# Reclaiming Pedagogical Agency: The EDEH AI Squad's Main Drivers Framework for Responsible AI Adoption in European Education

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**Abstract**

*In response to the unregulated adoption of artificial intelligence (AI) in European schools, and to address the region's lag behind global technology leaders, the European Commission established the European Digital Education Hub (EDEH) as part of the Digital Education Action Plan (DEAP, 2021–2027). Between October 2025 and January 2026, the EDEH AI Squad — a group of 45 experts selected from across Europe — met online and in person to develop a Main Drivers Framework for the responsible adoption of AI in education. The framework identifies four interconnected drivers: Teacher Training in the Age of AI; Teachers as Co-Designers of AI; Public-Private Partnerships; and Data Literacy in the Age of AI. Drawing on current scholarship and UNESCO guidance, it emphasises a human-centred rather than technocentric approach to AI integration, and is designed as a modular toolkit allowing stakeholders to use each driver independently or in combination. This paper presents the framework's architecture, details the sub-group work on conditions for designing AI courses, analyses the structural tensions inherent in AI adoption across European education systems, and formulates actionable recommendations for policymakers, institutions, and educators.*
*This paper reflects the views of the author and the EDEH AI Squad. It does not represent the official position of the European Commission.*

**Keywords:** *Artificial intelligence in education; responsible AI adoption; teacher agency; data literacy; public-private partnerships; European Digital Education Action Plan*

## 1. Introduction

The integration of artificial intelligence (AI) into educational systems has emerged as one of the defining policy challenges of the current decade. European governments and supranational institutions are confronted with two interrelated challenges. Firstly, they must address the persistent structural technological lag relative to global leaders. Secondly, they are tasked with the management of the unregulated use of AI tools by students and teachers across member states. The issue is further compounded by the fact that a significant proportion of AI tools currently employed in educational settings were not originally developed for pedagogical purposes. Instead, these tools have been adapted or repurposed for learning purposes, frequently without the incorporation of appropriate pedagogical safeguards or alignment with the objectives of the curriculum [1].
It is within this policy context that the European Commission established the Digital Education Action Plan (DEAP) 2021–2027, a comprehensive framework providing networking opportunities and institutional instruments for the responsible adoption of digital technologies in education. The European Digital Education Hub (EDEH) was established by the Commission as part of the DEAP. This collaborative platform now comprises more than 7,000 members drawn from across the educational ecosystem. The EDEH is responsible for the organisation of thematic working groups, which are referred to as *squads*. The remit of these squads is to examine specific dimensions of the future of digital education.
In response to an open call launched in September 2025, the EDEH AI Squad was formed and worked from October 2025 to January 2026. Comprising 45 selected members from across Europe spanning education and training, policy, research, learning design, EdTech, and related fields, the squad collaborated primarily online through twice-monthly plenary meetings, complemented by regular working sessions in four sub-groups. A face-to-face workshop was held in Brussels in November 2025. The output of this collaborative process is the Main Drivers Framework, which identifies four interconnected drivers: Teacher Training in the Age of AI; Teachers as Co-Designers of AI; Public-Private Partnerships; and Data Literacy in the Age of AI. The framework was explicitly designed to prioritise a human-centred approach in keeping with current scholarship [1] and UNESCO guidance [2]. It is intended as a modular

toolkit: each driver corresponds to a toolset that can be used independently or combined with others depending on the stakeholder's role, priorities, and starting point.
The paper sets out to explore how the proposed framework's architecture and rationale can address the conditions for designing AI courses while accounting for the structural tensions inherent in European educational systems. It also seeks to identify actionable recommendations for policymakers, institutions, and educators.

## 2. The Main Drivers Framework: Architecture and Rationale

The integration of responsible artificial intelligence in education can be considered analogous to the construction of a temple resting upon complementary foundations. In order to facilitate the successful integration of artificial intelligence in this field, there is a requirement for distinct but complementary structural supports that are able to reinforce one another. The Main Drivers Framework identifies four such supports. Of particular note is the non-exclusive nature of the drivers' hierarchy: Data Literacy in the Age of AI functions as a transversal thread that connects and underpinns the other three, since data underpins how AI systems function and how their impacts are understood and governed.

### *2.1. Closing the Professional Development Gap*

Teacher professional development in AI has consistently lagged behind the deployment of AI tools in classrooms. To address this, the squad's first driver aims to equip educators with the skills, confidence, and critical awareness needed to understand both the potential and the risks of AI tools before adopting them for classroom use [3]. The driver is built around four pillars: Pedagogical Integration and Learning Design; Foundations, Policy and AI Literacy; Accessibility, Sustainability and Professional Development; and Classroom Practice, Tools and Implementation.
Concretely, the driver produced an advisory report for the European Commission's annual State of AI in Education assessment, a set of guidelines for building AI courses for teachers, and an example course on pedagogical integration and learning design [4]. These outputs are designed to be actionable and replicable across different national educational systems.

