

The Italian Alliance for AI Literacy Building National Capacity through a Federated Community-of-Practice Model

Giovanni Adorni^{1,*†}, Emanuele Bellini^{2†}, Carla Limongelli^{3†}, Andrea Orlandini^{4†},
Piero Poccianti^{5†}, Gianluca Simonetta^{6†}, Angela Maria Sugliano^{7†} and Davide Taibi^{8†}

¹DIBRIS, University of Genoa, Viale Francesco Causa 13, 16145 Genoa, Italy

²DSU, University of Roma Tre, Rome, Via Ostiense, 234, 00146 Rome, Italy

³DICITA, University of Roma Tre, Via V. Volterra, 62, 00146 Rome, Italy

⁴ISTC, National Research Council of Italy, Via Gian Domenico Romagnosi, 18a, 00196 Rome, Italy

⁵AIxIA, c/o ISTC, National Research Council of Italy, Via Gian Domenico Romagnosi, 18a, 00196 Rome, Italy

⁶DILEF Università di Firenze, Via della Pergola, 60, 50121 Firenze, Italy

⁷ASSO EPICT Italia ETS, Piazza De Marini, 24, 16123, Genoa, Italy

⁸ITD, National Research Council of Italy, Via Ugo La Malfa, 153, 90146 Palermo, Italy

Abstract

Artificial Intelligence is reshaping education, work, and society, making AI literacy a strategic priority for educational systems. In Italy, a growing number of public institutions, universities, research organisations, professional communities, and educational networks already contribute to AI education. However, these initiatives remain distributed, and the knowledge, practices, and relationships they generate are not always sufficiently connected or sustained over time.

Rather than proposing a new AI-literacy framework, this conceptual design study addresses this connective gap by proposing the *Italian Alliance for AI Literacy* as a lightweight organisational layer within the broader *National AI Literacy Ecosystem*. The Alliance adopts a federated Community-of-Practice model to connect autonomous actors and communities while preserving their responsibilities and institutional diversity.

The model draws on international AI-literacy frameworks, Digital Humanism, Cyber Humanities, Communities of Practice, and an illustrative mapping of European and Italian initiatives. From this synthesis, four analytical dimensions—*People, Knowledge, Society, and Governance*—provide a common language for mapping contributions, identifying complementarities and gaps, and supporting collaboration. These dimensions are combined with four enabling functions, lightweight distributed-governance principles, and a non-prescriptive staged pathway including a six-month pilot for examining feasibility, participation, and connective value.

The contribution is therefore a progressively operationalisable model enabling distributed AI-literacy initiatives to contribute to a shared, human-centred AI culture and collective AI-education capability.

Keywords

AI Culture, AI Literacy, AI Education, Communities of Practice, Capacity Building, Teacher Professional Development, Digital Humanism, Cyber Humanities

1. Exploring the Need for a National Alliance for AI Literacy

Artificial Intelligence (AI), and particularly Generative AI, is rapidly transforming education, work, and society. AI systems are increasingly embedded in teaching, learning, assessment, and lifelong education, making AI literacy—and, more broadly, the development of a shared, human-centred AI culture—a

AI-LEAP 2026: 1st International Workshop on AI Learning, Education And Practice, co-located with AIxIA 2026, University of Perugia, October 2026

*Corresponding author.

†These authors contributed equally.

✉ giovanni.adorni@unige.it (G. Adorni); emanuele.bellini@uniroma3.it (E. Bellini); carla.limongelli@uniroma3.it

(C. Limongelli); andrea.orlandini@istc.cnr.it (A. Orlandini); piero.poccianti@gmail.com (P. Poccianti);

gianluca.simonetta@unifi.it (G. Simonetta); am.sugliano@assoepict.it (A.M. Sugliano); davide.taibi@itd.cnr.it (D. Taibi)

0000-0003-3933-4377 (G. Adorni); 0000-0002-7878-8710 (E. Bellini); 0000-0002-0323-7738 (C. Limongelli);

0000-0001-6458-5202 (A. Orlandini); 0000-0001-5427-8874 (G. Simonetta); 0009-0001-0498-8875 (A.M. Sugliano);

0000-0002-0785-6771 (D. Taibi)



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strategic priority [1]. International frameworks increasingly reflect this shift: DigComp 3.0 incorporates AI as a transversal dimension of digital competence [2]; UNESCO's AI Competency Framework for Teachers defines the knowledge, skills, and values required for responsible educational integration [3]; and the OECD Teaching Compass emphasises teacher agency, collaborative professional learning, and innovation-supporting educational ecosystems [4]. Together, these perspectives frame AI integration as an educational, organisational, and cultural transformation rather than merely a technological one [5].

