



PERSPECTIVE PAPER



THE ROLE OF THE EUROPEAN UNION IN SHAPING AN ETHICAL AND LEGAL FRAMEWORK FOR ARTIFICIAL INTELLIGENCE (AI) IN EDUCATION

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ABSTRACT

Purpose: This article analyzes the role of the European Union (EU) in shaping an ethical and legal framework for the use of artificial intelligence (AI) in education. It investigates how European institutions aim to ensure trustworthy, transparent, and human-centered AI, while also addressing the challenges of implementation across Member States.

Methodology: The study adopts a normative and documentary research design, drawing on EU policy strategies, legislative initiatives, and ethical guidelines. It further includes a case study of Romania, examining the extent to which European orientations are reflected in national education systems, with a focus on institutional readiness, digital capacity, and teacher training.

Findings: The analysis reveals a gap between high-level EU strategies—such as the proposed AI Act, the Digital Education Action Plan, and the Ethics Guidelines for Trustworthy AI—and the practical preparedness of Member States. Romania exemplifies these challenges, showing deficiencies in digital infrastructure, lack of teacher training, and absence of clear ethical standards. These discrepancies highlight the risks of fragmented governance and inconsistent adoption of AI in education.

Originality/Contribution: By combining normative analysis with a country-level case study, the article contributes to the academic debate on AI governance in education. It demonstrates the tension between innovation and fundamental rights and provides insights into the institutional and ethical conditions necessary for effective implementation.

Practical Implications: The study offers policy recommendations to strengthen teacher training, ensure algorithmic transparency, and establish certification and oversight mechanisms. It underscores the need for coordinated governance to safeguard equity, trust, and democratic values in the integration of AI in education.

Keywords: European Union; Artificial intelligence; Education policy; Ethical regulation; Governance; Romania

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1. Introduction

An increasing number of use cases in education are adopting AI to personalize learning, automate assessments, and analyze student progress. These technologies are frequently framed as tools that can enhance the efficiency of educational procedures and add support for teachers and learners more generally (Holmes, Bialik & Fadel, 2021).

But AI in education is not problem-free. Researchers point out critical risks, such as the lack of transparency in algorithms, the potential for subtle modes of discrimination, and the risk for students to be seen simply as data points in an opaque and impersonal system (UNESCO, 2021; Williamson & Eynon, 2020).

The European Union (EU) has identified these risks and has already started laying down, in recent years, an ethical and legal framework for the ethical development and use of AI, also in education. Although education remains a national matter, the EU promotes common rules and good principles of governance (see also the European Commission's website). Dawans and Venturini (2014) point out that reporting based on file capsules is not consistent with abstention from obtaining information (two core journalistic values). In 2021, the European Commission adopted the Artificial Intelligence Regulation (AI Act) that places AI systems in four risk bands and sets out clear obligations for operators and users. Stakes in AI in education are high, so the additional requirements of governance, transparency, and protection of fundamental rights should be stronger in comparison to other sectors (European Commission, 2021). This paper addresses the role of the European Union in shaping an ethical and legal framework concerning artificial intelligence in education. It analyzes the EU's strategic orientation, recent legislative efforts, and the difficulties involved in the transposition of these principles into national education systems.

In order to better explore the implementation of the European framework in practice, the article focuses on the Romanian case—a country of the EU, where the digitalization of education is unbalanced and the school infrastructure and digital competences are still below the average of the EU (European Commission, 2022). This option has been made in the hope of seeing how European orientations can be read in educational systems with all their structural and administrative limitations.

2. Methodology

This research is part of a normative and documentary analysis approach, focusing on how the European Union builds an ethical and legal framework applicable to the use of artificial intelligence in education. The article starts with the premises established by European strategies and legislative proposals, aiming to identify the directions of action, the institutional actors involved, and the challenges encountered in the implementation process.

In addition to the analysis of the European framework, the paper also includes a case study on Romania, as an EU member state, to examine how European policies are reflected (or not) in the national reality. The case study aims to highlight the gaps between European normative intentions and the administrative and institutional capacity of a member state to transpose these standards into education.

The research aims to answer the following questions:

How does the European Union build an ethical and legal framework for the integration of artificial intelligence in education, through policies, regulations and institutional mechanisms?

To what extent can European policies regarding the use of AI in education be effectively implemented in the national context, taking the case of Romania as an example?



