

Alessandra Pedone

Opacity and Subject Formation in AI-Mediated Adult Learning

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Panel M.11. Opacity, Subjectivity, and Pedagogy in Algorithmic Times

AI, Adult learning and the Right to Opacity



AI is reshaping not only how adults learn, but the conditions under which learning takes place.
(Selwyn et al 2025)



AI increasingly acts not only as a **learning tool**, but as a **cognitive-infrastructurel environment**.
(Ciasullo et al. 2026)



Personalisation, prediction and continuous datafication may expand access and individualise learning.
(Luckin & Holmes 2016; Cera 2024)



At the same time, algorithmic infrastructures increasingly collect, classify, predict and personalise learners' behaviours and trajectories (Cappelli & Rogovsky 2023).



Following **Édouard Glissant (1990)**, opacity can be understood as a **right not to be fully knowable**.



Research question:

Does AI-mediated training and learning expand educational inclusion, or does it reproduce inequalities while constraining learner autonomy?

From AI Transparency to the Opacity of the Subject

Two complementary ethical demands

AI systems should be transparent	Learners should retain opacity
Explainability	Non-exhaustive profiling
Accountability	Right not to be fully knowable
Visibility of purposes, limits and biases	Protection of unpredictability
Human oversight	Learner autonomy
Contestability of AI decisions	Freedom from excessive surveillance

Opacity = the right not to be fully knowable/profiled (Glissant 1990)

Agency = the capacity to act, question and resist algorithmic anticipation (Biesta 2010; Bandura 2001)

Transparency = an obligation concerning the AI system (Floridi 2022)

The paradox of AI-Mediated Adult Learning

Tension across different forms of AI-mediated adult learning

AI-mediated tool	Potentialities	Agency/Pedagogical risks
AI-enhanced LMS	Personalisation; progress monitoring; skills updating	Profiling; standardisation; algorithmic management
Learning Experience Platforms	Learner choice; microlearning; personalised recommendations	Fragmentation; excessive datafication; digital exclusion
AI-supported collaborative learning	Simulation; knowledge sharing; conversational agents	Individualisation; reduced collective dimension
AI-based HR tools	Skills analysis; career development; predictive learning	Black Box evaluation; surveillance; reduced autonomy

Ethical Risks in AI-Mediated Adult Learning

Data privacy and security: compliance with GDPR and transparency in the collection and use of learners' data.



Algorithmic bias: non-representative or historically biased datasets may reproduce or amplify existing inequalities in access, assessment, and educational opportunities.

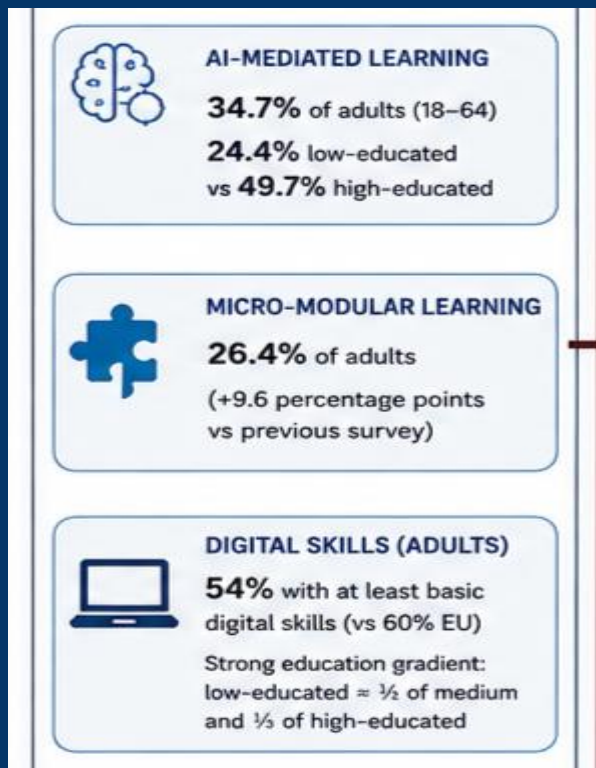


Black-box AI: complex algorithms and deep neural networks may produce decisions or recommendations that are difficult to interpret or explain. Limited interpretability can undermine **trust, accountability, and the justifiability of AI-mediated decisions**, particularly when they affect adults' educational and professional trajectories.



AI transparency concerns the system; opacity concerns the subject.

The Italian Context: Adult Training Participation and Digital Skills



The low-skilled
Paradox

AI-mediated learning
does not enter a
socially and
educational equal field.

Digital and educational
inequalities: Low-
educated and low-
skilled adults may have
fewer resources to
access, understand and
critically engage with
AI-mediated learning.