In Italy, this transformation is already reflected in a growing range of public, academic, professional, and educational initiatives. The Ministry of Education and Merit has introduced national guidelines, AI-related services within the UNICA platform, and resources for school-based professional development [6, 7]. Professional communities have developed complementary approaches, including the Artificial Intelligence Syllabus promoted by the Italian EPICT community [8, 9]. Together with universities, research centres, scientific societies, school networks, and other organisations, these developments indicate that a *National AI Literacy Ecosystem* already exists.

The problem addressed by this paper is therefore not the absence of initiatives, but their distributed and only partially connected character. Knowledge may remain embedded in individual projects, relationships created through temporary initiatives may weaken when those initiatives end, and institutional guidelines may not easily translate into shared educational practice. The resulting gap is primarily connective: how can autonomous actors, resources, experiences, and professional communities become mutually visible and contribute to collective learning without being centralised or standardised?

To address this gap, the paper proposes the *Italian Alliance for AI Literacy*¹. The Alliance is conceived as a lightweight connective organisational layer within the broader *National AI Literacy Ecosystem*, adopting a federated Community-of-Practice model to connect autonomous actors and communities while preserving their responsibilities and institutional diversity. Its novelty lies not in introducing a new AI-literacy framework, educational programme, or central coordinating body, but in providing a federated organisational model through which existing competences, experiences, resources, and relationships can contribute to a shared, human-centred AI culture and collective AI-education capability.

The proposal is grounded in Digital Humanism and Cyber Humanities, which provide its human-centred and epistemic orientation [10, 11], and in Communities of Practice as a basis for sustained collaborative learning. Its lightweight character rests on voluntary participation, limited facilitation, proportionate commitments, and the use of existing institutional and community capacities.

Methodologically, the paper adopts a conceptual design approach. It draws on international AI-literacy frameworks and an illustrative mapping of selected European and Italian initiatives, considered in terms of their role, target groups, organisational level, and type of contribution. An interpretive synthesis of these sources informs four analytical dimensions—*People, Knowledge, Society, and Governance*—which provide a common language for describing contributions, identifying complementarities and gaps, and supporting connections across the ecosystem.

The resulting model combines these four dimensions with four enabling functions, lightweight principles for distributed governance, and a non-prescriptive staged pathway for progressive operationalisation, including a proposed six-month pilot. The model is intended as an explicit but revisable basis for stakeholder discussion and limited experimentation, rather than as a predetermined institutional structure.

2. From Individual AI Literacy to Collective Capability

AI literacy has expanded beyond basic AI concepts and applications to include critical judgement, ethical awareness, responsible human–AI collaboration, and the ability to act knowledgeably in AI-mediated environments. Competence frameworks define relevant learning outcomes, but do not by themselves explain how competences can remain current, become embedded in institutional practice, and evolve as technologies and educational contexts change. This requires enduring processes through

¹The term *Alliance* denotes a voluntary coalition of autonomous institutions oriented towards a shared vision and collaborative action while preserving institutional diversity, independence, and responsibility.

which emerging opportunities, risks, and practices can be interpreted and translated into responsible educational action.

In this paper, *AI culture* refers to the shared understandings, values, criteria, and practices through which educational communities interpret and respond to Artificial Intelligence. Whereas AI literacy concerns primarily what individuals know and can do, AI culture concerns how those competences are exercised, questioned, renewed, and connected to collective educational purposes [12, 5]. Developing such a culture therefore requires experiences and practices to be made explicit, compared across contexts, and discussed through shared languages and criteria, so that they can become interpretable and reusable without requiring uniform replication.

Capacity building denotes the cumulative process through which this collective learning develops enduring educational and institutional capability. It extends beyond training provision to support the generation, validation, circulation, and progressive refinement of knowledge, resources, and practices.

