Artificial intelligence regulation in Brazil, the EU, and the UK and its impacts on education

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ARTICLE

ARTIFICIAL INTELLIGENCE REGULATION IN BRAZIL, THE EU, AND THE UK AND ITS IMPACTS ON EDUCATION[1]

REGULAMENTAÇÃO DA INTELIGÊNCIA ARTIFICIAL NO BRASIL, NA UE E NO UK E SEUS IMPACTOS NA EDUCAÇÃO

REGULACIÓN DE LA INTELIGENCIA ARTIFICIAL EN BRASIL, LA UE Y EN EL UK Y SUS IMPACTOS EN LA EDUCACIÓN

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ABSTRACT:
The increasing integration of artificial intelligence (AI) into education brings opportunities and challenges. Appropriate, effective regulation is needed to address ethical, privacy, and algorithmic bias issues, ensuring that AI is used fairly, ethically, and equitably in education. This paper critically examines the current regulatory frameworks in Brazil, the European Union (EU), and the United Kingdom (UK), shedding light on their impact on educational systems. The EU's AI Act identifies high-risk AI applications in education, such as those used for admissions, assessments, and monitoring behavior, raising concerns about potential bias and inequality. The UK's flexible, innovation-driven approach highlights the importance of sector-specific oversight but risks inconsistencies in implementation. In Brazil, AI regulation is still developing, with ongoing legislative efforts focusing on balancing innovation with ethical considerations and rights protection. We argue that for AI to benefit education without exacerbating existing inequalities, regulatory frameworks must address algorithmic bias, promote AI literacy, ensure transparency, and protect privacy. The comparative analysis reveals gaps in those three regulations and emphasizes the need for adaptable, context-specific strategies prioritizing ethical AI integration in education. We also provide some recommendations to be addressed on those regulations to safeguard our educational practices and offer clearer guidance to educators.
Keywords: artificial intelligence; regulation; education.
RESUMO:
A crescente integração da inteligência artificial (IA) na educação traz oportunidades e desafios. Diante disso, uma regulamentação adequada e eficaz é necessária para abordar questões éticas, de privacidade e de viés algorítmico, garantindo que a IA seja usada de forma justa, ética e igualitária na educação. Este artigo examina criticamente as atuais estruturas regulatórias no

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Brasil, na União Europeia (UE) e no Reino Unido, lançando luz sobre seus impactos nos sistemas educacionais. A legislação de IA na UE identifica aplicações de IA de alto risco na educação, como aquelas usadas para admissões, avaliações e monitoramento de comportamento, levantando preocupações sobre potenciais vieses e desigualdades. A abordagem flexível e orientada para a inovação do Reino Unido destaca a importância de supervisão específica por setor, porém corre o risco de possibilitar inconsistências na sua implementação. No Brasil, a regulamentação da IA ainda está em desenvolvimento, com esforços legislativos em andamento focando em equilibrar a inovação com considerações éticas e proteção de direitos. Argumentamos que, para que a IA beneficie a educação sem exacerbar as desigualdades existentes, as estruturas regulatórias devem abordar o viés algorítmico, promover o letramento em IA, garantir a transparência e proteger a privacidade. A análise comparativa revela lacunas nessas três regulamentações e enfatiza a necessidade de estratégias adaptáveis e específicas de contexto que priorizem a integração ética da IA na educação. Também fornecemos algumas recomendações a serem abordadas nessas regulamentações para proteger nossas práticas educacionais e oferecer orientação mais clara aos educadores.
Palavras-chave: inteligência artificial; regulamentação; educação.
RESUMEN:
La creciente integración de la inteligencia artificial (IA) en la educación trae oportunidades y desafíos. Se necesita una regulación adecuada y eficaz para abordar cuestiones éticas, de privacidad y de sesgo algorítmico, garantizando que la IA se utilice de forma justa, ética y equitativa. Este artículo examina críticamente los marcos regulatorios en Brasil, la Unión Europea (UE) y el Reino Unido, arrojando luz sobre su impacto en los sistemas educativos. La ley de IA de la UE identifica aplicaciones de IA de alto riesgo en la educación, como las que se utilizan para las admisiones y las evaluaciones, lo que genera inquietudes sobre sesgos y desigualdades. El enfoque flexible y impulsado por la innovación del Reino Unido destaca la importancia de la supervisión de sectores específicos, pero con riesgo en su implementación. En Brasil, la regulación de la IA aún se está desarrollando, y los esfuerzos legislativos en curso se centran en equilibrar la innovación con consideraciones éticas y la protección de derechos. Sostenemos que para que la IA beneficie a la educación sin exacerbar las desigualdades existentes, los marcos regulatorios deben abordar el sesgo algorítmico, promover el letramento en IA, garantizar la transparencia y proteger la privacidad. El análisis comparativo revela lagunas en esas tres regulaciones y destaca la necesidad de estrategias adaptables y específicas para cada contexto que prioricen la integración ética de la IA en la educación. También ofrecemos algunas recomendaciones para abordar en estas regulaciones para salvaguardar prácticas educativas y brindar una orientación a los educadores.
Palabras clave: inteligencia artificial; regulación; educación.

