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# ETHICAL CHALLENGES IN AI USE IN SCHOOLS: A STUDY OF DATA PRIVACY, SURVEILLANCE, AND BIAS

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## ABSTRACT

*The rapid integration of Artificial Intelligence (AI) in school education has transformed teaching methods and administrative processes, offered personalized learning experiences, and streamlined management. However, this adoption has raised significant ethical concerns, particularly in the areas of data privacy, surveillance, and algorithmic bias. This study explores these ethical challenges, drawing insights from a comprehensive literature review. The findings highlight the potential risks associated with AI-powered educational tools, including threats to student privacy, the psychological impact of continuous surveillance, and the perpetuation of existing societal inequities. The study emphasizes the urgent need for robust ethical governance frameworks to ensure responsible and equitable AI deployment in schools. Key implications for educators, policymakers, and developers are discussed, focusing on the development of AI literacy, the establishment of clear guidelines and regulations, and the adoption of ethical-by-design approaches. The study concludes by calling for further research into the long-term impacts of AI in education, increased stakeholder awareness, and comprehensive policy reform to create a regulatory environment that promotes innovation while safeguarding ethical principles. Addressing these challenges is crucial for harnessing the potential of AI to enhance education while mitigating risks and ensuring the best interests of all learners.*

**KEYWORDS:** *Artificial Intelligence (AI), Data Privacy, Surveillance, Student Privacy, Algorithmic Bias, Personalized Learning, Algorithmic Bias*

## 1. INTRODUCTION

The integration of Artificial Intelligence (AI) in school education has rapidly evolved in recent years, transforming traditional teaching methods and administrative processes. AI technologies are increasingly being adopted to enhance learning experiences, personalize instruction, and streamline educational management. This integration spans various aspects of the educational ecosystem, from intelligent tutoring systems and adaptive learning platforms to automated grading tools and predictive analytics for student performance.

In teaching and learning, AI plays a multifaceted role. Intelligent tutoring systems provide personalized learning experiences by adapting to individual student needs and learning styles. These systems can identify knowledge gaps, offer targeted feedback, and adjust the difficulty level of content in real time. AI-powered virtual assistants support both students and teachers by answering queries, providing explanations, and offering additional resources. Furthermore, AI facilitates the creation of immersive learning environments through augmented and virtual reality, enhancing engagement and comprehension of complex concepts.

In school administration, AI streamlines processes such as student enrollment, resource allocation, and scheduling. Predictive analytics help identify students at risk of dropping out or requiring additional support, enabling timely interventions. AI-driven data analysis assists in curriculum development and policy-making by providing insights into learning trends and educational outcomes.

However, the rapid adoption of AI in schools has given rise to significant ethical concerns. Data privacy emerges as a primary issue, as AI systems collect and process vast amounts of sensitive student information. The potential for unauthorized access, data breaches, or misuse of personal data raises questions about student privacy rights and data protection measures. Surveillance concerns arise from the use of AI-powered monitoring systems in classrooms and online learning platforms, potentially infringing on student autonomy and creating a culture of constant observation.

Bias in AI algorithms presents another critical ethical challenge. AI systems trained on historical data may perpetuate existing societal biases, leading to unfair treatment or discrimination against certain student groups. This bias can manifest in various forms, from skewed assessment results to biased recommendations for educational pathways.

As AI continues to reshape education, addressing these ethical challenges becomes imperative to ensure that technological

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advancements align with educational values and student well-being.

## 2. RESEARCH QUESTIONS

- What are the major ethical concerns associated with AI integration in school education?
- How does AI affect student data privacy in schools?
- In what ways does AI-based surveillance influence classroom environments and student behaviour?
- How do biases in AI systems affect equitable access and outcomes in education?
- What ethical frameworks or policy guidelines exist to regulate the use of AI in schools?

## 3. REVIEW OF LITERATURE

### AI in School Education: An Overview

AI in education has gained global recognition, with countries like China integrating AI into their high school curriculum (Ottenbreit-Leftwich et al., 2021). In India, AI adoption in education presents both challenges and opportunities, with infrastructural constraints and resource limitations being major hurdles (Agarwal & Vij, 2024). However, the potential for AI to revolutionize the educational landscape remains significant. AI applications in schools include adaptive learning systems, intelligent tutoring robots, and virtual classrooms (Alam, 2022). These tools can personalize learning experiences, provide real-time feedback, and create interactive environments. For example, large language models like GPT-4 are being integrated into Intelligent Tutoring Systems to enable dynamic content generation and customized feedback (Maity & Deroy, 2024). Interestingly, while AI education is being implemented at the high school level, there are fewer examples at the primary level. A study of 9–10-year-olds revealed that students' understanding of AI often focuses on programming and robotics, with some misconceptions about AI designs and implementations (Ottenbreit-Leftwich et al., 2021). In conclusion, AI in school education offers immense potential for enhancing learning outcomes and preparing students for future careers. However, successful implementation requires addressing challenges such as infrastructure, resource allocation, and ensuring pedagogical accuracy (Agarwal & Vij, 2024; Maity & Deroy, 2024). As AI literacy becomes increasingly important, developing comprehensive AI education concepts for different age groups is crucial (Kandlhofer et al., 2016).