Communities of Practice provide an established organisational basis for this process [13]. They are characterised by sustained engagement around a shared domain, interaction among participants, and the progressive development of a shared repertoire of knowledge and practice. They therefore differ from broader stakeholder networks or temporary forms of coordination. AI education, however, involves multiple communities with different mandates, disciplinary languages, and institutional contexts. A national model must connect them without absorbing them into a uniform structure.

This configuration is consistent with a *landscape of practice*, in which distinct communities retain their identities while developing boundary connections and shared forms of knowledgeability [14]. It provides the theoretical basis for the federated Community-of-Practice model adopted by the proposed Alliance: distinct communities remain autonomous, while the Alliance supports connections through which individual AI-literacy competences and distributed experience can contribute to shared AI culture and collective AI-education capability.

3. Principles for a Human-Centred AI Culture

The collective process outlined in Section 2 requires a normative and epistemic orientation. The proposed Alliance would therefore be guided by shared human-centred principles while allowing participating organisations to retain their educational approaches, responsibilities, and areas of expertise.

Digital Humanism provides the normative foundation of this orientation. It understands Artificial Intelligence as part of a socio-technical transformation that should remain aligned with human dignity, inclusion, agency, democratic participation, and social responsibility [10]. The educational value of AI therefore depends not only on technological performance, but also on the purposes, arrangements, and forms of accountability through which it is adopted.

This orientation is consistent with the European AI Act and the Italian Ministry of Education and Merit's *Guidelines for the Introduction of Artificial Intelligence in Schools*, which emphasise fundamental rights, human oversight, and responsibility [15, 6]. These principles provide an institutional context for responsible collaboration without prescribing a single educational model.

Cyber Humanities complements this foundation by focusing on the transformation of knowledge practices. It interprets AI as part of the cognitive infrastructure through which knowledge is produced, communicated, interpreted, and validated [11]. As generative and agentic systems participate in reasoning, writing, information retrieval, problem formulation, creativity, and decision support, they influence how individuals and communities construct meaning, assess evidence, and establish reliable knowledge.

This transformation requires *epistemic agency*: the ability to examine AI-generated content critically, recognise uncertainty and limitations, decide which cognitive tasks may appropriately be delegated, and remain accountable for resulting claims and decisions. Epistemic agency connects responsible AI use with the preservation of human judgement and awareness of how human–AI interaction reshapes knowledge production.

Digital Humanism and Cyber Humanities thus provide complementary foundations for a shared

AI culture: the former establishes its human-centred and socially responsible orientation, while the latter addresses the changing relationship between artificial systems and knowledge. Together, they offer a common reference through which participating communities can interpret change, compare experiences, and discuss educational implications.

These principles constitute a shared cultural orientation rather than a requirement for uniform methods, institutional arrangements, or technological solutions. Their interpretation may be progressively discussed and refined through stakeholder participation as the Alliance develops.

4. Mapping the AI-Education Landscape

To make the organisational basis of the proposed model more explicit, this section provides an illustrative mapping of selected European, international, and Italian initiatives. The mapping is not intended as a systematic or exhaustive review; rather, it highlights recurring differences in target groups, organisational level, and type of contribution. These characteristics are then related to the four analytical dimensions introduced in Section 5: *People* (P), *Knowledge* (K), *Society* (S), and *Governance* (G).

Table 1 summarises representative initiatives. Multiple dimensions may apply to the same initiative; the mapping is interpretive and indicates its main contributions rather than assigning exclusive categories.

Table 1

Illustrative mapping of selected AI-literacy and AI-education initiatives. P = People; K = Knowledge; S = Society; G = Governance.