### *2.2. Repositioning Teachers as Co-Creators*

AI tools designed without teacher input tend to fail in real classrooms or cause unintended harm, reproducing misalignments between technological capability and classroom reality [5]. Addressing this, the squad produced a coherent four-part mini-pack: a needs analysis explaining why teacher co-design is essential; case studies and a journey map showing what meaningful co-design looks like in practice; a quick partnership checklist structuring collaboration before, during, and after the co-design cycle; and a teacher competency map clarifying what capacities are needed for effective co-design. These instruments reposition educators from end-users to co-creators of AI tools, ensuring that pedagogy, inclusion, ethics, and safety are embedded from the outset [6].

### *2.3. Governing the Market: Public-Private Partnerships*

Pedagogically principled AI integration cannot be sustained without restructuring the relationship between public educational systems and private EdTech providers. To this end, the squad developed Power, Priorities & Pitfalls, a card-based simulation game that enables educators, school leaders, SME owners/developers, and policymakers to explore the real trade-offs in AI-powered public–private partnerships. The game addresses four critical themes — Trust and Quality Assurance, Funding and Sustainable Investment, Governance and Regulation, and Market Fragmentation — through four distinct stakeholder perspectives. It can be deployed in policy labs, conference workshops, system strategy meetings, and training programmes.

### *2.4. Establishing a Shared Conceptual Vocabulary*

Data literacy serves as the pivotal connecting element among all three drivers: it makes teacher training more meaningful, co-design more reliable, and partnerships more balanced. The fourth driver produced two complementary sets of resources: guides for teachers supporting them in learning foundational data and AI concepts, and teaching scenarios and activities for different age groups (8–12, 12–16, 15–19, and across levels) providing ready-to-use classroom materials. Among the concrete outputs are a

practical glossary on data and AI, a traffic-light classification system for classroom data practices (DO / ONLY IF / DON'T), and an AI-assisted guide to data literacy lesson planning.

### 3. Sub-Group Work: Conditions for Designing AI Courses

Operating within the first driver, the sub-group on teacher training examined the pedagogical, institutional, and ethical conditions under which AI courses can effectively empower educators. Its work was motivated by three structural deficits identified in the literature (Fig.1): knowledge asymmetry, whereby teachers and students frequently lack awareness of ethical and open-source alternatives to dominant commercial platforms; pedagogical misalignment, whereby AI is grafted onto existing curricula without contextual adaptation; and a governance vacuum that exposes schools to vendor lock-in and data exploitation [1][2].

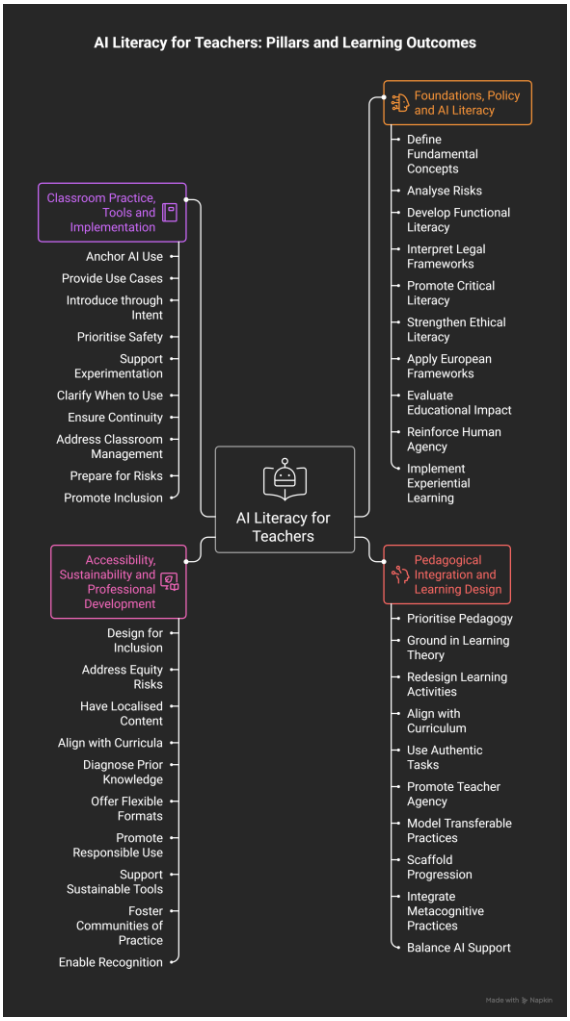


**Fig.1.** AI Literacy for Teachers: Pillars and Learning Outcomes

#### *3.1. Student Competency Objectives*

Responsible AI courses must develop competencies enabling critical, informed interaction with AI systems: digital literacy, computational thinking, ethical awareness, and practical application. At present, the predominance of self-directed learning as the de facto mode of AI skills acquisition produces structurally incoherent learning pathways that may inadvertently reinforce misconceptions [1]. The framework insists that structured curricular provision is not a supplementary option but a governance imperative.