### Ethical Concerns in AI Use in Schools

Educational ethics in AI encompass the moral principles and guidelines governing the responsible use of AI technologies in educational settings. This includes addressing concerns related to data privacy, algorithmic bias, transparency, fairness, and equity in AI-powered educational tools and systems (Barnes & Hutson, 2024; Bulut & Beiting-Parrish, 2024). The scope of educational ethics in AI extends to various aspects of the learning environment, including assessment methods, personalized learning, academic support, and administrative processes (D'Souza et al., 2024; Valerio, 2024). It also involves considerations of human rights, data ownership, consent, and the potential for digital exclusion (Ungerer & Slade, 2022). Interestingly, while AI offers significant benefits in education, it also presents unique challenges at the intersection of healthcare, AI, and education ethics, particularly in medical education (Busch et al., 2023). To address these concerns, frameworks and guidelines have been proposed, such as the seven core principles for safe AI in education and the establishment of ethics committees (D'Souza et al., 2024; Peñalvo et al., 2024). Ultimately, the goal is to ensure that AI contributes positively to educational settings while mitigating potential risks and ethical pitfalls (Barnes & Hutson, 2024; Dabbagh et al., 2024).

### Data Privacy and Protection Issues

The proliferation of digital technologies has led to exponential growth in personal data generation, creating new vulnerabilities and enabling systemic corruption (Gulyamov & Raimberdiyev, 2023). This is particularly concerning in higher education, where increasing volumes of complex student data are collected, raising privacy concerns that affect both qualitative and quantitative research (Florea & Florea, 2020). A key issue is the lack of transparency in data collection methods, with privacy policies often obfuscating unethical data handling practices (Pollach, 2005). Many websites and apps fail to provide complete privacy policies or collect sensitive data inconsistently with their stated practices (Fan et al., 2020). The General Data Protection Regulation (GDPR) has attempted to address these issues, leading to an increase in privacy policies and cookie consent notices on websites (Degeling et al., 2019). However, there remains a lack of functional and usable mechanisms for users to consent to or deny the processing of their personal data (Degeling et al., 2019). To address these challenges, new approaches are being developed, such as the Data Capsule paradigm for automatic compliance checking (Wang et al., 2019) and the Data Privacy Vocabulary for improved interoperability in privacy management (Pandit et al., 2019). However, a digital ethics framework may be necessary to fully address the unprecedented challenges raised by big data analytics and AI in personal data protection (Lacroix, 2019).

### Surveillance and Student Autonomy

AI surveillance in schools includes facial recognition for security and attendance and emotion tracking for engagement assessment (Andrejevic & Selwyn, 2019; Savchenko et al., 2022). These technologies can monitor students' facial expressions, head movements, and emotional states in real time, both in physical classrooms and e-learning environments (Gupta et al., 2023; Trabelsi et al., 2023; Vishnumolakala et al., 2023). While these systems aim to enhance teaching effectiveness and student engagement, they raise concerns about student autonomy and privacy. The constant monitoring may create an authoritarian and oppressive atmosphere in schools, potentially altering the nature of education (Andrejevic & Selwyn, 2019). Moreover, the psychological impact on students being continuously observed and analysed could be significant. However, some studies suggest that AI-based emotion recognition can support responsive teaching and personalized learning experiences (Herrero et al., 2023; Vishnumolakala et al., 2023). The technology may also benefit students with special needs by enabling more accessible and

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inclusive teaching practices (Sharma et al., 2023). Balancing the potential benefits with ethical concerns remains a critical challenge in implementing AI surveillance in educational settings.

**Algorithmic Bias and Educational Equity**

Algorithmic bias in educational AI systems can arise from various sources, including biased training data, flawed algorithmic design, and lack of diversity in development teams (Baker & Hawn, 2021; Hall & Ellis, 2023). These biases can have significant consequences, particularly for marginalized groups, potentially amplifying existing societal inequities (Baker & Hawn, 2021; Loukina et al., 2019). The impact on diverse student populations is substantial, with evidence showing bias based on race/ethnicity, gender, nationality, socioeconomic status, and disability (Baker & Hawn, 2021). For instance, automated scoring systems in language proficiency assessments may unfairly disadvantage non-native speakers (Loukina et al., 2019). Such biases can lead to unfair outcomes in critical areas like admissions, performance evaluation, and personalized learning (Bulut & Beiting-Parrish, 2024; Hutson et al., 2022). Addressing these issues requires a multifaceted approach, including improving diversity in AI development teams, increasing awareness, integrating ethics into the design process, and implementing human-in-the-loop systems (Bulut & Beiting-Parrish, 2024; Hall & Ellis, 2023). Additionally, adopting speculative and liberatory design thinking can help developers better understand the contexts of underrepresented groups (Gaskins, 2022). Ultimately, ensuring fairness and equity in educational AI systems is crucial for promoting inclusive and effective learning environments.