Initiative	Scope / target	Main contribution	Dim.
AILit Framework [16]	International; primary and secondary education	Competence and policy orientation for AI literacy, with educational examples	P,K,G
AI4K12 [17]	International; K–12 learners and educators	Curricular guidance and conceptual foundations for AI education	P,K
KI-Campus [18]	National/open; learners and professionals	Open learning resources, thematic communities, and expert exchange	P,K
AI-DL [19]	European; teachers and schools	Data and AI literacy through transnational Communities of Practice	P,K,G
MIM initiatives [6, 7]	National; schools and educators	Policy guidance, digital services, and professional-development support	P,K,G
INDIRE initiatives [20, 21]	National; schools, including small and disadvantaged contexts	Research, experimentation, professional learning, and networking across different educational contexts	P,K,S,G
Edvance [22]	National; education and professional learning	Digital resources, innovation projects, and capacity-building infrastructure	P,K,G
AI4S [23]	National; schools and educational institutions	Collaborative experimentation on AI curricula involving universities and school networks	P,K,G
EPICT AI Syllabus [8, 9]	National; educators and teacher educators	Pedagogically informed AI integration, professional learning, and certification pathways	P,K

4.1. Complementary Functions in the AI-Education Landscape

The initiatives in Table 1 illustrate several complementary functions. Frameworks such as AILit establish competence expectations and policy orientations [16], while AI4K12 provides curricular guidance for primary and secondary AI education through grade-band progressions organised around five core ideas: perception, representation and reasoning, learning, natural interaction, and societal impact [17].

Open platforms such as KI-Campus broaden access to learning resources and professional exchange [18], whereas projects such as AI-DL combine competence development with collaborative learning through Communities of Practice [19].

These examples show that AI education depends on different forms of contribution rather than on a single organisational model. Their value for collective capability therefore depends not only on what individual initiatives produce, but also on whether their resources, experiences, and professional relationships can remain visible, interpretable, and connected across institutional boundaries.

4.2. The Italian National AI Literacy Ecosystem

The Italian landscape illustrates the same diversity at national level. Public institutions contribute policy guidance, services, and professional development; universities and research bodies support research and experimentation; scientific and professional communities contribute disciplinary expertise, pedagogical models, and professional learning; and school networks provide contexts for situated experimentation.

INDIRE offers a particularly illustrative example. Its activities combine research and teacher development with experimentation in different school contexts, including geographically isolated and disadvantaged settings [20], while its thematic networks connect local experiences from *Avanguardia Educative* and *Piccole Scuole* [21]. This combination contributes simultaneously to the *People*, *Knowledge*, *Society*, and *Governance* dimensions.

A second example is AI4S, promoted by DiSAL and scientifically coordinated by the University of Bologna and its *MOdE-Museo Officina dell'Educazione*. By connecting schools, a school-leadership association, and a university around experimentation with an AI curriculum, it combines professional development, knowledge production, and cross-organisational collaboration [23]. Other actors, including AIxIA, the CINI Cyber Humanities Working Group, EPICT, Edvance, and professional associations, provide complementary scientific, human-centred, pedagogical, and organisational contributions [24, 25, 8, 22].

Taken together, these examples show that a *National AI Literacy Ecosystem* already exists as a distributed constellation of autonomous actors, competences, resources, communities, and institutional relationships. The gap addressed by the proposed Alliance is therefore connective rather than substantive: its purpose is not to replace or standardise existing initiatives, but to make their contributions more visible, interpretable, and capable of entering into sustained collaborative relationships.

5. A Four-Dimensional Model for a National AI Literacy Ecosystem

The preceding mapping shows that the *National AI Literacy Ecosystem* already comprises an evolving constellation of autonomous actors, initiatives, resources, practices, and institutional relationships. Drawing on the descriptive criteria used in Table 1 and the theoretical perspectives developed in Sections 2 and 3, recurring types of contribution were organised into four analytical dimensions: *People*, *Knowledge*, *Society*, and *Governance*. These dimensions constitute an interpretive synthesis rather than an empirically validated taxonomy.

More specifically, contributions concerning competences, professional roles, and participation are associated with *People*; resources, evidence, and knowledge-sharing processes with *Knowledge*; inclusion, equity, and societal implications with *Society*; and policies, institutional responsibilities, coordination, and sustainability with *Governance*. Initiatives may contribute to several dimensions simultaneously.

As shown in Fig. 1 on the following page, these four dimensions are interdependent within the *National AI Literacy Ecosystem*. The *Italian Alliance for AI Literacy* is represented separately as a lightweight connective organisational layer adopting a federated Community-of-Practice model.

The *People* dimension concerns the actors and capabilities through which AI education develops, including learners, educators, researchers, institutional leaders, professional communities, AI literacy, agency, and professional expertise.