Source: INAPP Indaco Adulti 2025; DESI 2025.

AI reconfigures the roles of trainers and educators

AI increasingly supports or automates:

- Content generation and instructional design
- Personalised feedback and assessment
- Skills analysis and learning recommendations
- Monitoring of learning pathways

AI may reconfigure the educator's role from knowledge transmission towards facilitation, interpretation and critical pedagogical mediation.

Risk:

From pedagogical judgement → to the management of algorithmically organised learning

(Miao & Holmes 2023; Council of the EU 2026)

Conclusions

	Learners	Trainers / Educators
Opacity	A protected space of non-visibility, non-profiling and non-inference	A protected space for professional autonomy, pedagogical judgment
Subject formation	How AI profiling, classification, feedback, recommendation, influence learners as subjects	How AI contributes to reshaping teachers' professional roles and identities
Agency	The capacity to understand, negotiate, contest or refuse AI-generated classifications, recommendations and decisions.	The capacity to exercise professional judgment, pedagogical autonomy and responsibility in deciding how AI is used.
Key concern	Becoming too legible to the system: being reduced to data, profiles or predicted behaviours.	Becoming too governable by the system: having professional judgment increasingly standardised, monitored or displaced by AI.
Role of opacity	Opacity can create space for autonomy, experimentation	Opacity can preserve professional discretion and spaces of pedagogical judgment

(UNESCO 2025; Council of the EU 2026)

Conclusions

AI-mediated personalisation can expand educational inclusion by making skills, learning needs and skill gaps more visible and actionable.

Prerequisites for Inclusive AI-Mediated Learning:

- Digital capabilities → the ability to access and critically engage with AI
- Transparency of AI systems → explainability, accountability and human oversight
- Opacity of the learner → limits to algorithmic profiling, surveillance and behavioural prediction, protecting the learner's autonomy and capacity to remain more than what the system can infer.



*AI → datafication → increased legibility of the learner
tension with autonomy → right to opacity*

The challenge is to preserve the learner's capacity to remain partially unknowable to AI systems.

For trainers, the challenge is to preserve professional autonomy beyond what AI can measure, predict and standardise.

References

- Bandura A. (2001), Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1-26.
- Biesta G. (2010), *Good education in an age of measurement: Ethics, politics, democracy*. Boulder, CO: Paradigm Publishers.
- Cappelli P., & Rogovsky N. (2023), *Artificial intelligence in human resource management: A challenge for the human centred agenda?* ILO Working Paper 95. Geneva: ILO.
- Cera R. (2024), *Intelligenza artificiale ed educazione continua democratica degli adulti: personalizzazione, pluralismo e inclusione*. *Lifelong Lifewide Learning*, 22(45), 117–129.
- Ciasullo A., Santoianni F., & Manfredini A. (2026), Rethinking human agency in AI-mediated education. *Journal of Inclusive Methodology and Technology in Learning and Teaching*, 6(1).
- Council of the EU (2026), Council conclusions on teachers in the era of artificial intelligence, OJ C, C/2026/2826, 26.5.2026.
- Floridi L. (2022), *Etica dell'intelligenza artificiale. Sviluppi, opportunità, sfide*, Raffaello Cortina Editore, 2022
- Glissant É (1990), *Poétique de la Relation*. Paris: Gallimard.
- Luckin R. & Holmes W. (2016), *Intelligence Unleashed: An argument for AI in Education*.
- Miao F., Holmes W. (2023), Guidance for generative AI in education and research, UNESCO, <https://doi.org/10.54675/EWZM9535>.
- Pedone A. (2026), *Apprendere nell'era dell'Intelligenza Artificiale: potenzialità, sfide etiche e implicazioni per la formazione continua degli adulti*. *RESEARCH TRENDS IN HUMANITIES Education & Philosophy*, 13(1), 51–58.
DOI: <https://doi.org/10.6093/2284-0184/12927>
- Selwyn N. & Rivera-Vargas P. & Herrera Urizar G. (2025), Critical studies on education and technology: paths taken and futures imagined. *A Dialogue with Neil Selwyn*. *Izquierdas*. 54. 1-13. 10.4067/S0718-50492025000100248.
- UNESCO (2025), *Promoting and protecting teacher agency in the age of artificial intelligence*, International Task Force on Teachers for Education 2030, Position Paper, Paris, France: UNESCO.

Thank you

Alessandra Pedone

a.pedone@inapp.gov.it

Gruppo di Ricerca Formazione Continua e Apprendimento degli Adulti
Struttura Sistemi Formativi