Introduction

The ability of computers to adapt to new situations, solve problems, answer questions, suggest plans, and perform various functions historically associated with human intelligence, commonly referred to as artificial intelligence (AI), is advancing at an unprecedented rate. These features AI provides can significantly benefit the educational landscape through innovative applications, enhanced teaching and learning, personalized learning experiences for students, and streamlined tasks for educators. The synergy between AI and education became more noticeable in the 1990s with the establishment of the *International Journal of Artificial*

Intelligence in Education in 1989 and the *International AI in Education Society* in 1993 (Williamson; Eynon, 2020). These developments laid the groundwork for a deeper exploration of the potential of AI to revolutionize education, signaling a shift toward integrating advanced computational tools into teaching and learning environments.

The advent of generative AI systems, such as ChatGPT[2], in the early 2020s made AI truly capture widespread attention in the educational discourse. These AI platforms marked a critical turning point, bringing excitement and concerns regarding the profound social and ethical implications of AI. For instance, ChatGPT not only demonstrated remarkable capabilities in natural language processing but also raised numerous questions regarding its implications for educational practices. The discussions about education in the present and the future permeated by AI have generated significant debate and criticism from educators, ethicists, and policymakers alike (Chomsky; Roberts; Watumull, 2023; Teixeira, 2023b).

The rapid growth of AI in education was neither unexpected nor unplanned. It stems from decades of academic research, the expanding influence of the education technology industry, and the proliferation of data-driven governance practices that seek to optimize educational outcomes using AI technologies (Williamson; Eynon, 2020). Despite these long-standing technological developments, the application of AI in the educational context still raises significant issues. Questions surrounding how AI can effectively support personalized learning, enhance student engagement, or address disparities in access to education are still open for further research. Most research and development has happened with little engagement with the potential consequences of using AI in education (Holmes; Tuomi, 2022). Additionally, the potential risks of privacy, data security, and algorithmic biases require more in-depth investigation to ensure that AI tools do not exacerbate existing inequalities or undermine educational fairness. From a critical perspective, Williamson and Eynon (2020) highlight that little is known about the daily use of AI-based systems in education considering varied contexts.

In Brazil, research has begun to address the disruptive influence of AI technologies like ChatGPT on traditional teaching and learning methods (Citelli, 2024; Porto,;Santos; Bottentuit Jr, 2024; Santos; Chagas; Bottentuit Junior, 2024). These recent studies highlight the challenges associated with restructuring education to accommodate AI-driven tools, including concerns about the changing roles of teachers, the evolving nature of student engagement, and the ethical considerations surrounding the influence of AI in classrooms. However, the research landscape in Brazil, and more broadly in Latin America, remains underdeveloped compared to regions

[2] https://chatgpt.com/

such as Europe and North America, where AI has already been integrated into educational systems at various levels. There is a need for more studies investigating how AI tools can be adapted to Brazil's specific cultural, societal, and economic conditions and the unique challenges and opportunities AI presents in this context. This is indeed one of the explicit concerns of the Brazilian Plan for Artificial Intelligence (PBIA), launched in mid-2024.

