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ARTIFICIAL INTELLIGENCE IN CONTINUING TRAINING: REGULATION, ETHICS AND HUMAN-CENTRED APPROACHES IN EUROPEAN AND ITALIAN CONTEXTS

ESA Midterm Conference - Technology in the Face of Global Challenges
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AI and Organizational Transformation

EU and Italian Regulatory Frameworks (AI Act, Law 132/2025)

Algorithmic Management and Training Implications

Critical Challenges and Opportunities

Contextual Data

Methodological Framework & Research Grounding

Contributions to Sociology of Science and Technology

Conclusions

AI & Organizational Transformation

AI deployment in public and private organizations:

- Beyond efficiency tools: produces deep transformations in work and competency distribution
- Redefines professional requirements and organizational dynamics continuously
- Continuing training becomes strategic mediator of technological innovation impact
- Requires governance frameworks balancing innovation with worker protection

Regulatory Framework: EU & Italy

- **EU AI Act (2024/1689):** AI in education/training = high-risk; transparency, human oversight, AI literacy mandatory
- **Ban on high-risk practices (Feb 2025):** Emotional recognition AI in workplace/education prohibited; systems for worker mood monitoring forbidden
- **Italy Law 132/2025:** AI alphabetization requirements, Observatory on AI in work, digital rights protection
- **Key requirement:** Organizations must inform and train employees on AI systems affecting their work

Guidelines for the Implementation of AI in the World of Work

The Italian Ministry of Labor and Social Policies, in collaboration with other government bodies, has developed comprehensive guidelines and conducted a public consultation to support the ethical, safe, and human-centered implementation of Artificial Intelligence in the world of work and an Observatory on the Adoption of AI in the World of Work (established by Law 132/2025 and already operational).

- **Ethical Foundation: Transparency, human oversight, and protection against algorithmic discrimination**
- **Practical Tools: Checklists, templates, audit frameworks, and training toolkits for responsible adoption**
- **Governance: Participatory models with workers' representatives and dedicated AI ethics committees**
- **Skills & Training: Modular, accessible, continuous education to bridge digital gaps and prepare workers**
- **Financial Support: Vouchers, pilot funding, and public-private partnerships for companies and workers**
- **Legal Compliance: Alignment with EU AI Act and GDPR requirements**
- **Monitoring: National observatory to track implementation effects and update guidelines**
- **Implementation Strategy: Structured processes (needs assessment → deployment) with risk-aware, inclusive approach**

Strategic Vision: Foster innovation and competitiveness while safeguarding rights, enabling lifelong learning, and advancing European digital transition goals

Regulatory Framework: AI Act

Article	Provision	Description	Examples/Implications
Art. 5	Prohibitions relating to certain AI practices	Prohibits the use of AI systems for emotion recognition (inference of emotions) in workplaces and educational institutions	Prohibition: AI tools that scan faces of students and/or workers during tests to detect stress or fear, used to evaluate attention levels. Exceptions: Medical or safety purposes.
Art. 4	Requirements regarding AI Literacy	Obligation to guarantee an adequate level of AI literacy for personnel involved in using AI systems	Application: Applies to all AI systems, not only prohibited or high-risk ones. Requirements for organizations: Active promotion of skills and knowledge among staff. Literacy level proportional to the context and people potentially affected by the system.

AI-Integrated Continuing Training Tools. Potentials and Challenges

Tool	Description	Potential Benefits	Key Challenges
LMS with AI	Platforms managing and delivering corporate training	Personalized tutoring, progress monitoring, skill updates	Top-down approach, risk of over-standardization, algorithmic management issues
Learning Experience Platforms	Platforms enabling personalized and informal learning	Learner autonomy, multimedia content, personalized recommendations	Learning fragmentation, alignment with company goals, accessibility for low-skilled users
AI Collaborative Learning	Platforms supporting interaction between learners and AI	Realistic simulations, knowledge sharing, innovative learning	Focus on individual learning limits collective engagement, need critical evaluation
AI-based HR Tools	AI applications for workforce skill development	Personalized learning, training needs prediction, professional growth integration	Limited research, invasive management risks, transparency of decisions