Through this approach, the article aims to contribute to the understanding of how European governance can balance technological development with the protection of democratic values in education.

3. Theoretical framework: Artificial Intelligence in education and ethical foundations

The use of AI in education provides great opportunities but also introduces challenges. AI is employed in various guises - from adaptive systems that tailor the learning pace to automated marking systems, predictive algorithms of performance, or virtual teachers' assistants (Holmes, Bialik & Fadel, 2021). These technologies can help to make educational activities more efficient as well as favor learning from anywhere and facilitate decision-making in schools and universities.

However, the use of AI in education is not a neutral process. It involves a series of normative and technical choices that can negatively influence equity, confidentiality, and autonomy in the learning process. Among the main risks identified in the specialized literature are algorithmic opacity ("black-box algorithms"), the potential for discrimination and marginalization of certain categories of students, as well as the massive collection and use of personal data (Williamson & Eynon, 2020; UNESCO, 2021).

In this context, numerous international and European bodies have proposed principles that should guide the development and responsible use of AI. Among the most frequently mentioned are:

- ✓ transparency (the ability to understand how an AI system works),
- ✓ fairness (non-discrimination and equal treatment),
- ✓ human control (supervision of automated decisions by qualified individuals),
- ✓ data privacy,
- ✓ and responsibility of developers and users of technologies (European Commission, 2019; Jobin, Ienca & Vayena, 2019).

If these principles were to be adapted to education, there would be a need for a context-adapted application, given the specific pedagogical relationships, the social school dynamics, and the young age of beneficiaries in the end. For instance, an update that yields a certain sorting of students can influence student motivation, self-efficacy, and potentially even their academic pathway, if not properly managed (Holmes et al., 2021). Knowledge of those theoretical and ethical discourses is a prerequisite for any attempt to analyze public policy proposals and legal regulations about the use of AI in education. The only way to lay out a coherent and responsible vision of the integration of AI in this area is by keeping a permanent connection to the human dimension and democratic values.

4. European Union policies and instruments on artificial intelligence in education

The European Union has developed a series of policies, strategies and legal instruments in recent years to support the responsible development of artificial intelligence, including in the field of education. Although education is a shared competence, the EU exerts its influence through strategic guidelines, funding programs, cooperation mechanisms between Member States and legislative initiatives aimed at ensuring a common regulatory framework.

4.1. Strategic initiatives relevant to digital education

Among the most important European strategies in this area is the Digital Education Action Plan 2021-2027, which supports the usage of digital technologies for education and vocational training, considering inclusion, digital skills, and responsible data use (European Commission, 2022). It emphasizes the necessity of responsible use of AI, for example by encouraging educators, safeguarding private data, and investing in digital solutions aiming at benefiting students.

Simultaneously, the European Strategy on AI, launched in 2018 and updated in 2021, foresees investments in research, strengthening of public-private partnerships, and the creation of a trustworthy



European environment for AI innovation (European Commission, 2021a). This is the context in which the draft sensitive sector standards, for example, the education services standards, currently sit.

Another cross-cutting document is the Agenda for the European Education Area, which facilitates cooperation among Member States for the digitalization of education systems and the development of a common competence framework (European Commission, 2020). These papers highlight the EU's dedication to the ethical and responsible adoption of innovations.

4.2. The proposed AI Regulation (“AI Act”) and the impact on education

Launched in April 2021, the proposed AI Regulation (the so-called AI Act) is the world's first comprehensive legal framework for the regulation of artificial intelligence technologies (European Commission, 2021b). The proposal classifies AI systems according to the level of risk (unacceptable, high, limited and minimal), and systems used in education, especially those that influence educational trajectories, are classified as high risk.

This classification implies strict obligations for providers and users of these systems: increased transparency, technical documentation, human oversight, risk management and assessment of the impact on fundamental rights. For the educational environment, this approach implies increased responsibility in the selection and implementation of AI-based technologies, with a focus on the protection of minors, personal data and equity in the learning process (Veale & Borgesius, 2021).

It is important to note that although the regulation is not yet adopted, the debates in the European Parliament and the Council suggest a clear direction: the use of AI in education will only be possible under strict conditions of transparency and control, to avoid negative consequences on students' rights.