In response to the growing concerns about the impact of AI on education, some guidelines and recommendations have been put forward to help educators and policymakers navigate the complexities of AI integration. The United Nations Educational, Scientific and Cultural Organization (UNESCO) advocates for a human-centered approach to regulating the use of generative AI in education, emphasizing the importance of protecting human dignity and autonomy in educational settings (Unesco, 2023). The Spanish government took a more direct approach, focusing on the ethical practices of students and teachers when using AI technologies, ensuring that AI is used responsibly and equitably in classrooms (Gobierno de España, 2024). These approaches reflect a growing recognition that AI is not merely a tool to facilitate teaching and learning but also a force requiring broader reconsideration of educational policies and ethics.

Despite the international efforts, more research is needed into policy frameworks that can adequately address the risks and benefits of AI in education, particularly in regions like Brazil. While organizations such as UNESCO have produced documents to help guide policymakers in understanding the opportunities and challenges presented by AI (Unesco, 2021), there remains a significant gap in terms of how these global frameworks can be turned into effective, context-specific regulations that address the unique needs and realities of individual nations. More efforts are also needed to critically analyze the applicability of these global recommendations in diverse educational contexts and to identify gaps in research and policy. For Selwyn (2022), AI shall be scrutinized by those who make decisions affecting education and educators.

In this paper, we aim to contribute to the growing body of literature on AI in education by analyzing the regulatory approaches of two key European jurisdictions, the European Union (EU) and the United Kingdom (UK), and the one in development in Brazil. This exploratory study relies on documentary research (Sá-Silva; Almeida; Guindani, 2009) to examine the current AI regulations in the EU, the UK, and Brazil as primary sources and reflect on their implications for education. Upon analyzing these regulatory frameworks, we also provide some recommendations to address those regulations for their impact on educational systems.

Current regulations and nation-wide plans in Europe and Brazil

Analyzing documents and regulations requires considering them as syntheses of a historical moment and a cultural context, allowing us to make contextualized analyses and fair observations. We have chosen the AI regulation from the EU and the UK because they represent some of the first regulations on this topic that have been officially published in their territories. These documents resulted from debates and consultations with experts over the last four years. Therefore, they can be considered a statement of current concerns about AI. These documents still require analysis and reflection, mainly because they are documents that, due to their importance, can inspire other territories, such as Brazil, in constructing their regulations.

This section provides an overview of the EU AI Act, published in June 2024, and the UK's framework for AI regulation, proposed in 2023. We also describe the current development of the AI regulation in Brazil as enacted by the country's legislative bodies, the government, and the academia.

The EU AI Act

The EU AI Act, established by Regulation (EU) 2024/1689 in June 2024, was constructed and debated for years after the European Commission published the first proposal to regulate AI in the EU in April 2021, thus becoming one of the first structured frameworks available worldwide. While recognizing the advantages and progress derived from AI, the EU AI Act warns of possible material, physical, psychological, social, or economic risks and losses. The regulation aims to promote the adoption of AI centered on the subject and trust, respecting the EU's fundamental rights. Moreover, it refers to the Charter of Fundamental Rights of the European Union (European Union, 2000), highlighting the articles on the right to freedom, security, and data protection.