Continuing Training and Algorithmic Management

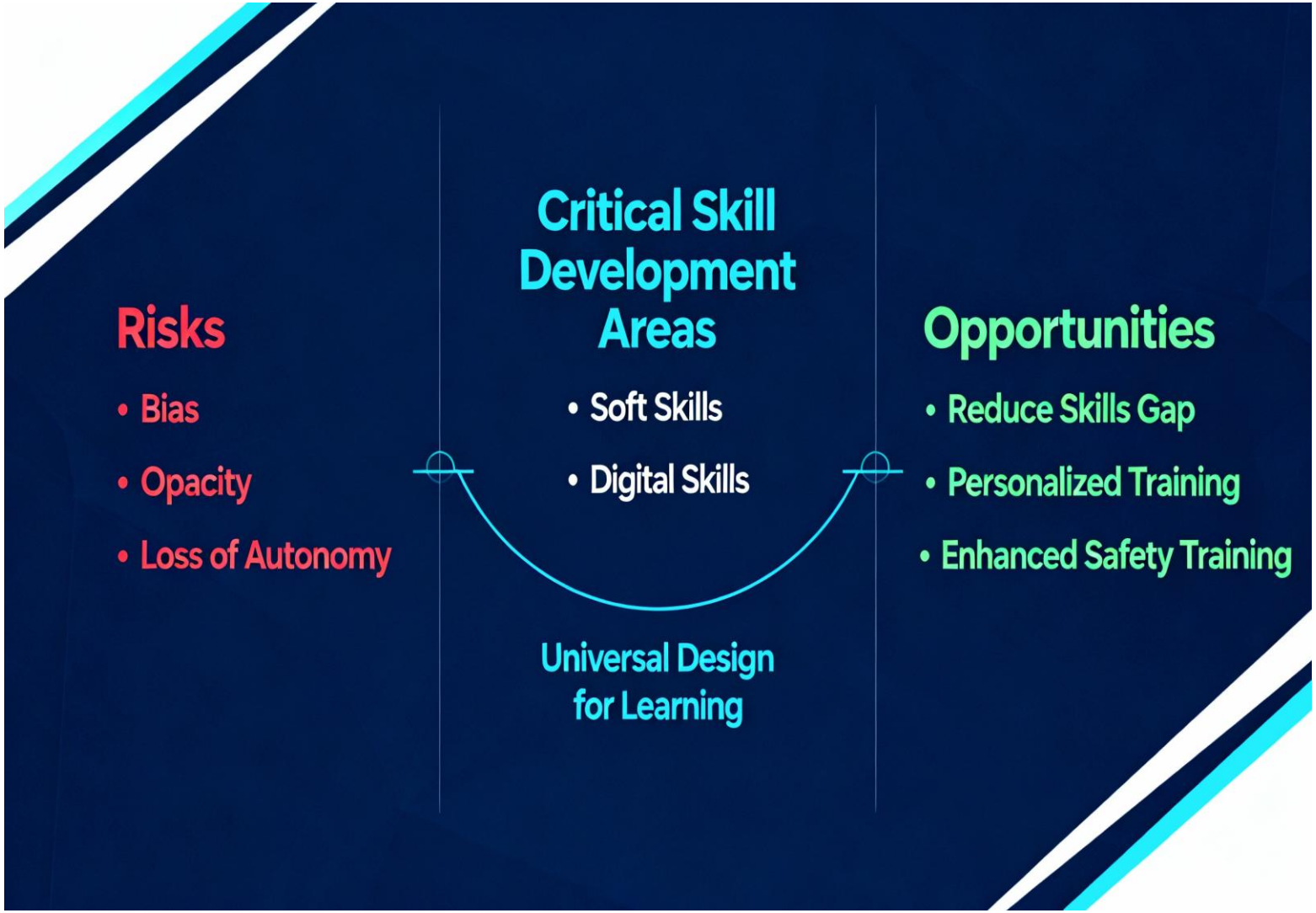
The diffusion of AI in organizational contexts extends far beyond operational efficiency tools. Continuing training has become a critical institution where algorithmic management systems operate on two interconnected levels:

- **As a Governance Mechanism**: Algorithms assess skill gaps, evaluate training, allocate resources, monitor completion.

- **As Training Delivery & Tutoring**: LMS with AI-driven personalization, virtual tutors providing adaptive instruction, intelligent recommendation engines suggesting learning modules, and automated assessments evaluating learning outcomes. Workers interact directly with AI systems that shape their learning experience, engagement, and skill recognition.

Continuing Training and Algorithmic Management

Challenges and opportunities



Methodological Framework & Research Grounding

This contribution is based on preliminary findings from an INAPP Research Project (Desk Analysis Phase) and related ongoing studies on AI's impact in continuing training.