5. The role of European institutions in the development of the regulatory framework on AI in education

Algorithm regulation in education is governed by multiple European institutions, with specific roles in policy-making, decision-making, and policy and regulation monitoring. Whilst education remains largely a competence of the Member States, the European Union has strengthened over the last few decades as a strategic actor in the development of common norms and promotion of unified regulation regimes about new technologies (Craig & de Búrca, 2021). The role of the European Commission is essential in this regard, as it is the creator of the legislative proposals and the coordinator of the horizontal strategies. As AI is concerned, the Commission has produced strategic documents, including the White Paper on Artificial Intelligence (European Commission, 2020) and internationally vetted ethical guidelines, like the Ethics Guidelines for Trustworthy AI (European Commission, 2019). In terms of education, the Commission supports the responsible use of digital technologies through the Digital Education Plan (2022) and pilot initiatives under the Digital Europe program. The Commission also, in its proposed AI Regulation, offers a threshold to classify some of these educational applications as ‘high risk,’ requiring more onerous technical and legal requirements for developers and users.

The EU Parliament is one of the key actors in the public debate on AI regulation and has substantially focused on protecting fundamental rights. In its resolutions and reports (European Parliament, 2020), Parliament has repeatedly called for democratic oversight of new technologies, underlining that surveillance, algorithmic discrimination, and digital exclusion are on the rise. For instance, in October 2020, the adopted Ethical Frameworks for AI Report: Policy: Parliament calls for education-related systems to respect privacy, ensure fair access to education, and protect minors. They also lobbied for the AI systems and robots to be transparent and audited regularly to prevent abuse or systematic flaws.

It is the task of the EU Council to negotiate final EU laws with the Parliament on behalf of the governments of the Member States. Regarding AI, the Council encourages the acceptance of a coordinated legal framework but does not forget to recognize the principle of subsidiarity, particularly concerning education. In its latest conclusions, the Council called for investment in teachers' digital skills, for 'education



infrastructure and the exchange of best practices among the Member States' (Council of the EU, 2022) but also ruled that the regulation of AI needs to be flexible and adjusted to the context of individual Member States.

What is less appreciated, I think, is the intersection of AI in education with human rights, democracy, and the rule of law. Institutionally deployed projects such as chatbots or adaptive learning tools at the school level may, without systemic safeguards, end up undermining learners' privacy, agency, and dignity. In a review of the field, the Council of Europe (2022) warns that AI-supported education technologies, though hopeful, threaten to violate fundamental values if not supported by clear lines of accountability, transparent governance frameworks, and participatory oversight that includes all voices.

Inter-institutional cooperation on the governance of AI in education The inter-institutional cooperation on the governance of AI in education is a multi-dimensional approach, which is based on legislative initiative, democratic oversight of the use of AI, referring to national diversity and scientific support (all coming together to prepare a European framework for the use of AI in education that is sustainable and as equitable as possible).

6. Challenges and limitations in the application of the regulatory framework on (IA) in education

Although the European Union proposes a coherent direction for regulating artificial intelligence in education, the translation of these principles into the concrete reality of the education systems in the Member States raises numerous difficulties. The challenges are linked not only to institutional and legislative differences, but also to the technical capacity, digital infrastructure, organizational culture and level of digital literacy of the actors involved.

6.1. Diversity of education systems and lack of legislative harmonization

Each EU Member State has its own nationally regulated education system, with significant differences in curricula, teaching methods and policies on technology in education. In this context, the uniform application of a common regulatory framework on AI becomes difficult. Even if the AI Act will be a directly applicable regulation, its implementation in schools and universities will depend on the capacity of each state to adapt infrastructure, secondary legislation and professional training to the new requirements (Veale & Borgesius, 2021).

6.2. The tension between innovation and the protection of fundamental rights

In the area of education, the development and inclusion of AI technologies should tread the line between exploiting innovative potential and securing basic rights. For children and adolescents, deploying AI may raise risks of surveillance, profiling, discrimination, and a violation of personal autonomy (UNESCO, 2021). For example, algorithms measuring student behavior from automatically tracked data may generate false positive feedback, stigma, or even uninformed action without human intervention (Williamson & Eynon, 2020).