The EU's AI regulation mainly relies on principles and risks. For developing the trustworthiness of AI, it refers to the 2019 Ethics Guidelines for Trustworthiness AI (European Commission, 2019), proposed by an independent AI expert group, which highlights seven principles: human agency and oversight, technical robustness and safety, privacy and data governance, transparency, diversity, non-discrimination and fairness, societal and environmental well-being, and accountability. On the other hand, a substantial part of the EU AI Act regards a risk-based approach. Even though it considers four levels (see Table 1), most of the EU AI Act focuses on high-risk AI systems as imperatively subjected to regulation.

Table 1 – The EU AI Act risk-based approach.

Type	Description	Examples	Requirements
Minimal or no risks	Most AI systems do not pose significant risks. These mechanisms optimize decision-making without generating the risk of manipulation or affecting health, safety, and fundamental rights.	Spam filters, AI in video games	Not regulated or affected by the EU AI Act
Limited risks	This level includes AI systems with a risk of manipulation or deceit	Chatbots	Transparency obligations. Humans must be informed about their interaction with AI.
High risks	AI applications that could negatively affect the health and safety of people, their fundamental rights, or the environment areas	AI used in critical infrastructure (transport, energy), education (student assessment), employment (recruitment), and access to essential services (credit, social security)	Subject to compliance requirements for gaining access to the EU market (compliance assessment, risk management, transparency requirements, and human oversight)
Unacceptable risks	Application types that are incompatible with EU's values and fundamental rights. These include cognitive behavioral manipulation, predictive policing, emotion recognition in the workplace and educational institutions, and social scoring. Remote biometric identification systems such as facial recognition will also be banned, with some limited exceptions.	Social scoring systems by the government, subliminal manipulation to cause harm, and toys with voice assistants that encourage dangerous behavior in children	Not allowed by the EU AI Act

Source: Prepared by the authors.

Regarding education, the EU AI Act emphasizes two crucial points. The first one underscores the need for providers and developers of AI systems to possess a deep understanding of AI literacy. The second point focuses on identifying specific types of high-risk AI systems in education and vocational training. Article 4 of the EU AI Act demands that AI system providers and developers take measures to ensure sufficient AI literacy among their staff, considering technical knowledge, experience, context of use, and people who use AI systems. The EU AI Act also highlights four uses explicitly classified as high-risk AI systems in the context of education: (i) determination to access or admission; (ii) evaluation of learning outcomes; (iii) assessment of the appropriate level of education that an individual will receive or will be able to access; and (iv) monitoring and detecting prohibited behavior of students

during tests. All this high-risk AI system typification seeks to mitigate the impact of AI systems on the right to non-discrimination and the right to education, guaranteed by the Charter of Fundamental Rights of the European Union.

The UK's framework for AI regulation

A proposal presented to the UK Parliament by the Department for Science, Innovation, & Technology outlines the government's strategy to regulate AI while promoting innovation (United Kingdom, 2023). The proposal is a comprehensive attempt to balance AI's potential societal and economic benefits with the risks it can pose while setting a clear strategic vision for the UK to become a global leader in AI by 2030 with the government's commitment to provide significant financial investments.

One of the notable strengths of the document is its emphasis on a flexible, context-specific regulatory approach. By focusing on the context in which AI is deployed rather than the technology itself, the framework aims to avoid a one-size-fits-all regulatory model that could stifle innovation. This approach acknowledges the diverse applications of AI, from healthcare to transportation, each with unique risks and benefits. The document acknowledges the potential risks associated with AI, such as physical and mental health impacts, privacy infringements, and ethical concerns. Unsurprisingly, this trend is not new in the framework as it heavily relies on existing regulators to oversee AI applications within their respective sectors. While this leverages their expertise, it may also lead to inconsistencies in regulatory enforcement and interpretation across different sectors.

The UK's framework for AI regulation adopts a flexible approach intended to address the speed at which AI technology advances and outlines broad principles and objectives. The document sets out the five basic principles of the regulation, warning that regulators will implement these in specific ways in different contexts and areas. The principles are (i) safety, security, and robustness, (ii) appropriate transparency and explainability, (iii) fairness, (iv) accountability and governance, and (v) contestability and redress. Annex A of the regulation lists 17 actions to guide the implementation of these principles. Nonetheless, the framework lacks detailed implementation strategies since it does not fully address specifics on how to enforce, monitor, and evaluate it. Without robust mechanisms for continuous monitoring and updating of regulations, the framework may become outdated, failing to keep pace with technological advancements.