#### *3.2. Teacher Agency and Professional Risks*

AI integration reshapes the professional role of teachers in ways that are simultaneously enabling and threatening [7]. Three risks require institutional attention: deskilling, whereby progressive automation of pedagogical tasks erodes professional expertise; loss of agency, whereby teachers risk being reduced to executors of algorithmically generated content; and psychological resistance arising from anxiety about professional identity dissolution [8][9]. These risks are not hypothetical; they are documented in empirical research across national contexts.
The framework's response is threefold: teacher-centred design of AI courses and tools; targeted deployment limited to clearly identified pedagogical challenges; and institutional provision of psychological support to facilitate a productive and sustainable relationship between educators and AI systems.

## 4. Structural Tensions in AI Adoption

Three structural tensions characterise AI adoption in European education. They are constitutive features of a genuinely complex sociotechnical transition, and the framework articulates principled responses to each.

### *4.1. Efficiency versus Pedagogical Autonomy*

AI systems are engineered for computational efficiency, optimisation, and scalability; education is fundamentally a relational, contextual, and intrinsically human enterprise [1]. Unmediated, this incommensurability produces a drift towards automation that progressively displaces pedagogical judgement. The framework's response is the principle of augmentation over automation: AI tools must extend what teachers can do rather than perform what teachers should do [10]. This is a categorical normative constraint, not a preference.

### *4.2. Ethical Compliance versus Functional Performance*

Ethically certified, European-hosted tools offer superior data sovereignty and GDPR compliance but may underperform commercially dominant tools operating outside European regulatory frameworks [2]. Rather than treating this as a binary choice, the framework advocates a stratified strategy: certified tools as the default institutional choice; structured negotiation with commercial providers for contractual safeguards on data use and pedagogical autonomy; and clearly delimited use of commercial tools with explicit constraints on data access and automated decision-making.

### *4.3. Standardisation versus Curricular Diversity*

The fragmentation of European educational systems — across languages, national curricula, pedagogical traditions, and regulatory frameworks — renders rigid standardisation both practically impractical and normatively undesirable [1]. The framework's response is the concept of flexible standardisation: common frameworks provide structural coherence while systematic local adaptation, peer learning communities, and multi-directional knowledge exchange preserve institutional autonomy and contextual relevance.

## 5. Recommendations

At the policy level, governments and European institutions should substantially increase investment in AI-specific teacher professional development programmes, introduce legally binding standards for public-private partnerships in education technology, and prioritise public funding for European AI tools designed specifically for educational contexts.
At the institutional level, educational establishments should adopt ethical procurement frameworks for AI tools, involve teachers actively in tool selection and evaluation, and establish communities of practice for sharing AI course design experiences across disciplines and national contexts.
At the level of individual educators, a stance of informed criticality towards AI tools, active engagement in co-design processes, and an incremental implementation strategy allowing for evidence-based adjustment of practice over time are the conditions under which responsible adoption can be sustained [2].

## 6. Discussion and Limitations

As an EDEH working document, the Main Drivers Framework has not been subject to formal peer review or large-scale empirical validation, and several recommendations retain a prospective and normative character. Its European scope may limit applicability to contexts operating under different regulatory regimes and institutional traditions. The pace of AI development also means that specific tool recommendations risk rapid obsolescence — a vulnerability the framework mitigates by anchoring guidance in durable pedagogical principles rather than in the capabilities of particular tools.
AI adoption in European education carries genuine risks alongside real opportunities. The risks — loss of professional autonomy, overreliance on AI, data exploitation, reinforced inequities, commercialisation of education, linguistic and cultural hegemony, spread of misinformation and bias, and environmental impact [11] — fall disproportionately on educators in less well-resourced systems. A framework that insists on teacher agency as both the means and the end of responsible AI adoption is therefore also, implicitly, a framework for educational equity.

## 7. Conclusion

Responsible AI adoption in European education requires more than technical guidance: it requires a governance architecture that places pedagogical agency, ethical grounding, and systemic sustainability at its centre. The EDEH AI Squad's Main Drivers Framework offers such an architecture — modular, human-centred, and attentive to the structural tensions that any serious engagement with AI in education must navigate. The four drivers — teacher training, co-design, public-private partnerships, and data literacy — are designed to function as a coherent yet flexible toolkit, not a prescriptive hierarchy.
Future research should prioritise empirical validation across diverse European educational contexts, and the development of evaluation instruments capable of measuring the impact of human-centred AI adoption on both learning outcomes and teacher professional wellbeing.

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