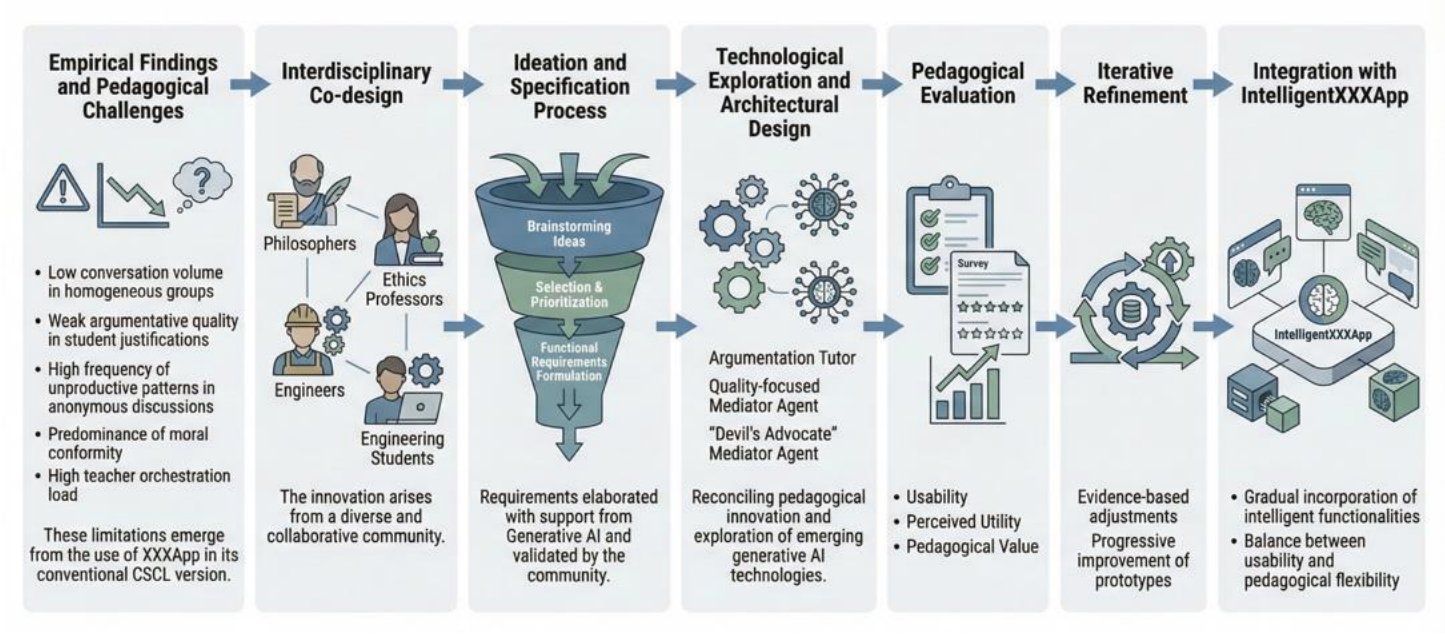
Cultural, Basic Human, Learning and Technology should be considered