**Policy Frameworks and Ethical Guidelines**

Global policy frameworks for education and AI ethics have been developed by organizations like UNESCO and OECD, aiming to address challenges in the digital age. UNESCO's vision of global citizenship and OECD's framework for global competence offer distinct conceptualizations of education's future (Vaccari & Gardinier, 2019). UNESCO's "Recommendation on the Ethics of Artificial Intelligence" provides guidelines for policymakers on ethical AI development and use, particularly in education and communication (Morandín-Ahuerma, 2023). India's National Education Policy (NEP) 2020 aligns with UN Sustainable Development Goals, emphasizing access, equity, affordability, accountability, and quality in education (Kumar et al., 2020). It also focuses on integrating Industry 6.0 technologies like AI, AR, VR, and IoT to transform the education system (Anandraj, 2024). However, implementation challenges persist, including limited empirical validation, scaling issues, and digital inequities (Anandraj, 2024; Kumar et al., 2020). Ethical challenges in AI use in schools, particularly concerning data privacy, surveillance, and bias, are significant concerns. The rise of neurotechnologies and AI-based brain data analytics has sparked debates around "neurorights," including mental privacy, integrity, and cognitive liberty (Ligthart et al., 2023). Big data analytics and AI-driven profiling challenge compliance with information privacy principles, necessitating ethical oversight beyond traditional data protection regimes (Lacroix, 2019). To address these challenges, a digital ethics framework is needed to identify, analyse, and communicate new human realities in the context of technological changes (Lacroix, 2019). Integrating ethical principles such as human-centered values, transparency, accountability, and inclusiveness in AI use in education is crucial (Drach et al., 2023). However, gaps in implementation and governance remain, highlighting the need for continued efforts to embed ethical dimensions across all levels of education systems (Isser et al., 2024).

## 4. FINDINGS AND OBSERVATIONS

**Summary of key insights from the reviewed literature**

AI in education is gaining global recognition, with countries like China integrating it into high school curricula. AI applications in schools include adaptive learning systems, intelligent tutoring robots, and virtual classrooms, offering personalized learning experiences and real-time feedback. Implementation challenges include infrastructural constraints, resource limitations, and ensuring pedagogical accuracy, particularly in developing countries like India. AI literacy is becoming increasingly important, necessitating comprehensive AI education concepts for different age groups. Ethical concerns in AI use in schools encompass data privacy, algorithmic bias, transparency, fairness, and equity. The proliferation of digital technologies has led to exponential growth in personal data generation, creating new vulnerabilities in educational settings. AI surveillance in schools, including facial recognition and emotion tracking, raises concerns about student autonomy and privacy. Algorithmic bias in educational AI systems can amplify existing societal inequities, particularly affecting marginalized groups. Global policy frameworks and ethical guidelines for AI in education have been developed by organizations like UNESCO and OECD. The implementation of AI in education aligns with sustainable development goals but faces challenges in scaling and addressing digital inequities.

**Ethical risks and overlooked areas**

Psychological impact of continuous AI surveillance on students' well-being and learning experience. Potential for AI systems to reinforce or exacerbate existing biases in educational assessment and decision-making processes. Risks associated with data breaches and unauthorized access to sensitive student information. Ethical implications of using AI for predictive analytics in education, potentially influencing student opportunities and outcomes. Challenges in obtaining informed consent from students and parents for AI-driven data collection and analysis. Potential for AI to replace human interaction in education, affecting social and emotional learning. Ethical considerations surrounding the use of neuro technologies and AI-based brain data analytics in educational settings. Long-term effects of AI-driven personalized learning on cognitive development and critical thinking skills. Ethical dilemmas in balancing the benefits of AI surveillance for security and engagement with student privacy rights. Overlooked areas in addressing the digital divide and ensuring equitable access to AI-enhanced education.