- Desk Research: Policy documents, regulations, academic literature on AI ethics, pedagogy, and democratic adult education
- Empirical Data: Eurostat and Istat data on AI adoption in SMEs, Inapp Report on Continuing Training in Italy

Interdisciplinary Grounding - Integrating theoretical debates with real-world practices across:

- Ethical frameworks for AI in VET
- Democratic governance of adult learning

The field research phase (case studies, interviews, focus groups) is ongoing.

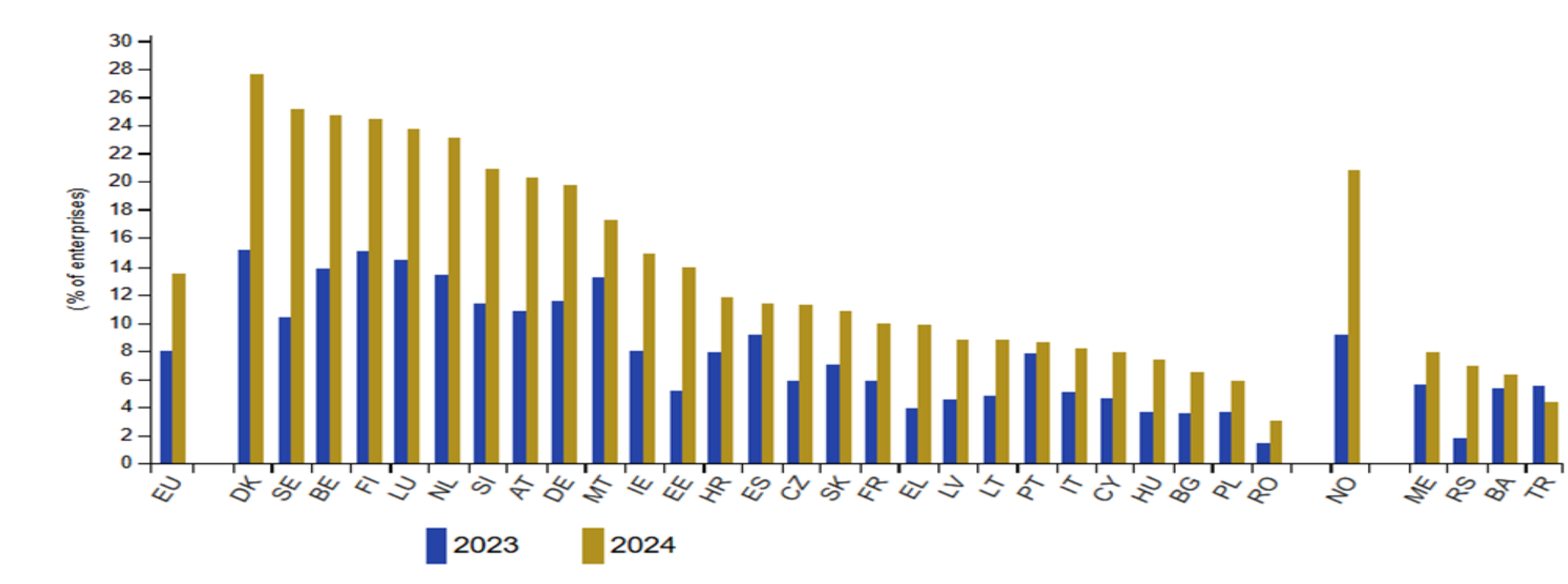
Contextual Data

Basic digital skills, by level of education, 2023 (% age group 16–74)