6.3. Lack of clear standards for auditing and certifying AI-based education systems

Despite ethical recommendations developed by the European Commission and expert groups, there are currently no uniform and binding technical standards for auditing AI systems used in education. The lack of clear certification and control mechanisms generates uncertainty for educational institutions and can discourage responsible adoption of digital technologies (Floridi et al., 2018). In addition, many educational institutions lack the necessary technical or legal capacity to assess the compliance of the systems used with European standards.



6.4. The need for continuous training and digital literacy for teachers

One of the most pressing challenges is the insufficient level of training of teachers to use AI-based technologies critically and ethically. Existing training programs in many Member States do not include a component of digital ethics or an understanding of the functioning of algorithms (Holmes et al., 2021). This knowledge deficit can lead to an uncritical use of automated educational tools, to the detriment of the pedagogical process and the teacher-student relationship.

7. Case study: Romania - disagreements between the European strategy and the reality of national implementation

Romania, as a member state of the European Union, is involved in the strategies and regulations proposed by European institutions on the responsible use of artificial intelligence in education. However, the analysis of the domestic situation reveals a series of major inconsistencies between the European guidelines and the actual level of preparation and applicability at the national level.

While Romania has (beginning with 2024-2027 (Government of Romania, 2024) pursued even in the education sector a strategic direction on artificial intelligence, the level of detail and operational framework specially designed for education is not yet evident. This document generally refers to education as one of the priority areas for digitalization and highlights the importance of digital literacy and teacher training. However, it lacks any technical standards, audit mechanisms, or ethical guidelines as to how AI should be used in schools and universities. In the absence of a specific sectoral implementation plan, the educational entities in Romania work in a regulatory void that exposes them to the danger of uncontrolled use of new technologies.

Experiments with adaptive educational platforms or chatbot-type tools, led so far by private actors (e.g., Brio or Kinderpedia), are still evolving in a regulatory vacuum from an ethical and legal perspective. While there are clear gains in the use of such applications for personalizing learning and the organizational processes of educational provision, what remains to be seen is the extent to which such applications contribute to data security in the management of personal data and educational relationships.

The National Strategy for Artificial Intelligence 2024-2027 also acknowledges the need for a clear regulatory framework for the use of AI in sensitive fields such as education, focusing on technological audit, algorithmic transparency, and the involvement of all necessary actors - including parents, teachers, and students - in decision-making. Nevertheless, the application of fundamental principles is still weak, while the absence of ethical oversight mechanisms and/or the impact of digital equity and automated surveillance bring additional challenges (Government of Romania, 2024; Bucea-Manea-Țoniș et al., 2022).

AI-based projects tend to be started by local actors or individual organizations. For instance, in Romania, some universities integrated AI-based systems using adaptive learning or the use of chatbots or automated essay scoring for specific courses. But this work is not being scaled up or assessed through a national, coherent lens. A study of 139 Romanian and Serbian lecturers' points to continuous challenges: no clear institutional guidelines, limited ethical regulation, and mismatched digital literacy training in the universities (Bucea-Manea-Țoniș et al., 2022). It brings to light legitimate questions about data governance, pedagogic coherence, and the fair adoption of AI in education.

This fragmented approach reflects the absence of an integrated national strategy for the digitalization of education. The "Education and Training Monitor" report published by the European Commission shows that Romania consistently ranks below the EU average in terms of the use of technology in education, digital literacy and teachers' IT skills (European Commission, 2023).

Through the National Recovery and Resilience Plan (NRRP), Romania allocates significant funds for the digitalization of schools and the provision of equipment (Component C15 - Education). However, teacher training and the development of a culture of digital ethics remain peripheral elements, poorly funded and rarely tracked as performance indicators (Ministry of Education, 2022).

The European Schoolnet report reveals that a mere 19% of teachers in Romania self-report that they are very confident in the advanced use of digital technology, and there is virtually no ongoing training in AI



(European Schoolnet, 2021, p. 1). This lack of training results in a superficial, often passive, application of digital tools, without a critical understanding of the risks and ethical implications.

This case study reflects an ontological gap between EU goals for AI use in education and Romania's potential to translate these intentions at a national level. Without a specific legal framework, control mechanisms and a unitary course of action, the use of artificial intelligence in the Romanian education system is sporadic, uneven and potentially risky. Despite a theoretical openness to innovation, without a clear handle on digital governance, Romania remains vulnerable to emerging European standards. In this context, the following recommendations are required:

- ✓ Adopting a national strategy dedicated to AI in education, which should include both technical and ethical standards, as well as evaluation and control mechanisms regarding the use of algorithms in schools and universities.
- ✓ Establishing a national continuous training program for teachers, focused on algorithmic literacy, digital ethics and the critical use of AI-based technologies, with the support of European funds already allocated through the PNRR and other EU initiatives.