# From *EthicApp*
## Education on Ethical Decision Making

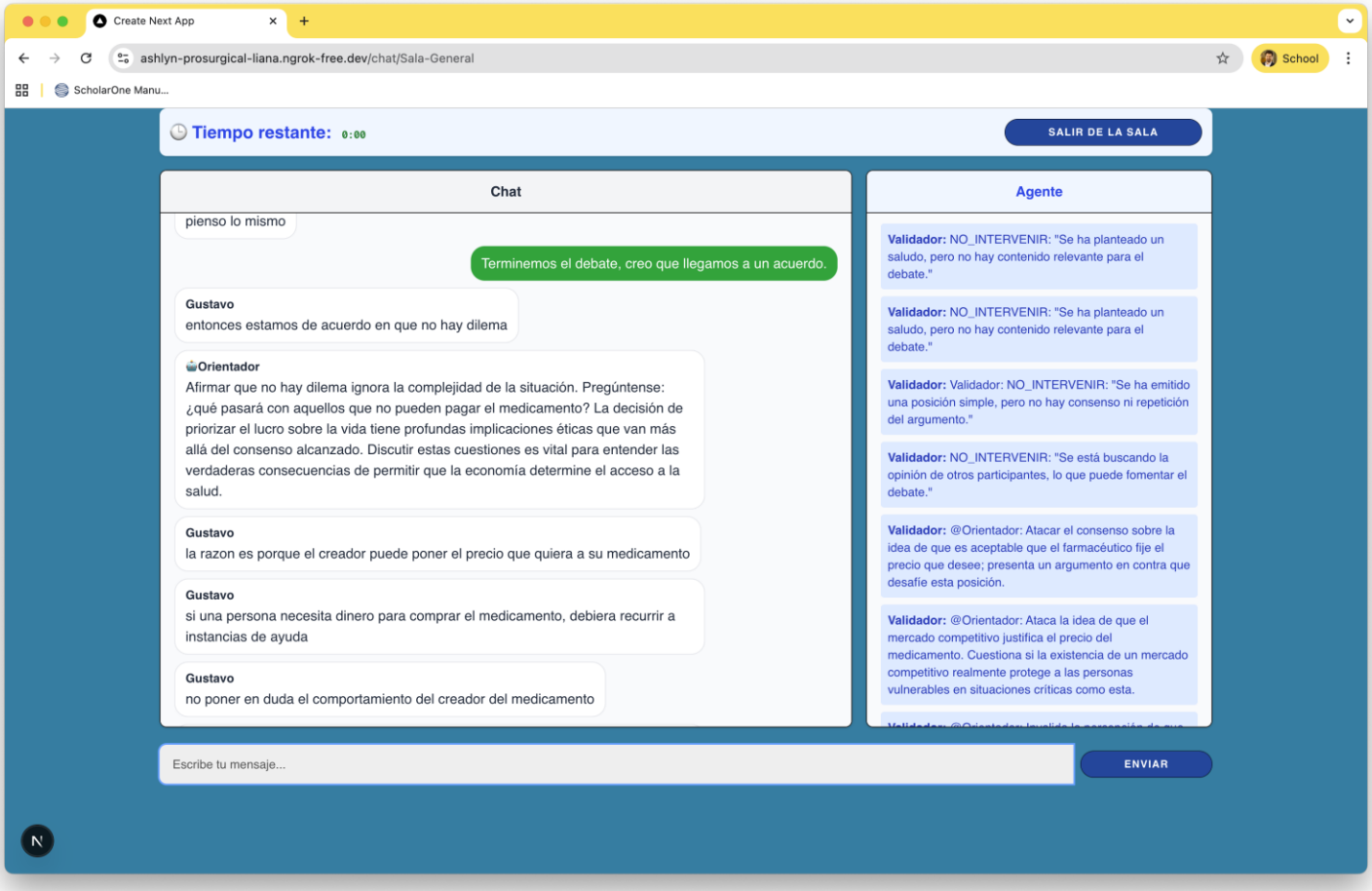



# To *Intelligent* EthicApp
## Human-Centered Value-Sensitive Design




Dimitriadis et al. “Towards a multi-agent Generative AI architecture to support ethics education: A human-centered design process”, Submitted to Tech-Edu 2026, Alexandroupolis, Greece, June 2026.

# To *Intelligent* EthicApp
## Discussion Mediating Multi-Agent System




Dimitriadis et al. “Towards a multi-agent Generative AI architecture to support ethics education: A human-centered design process”, Submitted to Tech-Edu 2026, Alexandroupolis, Greece, June 2026.

# DEMHAIC

Multimodal Human-AI Collaboration for Doctoral Education

UVa

Junta de Castilla y León

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MINISTERIO DE HACIENDA

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# Towards support to doctoral students' well-being and progress

- Involve learners in a participatory human-centered design approach
  - Questionnaires, interviews
- Align system features with value hierarchy (general, learning, technology)
- Extract design principles for LA/AI system
  - Deal with "fragmentation" and "loneliness"
  - Consider different "value personas", e.g., self-direction and autonomy

# Value-sensitive participatory design
## A structured approach

- Use a local securely stored and locally trained and fine-tuned LLM to support doctoral students
- Use a human-AI collaboration process to support all involved stakeholders (including teachers and researchers)

# What about feasibility / scalability?


## National Education Lab AI

NOLAI is the National Education Lab AI for elementary, secondary and special needs education in the Netherlands, funded by the National Growth Fund.

Our way of working is unique. Based on the latest questions in schools, we connect education, science and business in short-term projects. We develop evidence based prototypes and research the consequences of consciously and responsibly using AI in education.

# (Gen)AI(Ed): What should "we" do?

## Shift in Focus of Research

**Design of technologies for learning**

**Design of environments that allow general-purpose technologies to support the learning process**

*(even though technologies aim to support the production of artefacts)*

F. Pozzi, "Beyond the Algorithm: Participatory Approaches to the Use of AI to support Inclusive and Ethical Education", Keynote Talk, AIED 2025

# Final reflections

- Designing (Gen)AI(Ed) environments forms part of design for learning
- Multi-faceted problem on education, technology, society, ethics, values
- Look for human-centered, value sensitive and ethics by design approaches
- Solutions are very complex, and many dilemmas need to be answered