The UK government's proposal to regulate AI while promoting innovation sets an ambitious agenda for the UK. However, there are positive and negative implications when considering its impact on the education sector. On the one hand, AI holds significant potential to revolutionize education through personalized learning, enhanced administrative efficiency, and innovative learning environments. On the other hand, concerns about over-reliance on technology, equity issues, a lack of focus on AI literacy, and ethical considerations temper this optimism.

Towards some regulation for AI in Brazil

Brazil was one of the pioneers in proposing AI regulations (Teixeira, 2023a). The Chamber of Deputies initiated discussions towards some bill for regulating AI in February 2020, but the Federal Senate has not yet approved the legislation, and there is currently no scheduled date for voting on it. The proposal has faced challenges in reaching a consensus on balancing technological development with the responsibilities imposed on sectors and companies that use AI-based tools while also seeking to promote innovation and competitiveness.

Draft Bill No. 2338/2023, currently under discussion, establishes general national standards for developing, implementing, and responsibly using AI systems in Brazil. The aim is to protect fundamental rights and ensure the implementation of safe and reliable systems, benefiting human beings, democracy, and scientific and technological development (Federal Senate of Brazil, 2023). In addition to defining guiding principles for developing and using these systems, the bill provides rights for people affected. It also presents a risk classification for assessing AI systems before making them available, inspired by the regulation adopted by the EU. However, unlike European legislation, which views AI as a product that must undergo assessment and certification processes before being introduced into the market, Brazilian legislation emphasizes the protection of rights. The proposal also includes governance obligations for agents (providers and operators) of AI systems, addressing issues such as transparency, bias mitigation, adequate data management, algorithmic impact, privacy, and security, and defining responsibilities and sanctions in case of damages and incidents.

While legal and regulatory frameworks have yet to be implemented in Brazil, the development and use of AI have advanced rapidly. In 2019, the Brazilian government began drafting the Brazilian Strategy for Artificial Intelligence (EBIA) to guide this progress. Nevertheless, the document, finalized in 2021, proved to be overly generic and lacking in

concrete goals, specific actions, and a budgetary perspective, besides being misaligned with the country's socioeconomic reality, including the striking inequalities and asymmetries present in the Brazilian society (Bioni; Mendes; Almeida, 2023). In July 2024, the Brazilian Ministry of Science, Technology, and Innovation launched the Brazilian Plan for Artificial Intelligence (PBIA) to guide the ethical and sustainable development and application of AI in Brazil. PBIA aims to strengthen the country's technological capacity, leadership, and sovereignty in the area, in addition to helping to solve major national challenges in several areas. Over the next four years, PBIA seeks to promote significant advances through actions and investments in five areas: infrastructure, research, and development in AI; dissemination, training, and qualification in AI; application of AI to improve public services; business innovation; and support for the regulation and governance of AI in Brazil (IA Responsável, 2024).

Besides government initiatives, the national scientific community is involved in developing and using AI in Brazil. In July 2024, the Brazilian Computer Society (SBC), the largest South American scientific society in Computing, proposed a national plan for AI (Sbc, 2024). Proposed by renowned and experienced experts in the field of AI in Brazil, the document offers a diagnosis of the current scenario and a plan with short-, medium-, and long-term goals for the implementation and monitoring of the use of AI in various sectors of society. The SBC's National AI Plan is structured around four main axes: training human resources in AI; expanding research, development, and innovation in AI, including partnerships between academia, industry, and government; ethical and responsible use of AI; and expanding the AI ecosystem in Computing. The plan also recognizes the need to regulate AI in Brazil, but it warns that regulation should not impose restrictions that hinder innovation or create legal uncertainty and should be flexible enough to keep up with the rapid evolution of technology.