8. Recommendations and development prospects

In the context of the accelerated advance of artificial intelligence and the increasing pressure to digitize education, the European Union is faced with a key challenge: to create a regulatory framework that allows for technological innovation without compromising fundamental rights and the quality of the educational process. This analysis shows that, although the strategic directions formulated at the European level are coherent and well anchored in clear ethical principles, their concrete application in the national education systems remains uneven and marked by structural deficiencies.

In order to support an efficient and equitable implementation of artificial intelligence in education, it is necessary to formulate a specific European sectoral framework, complementary to the general proposal for regulation (AI Act). This framework should include clear criteria on transparency and auditing of AI systems used in educational contexts, establish obligations adapted to the specificities of educational institutions, distinct from those applicable to commercial actors, and provide for additional protection measures for pupils and students, as vulnerable users of digital technologies.

At the same time, to strengthen trust in these systems and support responsible selection of technologies, it is recommended to establish a European voluntary certification mechanism, similar to the "Trustworthy AI" label, applicable to educational platforms, applications and tools that comply with European standards of ethics, fairness and data protection.

Another essential pillar is the continuous training of teachers in all Member States, focusing on digital and algorithmic literacy, understanding the risks and limitations of AI-based systems, and the application of ethical principles in educational practice. European initiatives such as Erasmus+ and the European Digital Education Hub can contribute to the development of an interdisciplinary training network, necessary for teachers to become active and critical users of technology.

Lastly, successful public policies in this field demand the integration of inter- and transdisciplinary research. Discussing the lack of conversation between experts, the role AI will play in education must be discussed with educators themselves. Funding programs like Horizon Europe can help European consortia continue to study the impact of AI on education and develop solutions tailored to local realities and national policy responses with them.

One dimension that is often under-considered in the application of AI in education is the active participation of critical actors in society, such as students and parents. In addition to the technical and institutional guarantees that are necessary at the level of the EU, it is crucial to develop a culture of digital and algorithmic literacy among these users for their fully informed and fair participation to be facilitated. The OECD (2021) emphasizes that students and their families are not passive recipients of educational technologies and co-construct understanding and trust in digital spaces. The beliefs, attitudes, and concerns of stakeholders



in teaching and education are likely to play a major role in determining the acceptance or otherwise of AI in the classroom. As such, we need to expand beyond legal compliance and teacher training within policy work to focus on mechanisms of dialogue, consultation, and co-designing with students/parents, particularly around data privacy, algorithmic decision-making, and fairness. Social resistance and misuse of AI technologies at schools can be seriously increased without their significant involvement, particularly in societies with low digital inclusion or institutional distrust.

In summary, AI governance in education is not just a technical-normative operation, but needs to be grounded in a comprehensive vision, based on human rights, social justice, and actual institutional embedding.

The European Union has the necessary tools to become a global leader in promoting ethical educational AI, but this objective can only be achieved through the active and responsible involvement of all actors, from European institutions to teachers in every classroom.

9. Conclusion

This paper has analyzed how the European Union is trying to outline an ethical and legal framework for the use of artificial intelligence in education, through a set of strategic policies, regulatory instruments and institutional mechanisms. The answer to the first research question shows that, although education is not an exclusive competence of the EU, the European institutions - particularly the Commission, the Parliament and the Council - play an active role in defining common standards, in promoting “trustworthy” AI and in classifying the risks associated with these technologies through the proposed AI Act.

It has also highlighted the importance of programmatic documents such as the Digital Education Action Plan and the Ethics Guidelines for Trustworthy AI, which establish principles such as transparency, fairness, human oversight and the protection of personal data as fundamental benchmarks for the implementation of AI in education.

The response to the second research question, as emerged from the case of Romania, is primarily indicative of a mismatch between the European regulatory definition and the way it is implemented in practice at the national level. Despite Romania having recently adopted the National Strategy on Artificial Intelligence 2024-2027, such is in a general nature, referring to the formation and not having in place an action plan or more detailed standards for ethics formation, audits of systems, or certification of educational applications. Fragmentation of local-level measures continues; the emphasis is still largely on digital infrastructure and the embryonic and oversight aspects are limited.