The *Knowledge* dimension concerns the production, documentation, validation, circulation, and adaptation of educational knowledge, including frameworks, research findings, resources, guidelines, practices, and evidence.

The *Society* dimension concerns the relationship between AI education and wider cultural, ethical, and social contexts, including inclusion, educational equity, citizenship, stakeholder participation,

territorial diversity, bias, and unequal access to AI.

The *Governance* dimension concerns the institutional and regulatory conditions that shape AI education, including policies, public strategies, funding, institutional responsibilities, quality and accountability mechanisms, coordination, and sustainability.

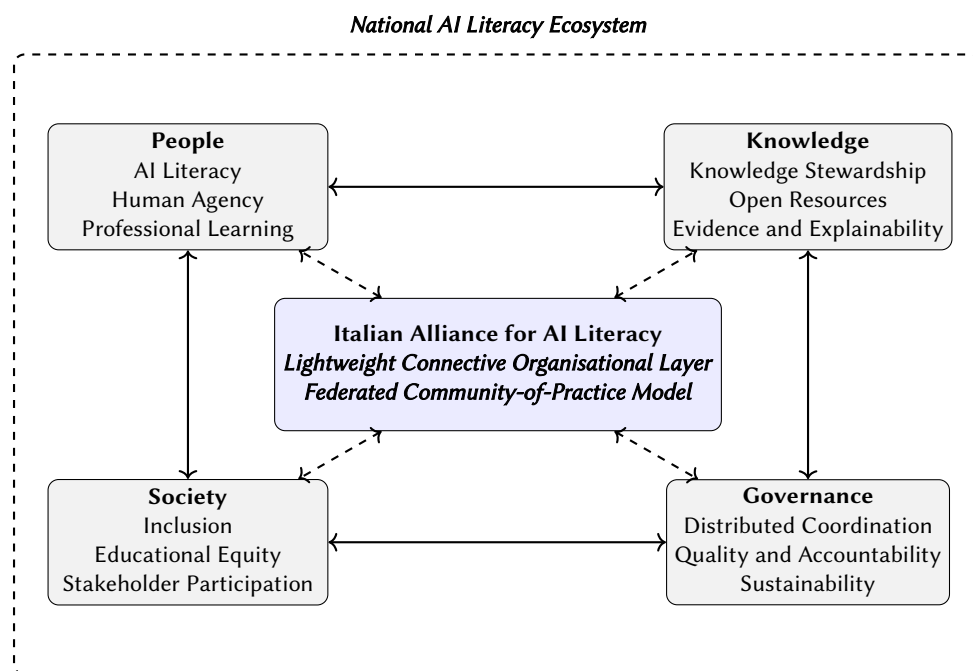


Figure 1: Four-dimensional analytical model of the *National AI Literacy Ecosystem*. The dimensions provide a common language for describing and relating contributions across the ecosystem. Solid arrows represent their interdependence; dashed arrows indicate the lightweight, connective, and non-hierarchical role proposed for the *Italian Alliance for AI Literacy*.

The four dimensions are interdependent and provide a common analytical language rather than organisational pillars or separate workstreams. Their practical value lies in supporting the mapping of initiatives, the identification of complementary expertise and underrepresented areas, and the discovery of potential connections across the ecosystem.

For example, the INDIRE initiatives discussed in Section 4.2 contribute to *People* through professional learning, to *Knowledge* through research and documented practices, to *Society* through work with geographically isolated and disadvantaged schools, and to *Governance* through networks connecting research, schools, and institutional actors. The heuristic therefore helps make the multidimensional contribution of an initiative explicit without reducing it to a single category.

The Alliance would use the four dimensions as a lightweight interpretive tool rather than as an administrative framework: organisations would not be required to adopt new structures, reclassify all their activities, or participate in four separate workstreams.

6. Lightweight Organisational Principles for the Italian Alliance

The four-dimensional model introduced in Section 5 provides a common language for describing and relating contributions across the *National AI Literacy Ecosystem*. Its practical use requires organisational arrangements through which autonomous actors can interact, exchange knowledge, and collaborate without transferring their responsibilities to a central authority.