The bill under discussion in the Brazilian legislative bodies incorporates the risk-based classification of AI systems adopted by the EU AI Act and the basic principles for regulation outlined by the UK's framework, including an adaptive nature to technological advancements of AI and bolstering innovation. While PBIA foresees actions in the education policy area, it focuses on immediate AI applications (e.g., students' frequency management and trajectory prediction, data analysis, intelligent tutoring systems, and enhancement of student learning) or on investments driven to training a workforce in AI, i.e., PBIA lacks a comprehensive policy addressing essential concerns such as ethics, privacy, and bias mitigation. On the other hand, the SBC's initiative with the National AI Plan only considers education for AI in terms of qualifying human resources to work in the field, overlooking its use in education and the

consequent implications and issues to address, even though it advocates for an ethical, socially responsible AI.

Impacts of AI regulation for education systems

The regulation of AI in educational systems poses several challenges and issues that need careful attention to ensure that AI tools enhance learning without undermining core educational values. As AI becomes increasingly integrated into educational environments, it is essential to navigate these developments with robust regulatory frameworks. For example, the EU AI Act highlights the potential benefits and risks associated with AI, underscoring the importance of responsibly managing its application. However, significant challenges remain concerning fairness, ethics, privacy, and AI literacy.

One of the critical challenges identified in the EU AI Act is the **high-risk classification** of certain AI systems in education. These systems, specifically those intended for student admissions, evaluation of learning outcomes, assessment of appropriate education levels, and monitoring of student behavior during tests, are flagged as potentially harmful if not properly regulated. The concern is that AI could inadvertently or otherwise exacerbate existing inequalities within the educational system. For example, suppose AI systems are used to decide who gains access to certain educational opportunities. In that case, there is a risk that they may inherit and amplify biases that exist in the data they are trained on. This could result in unfair admissions practices or skewed assessments of students' potential, disproportionately affecting marginalized or underrepresented groups. As such, regulating these systems requires not only technical oversight but also a deep understanding of social justice and equity in education, which is crucial for ensuring fair and equitable outcomes.

AI literacy is another significant issue raised by the EU AI Act. While the regulation emphasizes the need for providers and developers of AI systems to ensure their staff has sufficient AI literacy, it falls short of specifying what that entails or how it should be enforced. This lack of clarity challenges educational institutions expected to integrate AI into their operations. Teachers, students, and administrators alike must possess a certain level of understanding of AI technologies to use them effectively and ethically. Without clear guidelines or standards for what AI literacy should look like in practice, implementing AI in education may be inconsistent or inadequate. Educators may not fully understand AI systems' limitations and potential biases, and students may be exposed to technology they are not equipped to engage with critically. Therefore, fostering AI literacy across all levels of education is crucial

to ensuring these tools are used responsibly and inclusively. This includes integrating AI-related topics into existing curricula and developing specialized AI programs and courses to make students and educators well-versed in AI technologies, their applications, and ethical implications. AI literacy is indeed a general aim of many policymakers in the sense of educating the public about AI to increase people's awareness and trust of AI (Schiff, 2021).

A compassionate challenge in AI in education is the risk of discrimination due to **biases**. High-risk AI applications, such as those involved in admissions or student assessment, are especially vulnerable to biases. AI systems are typically trained on historical data, and if those data reflect existing societal biases, whether based on race, gender, socioeconomic status, or other factors, there is a real danger of perpetuating these biases. For example, suppose an AI system is trained on past admissions data from an elite institution that historically admitted predominantly wealthy students. In that case, it may prioritize similar applicants, thus reinforcing existing inequalities. This risk highlights the need for carefully designing and rigorously testing AI systems used in education to ensure they do not entrench or exacerbate discriminatory practices. The UK's regulation proposal briefly mentions AI literacy as needed for shaping a continuum of business and citizen participation in constructing and using AI tools, but there is no concern related to the education field.