	All	low	medium	high
EU	55,35	33,71	51,03	79,63
Italy	45,75	22,57	52,59	74,09

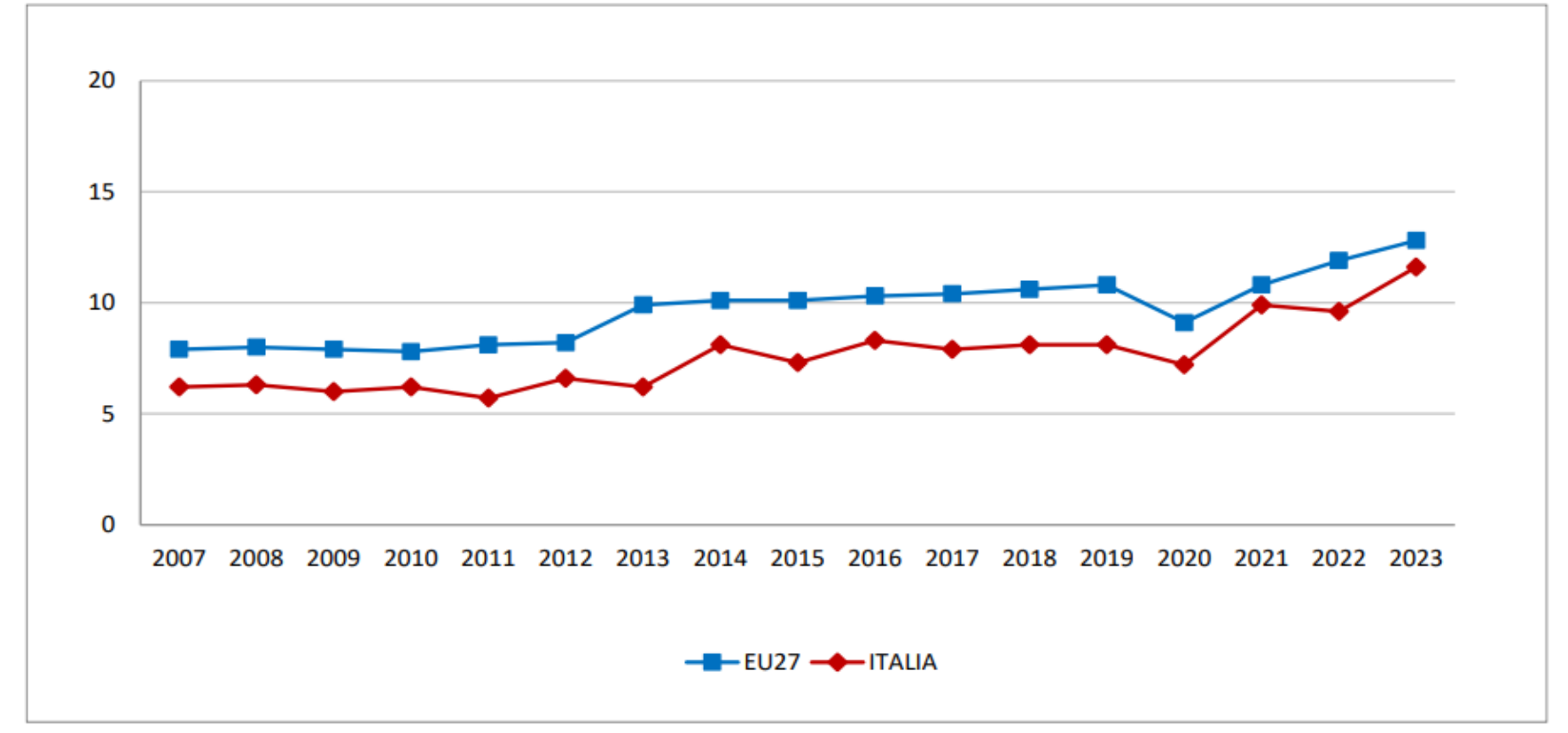
Source: Eurostat (online data code: isoc_sk_dskl_i21)

Enterprises using AI technologies, 2023 and 2024



Source: Eurostat (online data code: isoc_eb_ai)

Participation rate of the population aged 25-64 in education and training activities (4 weeks, %)