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**Patterns, Contradictions, and Under-Researched Themes**

| Pattern | Contradiction | Under-researched theme |
|---|---|---|
| Increasing focus on integrating AI literacy into school curricula, particularly at the high school level. | While AI offers personalized learning benefits, it also raises concerns about privacy and autonomy. | Long-term impacts of AI integration on student learning outcomes and skill development. |
| There is a growing emphasis on developing ethical frameworks and guidelines for AI use in education. | AI surveillance aims to enhance teaching effectiveness but may create an oppressive atmosphere in schools. | Effective strategies for implementing AI ethics education across different age groups and cultural contexts. |
| Increasing recognition of the need for diverse development teams to address algorithmic bias. | While AI can promote inclusive education, it may also exacerbate existing educational inequities if not carefully implemented. | Impact of AI on teacher roles, professional development, and pedagogical practices. |
| Growing concern about the intersection of AI, education, and healthcare ethics, particularly in medical education | The promise of AI to enhance educational outcomes conflicts with the potential to exacerbate existing inequalities, as access to advanced AI-powered educational tools may be limited to well-funded institutions or affluent students. | The long-term effects of AI-mediated learning on students' critical thinking skills and ability to engage in traditional face-to-face academic discourse and debate. |

## 5. DISCUSSION

The findings of this study highlight the complex interplay between technological innovation in education and ethical considerations. From a utilitarian perspective, AI-powered educational tools offer significant potential benefits in terms of personalized learning, improved accessibility, and enhanced efficiency. However, deontological ethics emphasize the importance of respecting individual autonomy and privacy, which may be compromised by extensive data collection and algorithmic decision-making in educational settings.

The tension between innovation and ethical concerns reflects the broader debate in educational philosophy between progressive and traditional approaches. While AI technologies align with progressive ideals of individualized instruction and student-centered learning, they also challenge traditional notions of the teacher's role and the human elements of education.

**Challenges in Balancing Innovation and Ethics**

1. Data privacy and security: Implementing robust safeguards for student data while leveraging the benefits of data-driven personalization.
2. Algorithmic bias and fairness: Ensuring AI systems do not perpetuate or exacerbate existing inequalities in education.
3. Transparency and explainability: Developing AI tools that are understandable to educators, students, and parents to maintain trust and accountability.
4. Human-AI collaboration: Striking the right balance between AI assistance and human judgment in educational decision-making.
5. Digital divide: Addressing disparities in access to AI-powered educational tools to prevent widening achievement gaps.
6. Ethical AI development: Incorporating ethical considerations throughout the design and implementation process of educational AI technologies.

**Implications for Educators, Policymakers, and Developers:**

Educators

- Develop AI literacy to effectively integrate and critically evaluate AI tools in their teaching practices.
- Prioritize the development of uniquely human skills such as creativity, critical thinking, and emotional intelligence.
- Advocate for ethical AI use in their institutions and contribute to the development of AI policies.

Policymakers

- Establish clear guidelines and regulations for the use of AI in education, addressing issues of privacy, fairness, and transparency.
- Invest in research to better understand the long-term impacts of AI on learning outcomes and student well-being.
- Develop frameworks for the ethical assessment and certification of educational AI tools.

Developers

- Adopt ethical-by-design approaches in the development of educational AI technologies.
- Collaborate closely with educators and ethicists to ensure AI tools align with educational values and ethical principles.
- Prioritize transparency and explainability in AI systems to build trust among stakeholders.
- Continuously monitor and address potential biases in AI algorithms and datasets.

By addressing these implications, stakeholders can work toward harnessing the potential of AI in education while upholding ethical standards and educational values. This balanced approach will be crucial in shaping a future where technology enhances rather than compromises the fundamental goals of education.

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## 6. CONCLUSION

The rapid integration of artificial intelligence in educational settings presents significant ethical challenges that demand urgent attention and action. Key concerns include potential biases in AI algorithms that may perpetuate or exacerbate existing inequalities, threats to student privacy and data protection, the risk of over-reliance on AI at the expense of human judgment and interaction, and the potential for AI to reshape educational goals and practices in ways that may not align with broader societal values.

The urgency for establishing robust ethical governance frameworks for AI use in schools cannot be overstated. As AI technologies continue to evolve and permeate various aspects of education, from personalized learning to administrative decision-making, it is crucial to implement guidelines and oversight mechanisms that ensure the responsible and equitable deployment of these tools. Without proper governance, there is a risk of unintended consequences that could undermine the very foundations of educational equity and effectiveness.

To address these challenges effectively, there is a pressing need for further research into the long-term impacts of AI in education, particularly on student outcomes, teacher roles, and the overall learning environment. Additionally, raising awareness among all stakeholders - including educators, administrators, policymakers, parents, and students - about the potential benefits and risks of AI in education is essential. This increased understanding can foster informed discussions and decision-making processes.

Finally, comprehensive policy reform is necessary to create a regulatory environment that promotes innovation while safeguarding ethical principles. This may include developing standards for AI transparency and accountability, establishing guidelines for data use and privacy protection, and creating mechanisms for ongoing assessment and adaptation of AI systems in educational contexts. By addressing these critical areas, we can work toward harnessing the potential of AI to enhance education while mitigating its risks and ensuring that it serves the best interests of all learners.

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