Ethical and privacy concerns also loom large when discussing AI regulation in education. Using AI systems to monitor student behavior during exams or other assessments raises questions about how much students' privacy is respected. AI-driven surveillance tools, such as those that track eye movements or facial expressions during tests, can be seen as invasive and potentially harmful to students' mental well-being. Moreover, collecting and storing vast amounts of data about students' behaviors, learning patterns, and personal characteristics pose significant privacy risks. Without robust safeguards, these data could be misused or leaked, leading to a breach of students' rights to privacy. The challenge for regulators is to balance the need for AI to enhance educational outcomes and the imperative to protect students from intrusive surveillance and data misuse. Neither of the previously presented regulations shows us any ethical and privacy concerns specifically to the educational field.

While integrating AI into education holds significant promise for improving learning outcomes and making education more efficient, it also presents numerous challenges that must be addressed through comprehensive regulation. Schiff (2021) analyzed 24 national AI policy strategies from several countries developed by G-7 and other Global North countries (e.g., United States, United Kingdom, France, Germany, Italy, Japan, Finland, Norway, etc.), besides

relevant global actors, such as India, China, and Russia. The documents he examined typically discuss the potential of AI to drive innovation and economic development, the need to capitalize on AI to advance national competitiveness, and the impact of AI in diverse areas, including education. Moreover, they shed light on some social and ethical concerns, sometimes providing ethical governance principles. However, a significant finding from his study was the remarkable absence of AI in education from these policy strategies, and even less its ethical implications. This absence underscores a crucial gap and emphasizes the need for policymakers to consider the role of AI in education.

The classification of high-risk AI systems, the need for AI literacy, the potential for bias and discrimination, and ethical and privacy concerns are all critical issues that must be carefully managed. To navigate these challenges successfully, policymakers, educators, and technologists must work together to ensure that AI promotes fairness, equity, and respect for students' rights. By doing so, the transformative potential of AI in education can be realized without compromising the fundamental values that underpin educational systems.

Conclusion

Integrating AI into education holds significant promise for improving learning outcomes and making education more efficient. However, it also presents numerous challenges that must be addressed through comprehensive regulation. The classification of high-risk AI systems, the need for AI literacy, the potential for bias and discrimination, and ethical and privacy concerns are all critical issues that must be carefully managed. To navigate these challenges successfully, regulation must push AI to promote fairness, equity, and respect for the rights of people. By doing so, the transformative potential of AI in education can be realized without compromising the fundamental values that underpin educational systems.

The use of AI in education systems has been one of the main topics of conversation amongst academics of all levels of education ever since the explosion of tools that students can use to cheat on demonstrating their learning. While we accept that AI has the potential to revolutionize educational practices by enhancing personalized learning, improving administrative efficiency, and fostering innovation, it also presents significant risks. The different regulation tools of the EU, UK, and Brazil have identified various high-risk AI systems in education, such as those used for admissions, assessment, and monitoring student behavior, which, if not properly regulated, can exacerbate inequalities and infringe on privacy rights. Furthermore, the lack of clear guidance on AI literacy and the potential for algorithmic biases

also pose additional challenges. AI may entrench existing inequalities and lead to unintended negative educational consequences without adequate safeguards and a focus on ethical and responsible implementation.

This paper discussed how regulation is critical to ensuring that AI systems are designed and deployed to align with fundamental rights, such as fairness, non-discrimination, and privacy. Regulatory frameworks must be continually updated to keep pace with AI technologies' rapid development, ensuring that AI's potential benefits in education are maximized without compromising ethical standards for educational equity. The EU AI Act and the UK's framework for AI regulation present indicators to modulate the impacts of AI in the educational field. The EU's regulation is driven by risk levels focusing on classification, discrimination, and inequality, violating the right to education. The UK's proposal focuses on raising awareness to educate consumers, that is, on AI literacy under the logic of transparency and explainability, but without operationalizing the process. We consider that both regulations have important axes, but, when analyzed separately, they do not adequately respond to all the challenges that AI currently presents to education.