These results point to the conclusion that for AI to be a fair and trustworthy tool for education, a strong European framework is not sufficient; policy coherence, political resolve and real commitment from each and every EU Member State are required.

The added value of the paper is, first of all, to make the normative, moral and institutional dimensions of European governance for AI in education pieces to an analytic frame that has been little thematized in the specialized literature, and particularly in the Romanian academic space.

Secondly, the analysis through the Romanian case study adds practical value by demonstrating how good intentions at the European level can be undermined in the absence of coordinated digital governance at the national level. Finally, the study emphasizes the necessity of actions designed to develop localized solutions and underlines the importance of teacher training and technological transparency to avoid risks related to the implementation and use of AI in education.

Finally, the article offers clear public policy recommendations (Figure 1), useful for both European and national decision-makers, with a view to real, not just formal, alignment with democratic values and ethical standards promoted by the European Union.

A future research direction could analyze the reception and application of AI in education in other Central and Eastern European member states, to highlight common regional trends or structural differences. Given the imminent adoption of the AI Act in its final form, the observations of this study can serve as a guide for the internal harmonization of educational policies in the Member States.

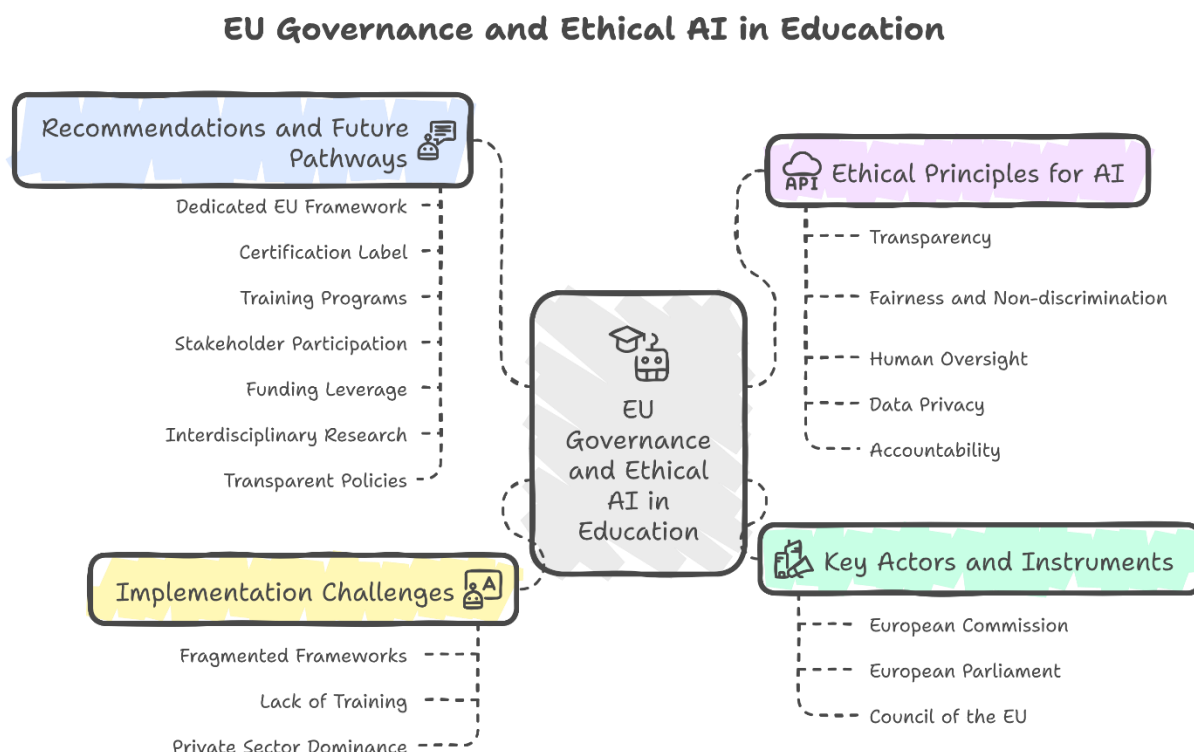


Figure 1: Public policy recommendations

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