Within this paper, *distributed governance* denotes the principle through which these relationships would be supported. The Alliance would not govern the ecosystem, authorise participation, or determine how institutions should implement Artificial Intelligence. Its role would be to facilitate connections

through transparent and revisable processes while preserving institutional autonomy, accountability, and responsibility for implementation.

The model therefore rests on three principles: participation should be voluntary, differentiated, and proportionate; facilitation should remain light and rely as far as possible on existing infrastructures and capacities; and participating organisations should retain decision-making authority over their own activities and resources.

The organisational model combines a light facilitation function, autonomous organisational nodes, and thematic or institutional Communities of Practice. Within the Alliance, a Community of Practice is understood as a sustained group organised around a shared domain, regular interaction, and the progressive development of a repertoire of knowledge and practice [13]. It may therefore include, for example, teacher educators, school leaders, researchers, disciplinary communities, or territorial networks. Broader institutions and stakeholder groups may participate in the Alliance without themselves constituting Communities of Practice.

Within this structure, the Alliance would support four complementary enabling functions.

- 1. Coordination and boundary connection.**

Facilitate communication across institutional, disciplinary, sectoral, and territorial boundaries, making existing expertise, initiatives, and needs more visible. This function may also connect professional communities with national and local public authorities, helping identify gaps between policy guidance and situated implementation without replacing institutional decision-making.

- 2. Knowledge stewardship and quality.**

Support proportionate procedures for documenting, contextualising, curating, and circulating resources and practices. Distributed stewardship, provenance information, and periodic review would help keep shared knowledge interpretable, reusable, and sufficiently current without requiring central validation of all contributions.

- 3. Community learning and professional development.**

Sustain peer exchange, mentoring, thematic dialogue, and collaborative experimentation through which participants can interpret technological change, compare experiences, and adapt practices to different contexts.

- 4. Evidence, reflection, and adaptive evaluation.**

Encourage participants to document experiences, interpret available evidence, and periodically assess the value, sustainability, and resource requirements of collaborative activities. These reflections would inform whether processes should be continued, revised, or discontinued.

The four functions are mutually reinforcing: boundary connections allow knowledge and experience to circulate; stewardship makes contributions more interpretable and renewable; Communities of Practice discuss and adapt them; and reflection supports the progressive revision of collaborative arrangements.

Participation remains a cross-cutting condition of the model. Organisations may contribute at different levels, from describing an initiative or sharing a resource to sustained participation in a Community of Practice. These principles are design propositions rather than an already agreed governance structure; their concrete allocation of responsibilities, participation mechanisms, and resource requirements would need to be examined through initial operationalisation.

7. Progressive Operationalisation of the Italian Alliance

The proposed Alliance could be operationalised through gradual organisational transitions rather than through the immediate establishment of a complete institutional structure. As summarised in Table 2 on the following page, the proposed pathway comprises four analytical and enabling stages, from initial alignment to institutional embedding. These stages do not constitute a mandatory roadmap: they may overlap, recur, or progress at different speeds according to stakeholder interest, available resources, and existing organisational capacities.

Table 2

Conceptual stages for the progressive operationalisation of the proposed *Italian Alliance for AI Literacy*.

Stage	Development focus	Indicative milestones
1. Alignment and Formation	Clarify purpose, principles, participation options, and light facilitation arrangements while mapping existing actors, initiatives, resources, and needs.	Shared purpose; initial stakeholder nucleus; preliminary ecosystem map; agreed scope for a limited pilot.
2. Collaborative Activation	Enable proportionate interaction among Communities of Practice and establish boundary connections across institutions, sectors, disciplines, and territories.	Active communities; sustainable participation; increased visibility of existing activities; initial cross-organisational collaboration.
3. Knowledge Consolidation and Contextual Adaptation	Document, connect, and adapt educational experiences and resources while supporting their use across different contexts.	Contextualised resources; documented adaptations; stronger links among research, professional learning, policy, and practice.
4. Institutional Embedding and Sustainability	Stabilise facilitation, knowledge-renewal processes, participation arrangements, and relationships with national and international initiatives.	Durable but lightweight arrangements; periodic review; continuity of participating communities; sustained contribution to national capability.