Based on the analysis of what has been proposed in the EU, the UK, and Brazil, we provide some recommendations to be addressed on those regulations to safeguard our educational practices and offer more precise guidance to educators:

1. **AI literacy is an urgent matter.** To ensure that AI systems are effectively and ethically integrated into education, there is an urgent need to prioritize AI literacy for all stakeholders: teachers, students, administrators, and policymakers. Clear, comprehensive guidelines should be developed to define the necessary competencies in AI literacy, covering the ethical, technical, and social dimensions of AI use in education. Training programs for educators should focus on understanding the capabilities and limitations of AI systems, while students should be educated on how to engage critically and responsibly with AI-driven technologies. On the other hand, regulatory frameworks must guide educators in effectively using AI-based tools without compromising the human elements of teaching. They shall be encouraged to view AI as a supportive tool rather than a replacement for their roles.
2. **Algorithmic bias must be rigorously addressed.** One of the critical risks associated with AI in education is the potential for algorithmic bias, which can perpetuate discrimination and inequality. AI developers and policymakers must work together to implement rigorous testing and evaluation processes for AI

systems, ensuring they do not disproportionately impact marginalized or disadvantaged groups. Independent audits and impact assessments should be mandatory for all high-risk AI applications in education, particularly those used for admissions and student assessments.

3. **AI systems in education should be transparent and accountable.** Educational institutions and AI providers must disclose the algorithms used in decision-making, such as admissions or grading. Students and parents should have access to clear explanations of how AI systems work and how decisions are made. Additionally, there should be mechanisms for students to appeal AI-based decisions and for schools to rectify any issues arising from using AI technologies. Transparency and accountability can lead to better understanding and trust, and educators and students can make more informed decisions about the use of AI-based tools.
4. **Privacy concerns related to AI surveillance in education must be addressed through stringent data protection measures.** AI systems that monitor student behavior during exams or use biometric data for assessment purposes should be limited, and their use must comply with national and international data protection laws. Schools and institutions should avoid using invasive AI technologies that could harm students' mental well-being. Moreover, student data collection should be minimized to only what is necessary for educational purposes. Therefore, having strict rules on data collection and use can protect people's personal information, ensuring that educational technologies handle these data responsibly and ultimately safeguarding their privacy.
5. **Regulatory frameworks governing AI in education must remain flexible and adaptable to the fast-paced advancements in AI technologies.** Governments should establish continuous monitoring mechanisms to review and update AI regulations, ensuring they remain relevant and effective. Policymakers should work closely with educators, technologists, and ethicists to craft regulations that balance innovation with protecting fundamental educational values. This includes ensuring that AI supports, rather than replaces, human educators and that its use aligns with broader educational goals.
6. **AI development for educational purposes must prioritize inclusivity and ethics from the outset.** Developers should be encouraged to create AI systems that are accessible and adaptable to diverse educational environments, including under-resourced schools and communities. Moreover, ethical considerations must be

embedded into the AI design process, ensuring that AI applications in education respect human rights and promote social justice. Guidelines promoting fair access to AI tools can help bridge educational disparities and maintain fairness and objectivity in educational assessments and interactions.

By addressing these recommendations, the potential of AI to enhance educational outcomes can be fully realized while mitigating the risks of inequality, discrimination, and privacy violations. AI in education must be implemented responsibly, with a strong focus on inclusivity, ethics, and fairness, to impact students and society positively. For AI to truly benefit education, there needs to be a balanced approach that embraces technological advancements and addresses the risks and challenges associated with AI implementation. Policymakers, educators, and institutions must work together to ensure that AI is used ethically, inclusively, and responsibly. This is crucial to fully realizing its transformative potential in education without compromising fundamental educational values.

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