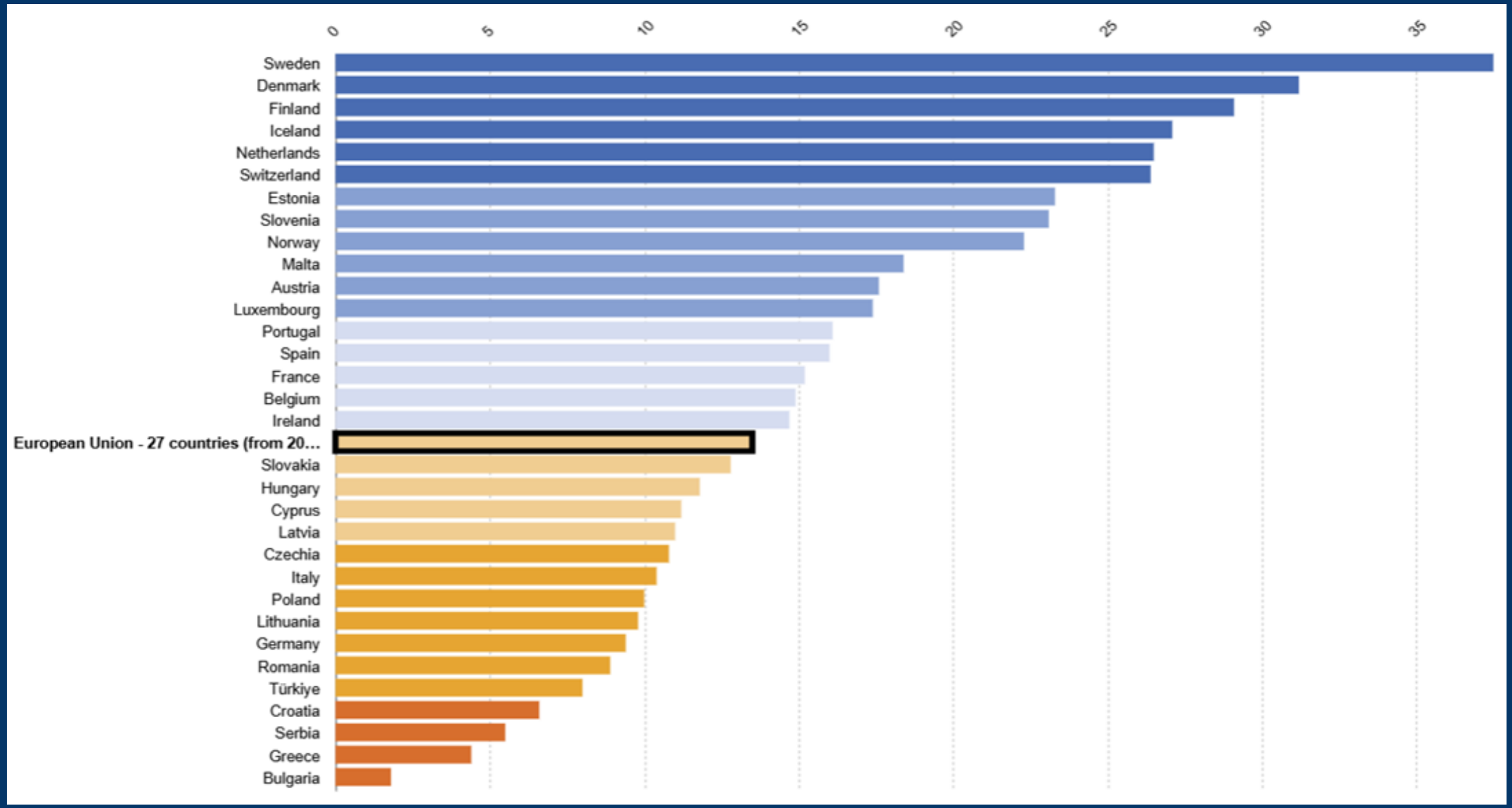


ITALY 11.6% in 2023

EU 12.8%

Source: Eurostat, LFS

Participation rate of the population aged 25-64 in education and training activities (4 weeks, %) 2024



ITALY 10.4%

EU 13.5%

Source: Eurostat, LFS

INAPP Research Project

Industry 4.0: Digital Transition Effects on Italian SMEs and Continuing Training Policies

Focus: The strategic role of Competence Centers and European Digital Innovation Hubs (EDIH) in supporting technological transformation and training policy evolution

Research Scope:

- AI adoption in Italian SMEs (HR dimension)
- Workforce competency transformation
- Continuing training policy gaps

Stakeholders:

- SMEs enterprises
- Competence Centers & EDIH
- Policy makers & social partners

Contributions to Sociology of Science and Technology

Algorithmic management is now shaping work organization, training practices, and professional development in European workplaces. (Milanez et al., 2025; Baiocco et al., 2022).

AI’s rise in HR and training systems creates opportunities but also new challenges for worker autonomy, dignity, and equitable access. (Cappelli & Rogovsky, 2023).

Recent evidence (OECD, JRC, ILO, EU Commission) confirms that governance of AI in education and training is a matter of deliberate social and political choice, not only technical inevitability.

Conclusions

Key literature findings

While AI holds potential to enhance motivation, skills-matching, and flexibility in adult learning (EAEA, 2025), persistent divides remain for low-skilled adults and disadvantaged regions (OECD, 2024).

Grounded in sociological debates (Butera & De Michelis, 2024; Law & McCall, 2024), recent research advocates for human-centred AI literacy (Laupichler et al., 2022).

A new concept of "algorithmic citizenship" (Boriati & D'Ambrosio, 2025), a socio-educational framework that positions critical digital competence as essential for active civic participation and advancing social inclusion.

Conclusions

AI in continuing training is not a neutral technical tool but an active governance mechanism that reshapes worker agency, competency recognition, and labour relations.

Continuing training need human-centred development through strong governance, participation, and rights safeguards.

CVET empower workers to understand, participate, contest, and benefit equitably from AI-based training
(soft skills + digital skills)

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