Institutional embedding in Stage 4 denotes the integration of sustainable collaborative relationships into participating organisations, not the creation of a central institution governing the ecosystem. The present paper provides the conceptual basis for Stage 1, while the pilot below represents one possible and reversible way of examining the model in practice.

7.1. A Proposed Six-Month Pilot for Stage 1

The pilot is conceived as a limited six-month cycle covering four basic activities: stakeholder onboarding, ecosystem mapping, thematic exchange, and collective review. Six months provides sufficient time to complete this cycle and observe continuity of participation while keeping the experiment bounded, reversible, and compatible with existing organisational commitments.

AIXIA, CINI, and ASSO EPICT could act as initial facilitators because they bring complementary scientific and technological, human-centred and epistemic, and pedagogical and professional-development expertise. Their role would be limited to convening participants, maintaining a lightweight shared working environment, supporting the mapping process, facilitating exchanges, and synthesising contributions. They would not own the Alliance or exercise authority over participating organisations.

Participants could initially be recruited through targeted invitations to institutions, professional communities, research groups, school networks, and other organisations already active in AI education, followed by voluntary expressions of interest. Different levels of engagement would be possible, from contributing information about an initiative or resource to participating regularly in a thematic Community of Practice.

The pilot would use the four dimensions—*People, Knowledge, Society, and Governance*—as flexible categories for describing participating initiatives and identifying complementary expertise, underrepresented areas, and potential connections. A lightweight shared workspace would be sufficient; no dedicated technological platform or permanent administrative structure would be required.

The cycle could include: i) an initial meeting to agree purpose, scope, and participation arrangements; ii) a concise mapping of participating actors, initiatives, resources, and needs; iii) one or more thematic exchanges around issues identified by participants; and iv) a final review of perceived value, effort, and possible continuation.

Evaluation would focus on organisational feasibility rather than educational impact. Evidence could be drawn from participation records, the initiative mapping, documented resources and connections, meeting notes, and a brief end-of-pilot questionnaire or structured feedback session. Indicators would

include participation diversity and continuity, contextual quality of documented contributions, emergence of cross-organisational connections, perceived usefulness of the shared environment and heuristic, proportionality of the effort required, and willingness to continue, revise, or extend the collaboration.

At the end of the six-month period, facilitators and participating stakeholders would review this evidence to determine which functions should be retained or revised and whether there is sufficient value and interest to proceed towards Stage 2. Success would therefore be defined not by rapid growth or institutional formalisation, but by the ability to generate useful relationships, interpretable shared knowledge, and collective learning with proportionate effort.

8. Conclusions and Future Directions

This paper has addressed a specific organisational challenge in AI literacy: how distributed actors, initiatives, resources, and professional communities can contribute to collective capability without being centralised or standardised. It proposes the *Italian Alliance for AI Literacy* as a lightweight connective layer within the broader *National AI Literacy Ecosystem*, adopting a federated Community-of-Practice model that preserves institutional autonomy and diversity.

The contribution is not a new AI-literacy framework, but a conceptual and organisational model combining four analytical dimensions—*People*, *Knowledge*, *Society*, and *Governance*—with four enabling functions, lightweight distributed-governance principles, and a non-prescriptive pathway for progressive operationalisation. Together, these elements provide a common language for mapping contributions, identifying complementarities and gaps, supporting cross-organisational connections, and examining how distributed knowledge and experience can contribute to a shared, human-centred AI culture.

The proposed six-month pilot represents a first opportunity to examine the model in practice. Its purpose is not to demonstrate educational impact, but to assess organisational feasibility, participation, connective value, knowledge renewal, sustainability, and the proportionality of the effort required. The evidence generated would inform decisions about whether the Alliance should be continued, revised, extended, or discontinued.

Although developed for the Italian context, the underlying principles of federation, lightweight connection, distributed stewardship, voluntary participation, and adaptive governance may also inform similar capacity-building processes elsewhere. Ultimately, the sustainable development of AI literacy will depend not only on the frameworks we define, but also on the communities and relationships through which they remain alive, interpretable, and actionable.

Declaration on Generative AI

During the preparation of this work, the authors used ChatGPT (OpenAI) to support paraphrasing and rewording, writing-style improvement, and grammar and spelling checks. All AI-assisted outputs were critically reviewed and edited by the authors, who take full responsibility for the content of the publication.

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