

What are the Ethical Considerations to Keep in Mind When Integrating New Educational Technologies into the Classroom?: A Case Study of Artificial Intelligence

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Abstract. New educational technologies—such as artificial intelligence (AI), generative AI, and wearable monitoring devices—are profoundly reshaping classroom ecologies. While they drive greater precision, personalization, and efficiency in teaching and learning, they also give rise to multiple ethical dilemmas, including data privacy breaches, the entrenchment of algorithmic bias, the alienation of teacher-student relationships, the erosion of student agency, and the blurring of responsibility attribution. Grounded in the fundamental educational mission of "fostering virtue and cultivating persons," this paper dialectically examines four core ethical tensions arising from the integration of new educational technologies into the classroom: efficiency versus humanism, empowerment versus rights, fairness versus bias, and autonomy versus discipline. It systematically distills five overarching ethical principles—rights protection, fairness and justice, humanistic authenticity, agency cultivation, and shared responsibility—and proposes a practical pathway characterized by technology for good, ethics-first design, and multi-stakeholder governance. Finally, this paper provides a critical evaluation of the structural friction and feasibility limits of these principles, aiming to establish a robust moral foundation for the beneficial integration of technology and education within the global landscape.

Keywords: Artificial Intelligence; Educational Technology; Classroom Ethics; Ethical Principles; Educational Equity.

1. Introduction

Amid the wave of the digital technological revolution, emerging technologies such as AI, big data, and generative AI are transcending the traditional spatiotemporal and paradigmatic constraints of the classroom. Scenarios such as personalized learning recommendations, real-time learning analytics, intelligent tutoring, and automated assignment grading are becoming increasingly widespread, serving as critical pillars of educational modernization. Under technological empowerment, classroom teaching efficiency has significantly improved, the ideal of teaching students according to their aptitude has become more attainable, and the accessibility of educational resources has been enhanced, offering new possibilities for addressing long-standing challenges in traditional education. International governance bodies have recognized this potential; the Organization for Economic Co-operation and Development (OECD, 2023) emphasizes that AI can fundamentally optimize educational tracking and administrative burdens, while UNESCO's *Beijing Consensus on Artificial Intelligence and Education* (2021) explicitly calls for leveraging AI to accelerate the achievement of equitable, high-quality lifelong learning.

However, as a vehicle of instrumental rationality, the rapid penetration of technology increasingly conflicts with the value rationality inherent in education. Student learning behaviors, physiological states, and personal information are indiscriminately collected; algorithmic biases exacerbate educational inequality; emotional connections between teachers and students are weakened by data-driven interactions; independent thinking becomes standardized and disciplined; and the intertwining of technological misuse with accountability deficits gradually exposes the classroom to risks of technological alienation.

The ultimate value of education is to cultivate whole persons, not merely to pursue efficiency in knowledge transmission and data-driven indicators. Integrating new educational technologies into the

classroom is far from a simple transplantation of technology; it requires a deep integration of technology, pedagogy, and ethics. Technological applications that ignore ethical considerations will inevitably deviate from the original mission of education. Accordingly, this paper adopts a dialectical perspective, synthesizes systematic research findings from international policy frameworks and empirical literature, and conducts an in-depth analysis of the ethical tensions arising from the integration of new educational technologies into the classroom. It clarifies the core ethical principles that classroom teaching must uphold, seeks to balance technological efficacy with humanistic values, promotes the virtuous empowerment of new educational technologies, and safeguards the humanistic and moral bottom line of education.

2. Ethical Tensions in the Integration of New Educational Technologies: A Dialectical Examination

The ethical dilemmas inherent in integrating new educational technologies into the classroom stem essentially from multiple tensions between instrumental rationality and value rationality, efficiency and humanistic care, and individual rights and collective interests. Dialectically analyzing these tensions is the logical prerequisite for clarifying ethical considerations and resolving ethical predicaments.

2.1. Tension Between Efficiency Empowerment and Humanistic Alienation

Leveraging algorithms, computational power, and big data analytics, AI can efficiently perform mechanical tasks such as learning diagnostics, assignment grading, and personalized content generation, thereby significantly reducing teachers' workloads and improving classroom teaching efficiency. In theory, enhanced efficiency should free up teachers' energy to focus on value guidance and personality cultivation. However, an efficiency-driven technological logic can easily alienate the essence of the classroom: face-to-face emotional communication, intellectual exchange, and character formation are replaced by data interactions and standardized question-answer routines. Teachers risk becoming technical assistants, students become data nodes, and the classroom gradually loses its human warmth.

As Snoek et al. (2025) observed in their study of wearable attention-monitoring technology in classrooms, educational technology can dissolve genuine emotional connections by simplifying complex processes into quantifiable data flows, thereby neglecting the humanistic essence of education. Crucially, this efficiency drive reconfigures professional roles within the school ecology. Rather than liberating educators, the reliance on automated metrics often forces teachers to conform to rigid data paradigms. This directly links to the findings of Liu and Trent (2023) regarding teacher identity under Chinese education reform; they argue that when top-down digital monitoring and standardization are prioritized, teachers experience a fragmentation of their professional identities, shifting from empathetic, autonomous educators into passive managers of algorithmic compliance. This imbalance between efficiency and humanism represents the most fundamental ethical tension in the integration of new educational technologies into the classroom.

2.2. Tension Between Technological Empowerment and Rights Violation

AI applications in the classroom rely heavily on the collection of vast amounts of data, including student learning behaviors, facial expressions, attention states, personal information, and family backgrounds. While these data support precision teaching, their improper collection, storage, and use pose serious rights risks.

However, some technology applications exhibit data hegemony: data are collected without the informed consent of students or their guardians; data storage lacks encryption; usage boundaries are blurred, even leading to commercial exploitation; and wearable mental-state monitoring devices track students' attention and emotional states in real time, which amounts to quantitative discipline of students' personalities and an invasion of their mental privacy. The European Commission (2022)

notes in its ethical guidelines that the continuous monitoring of children in educational spaces risks creating chilling effects, where students suppress natural behaviors due to the omnipresence of surveillance.

Zhu et al. (2025) made this explicit in their systematic review of ethical risks in educational AI, noting that privacy violations and data misuse are the most prominent risks. These issues directly harm individual rights and violate the basic principles of educational equity, standing as a core obstacle to technology for good (Zhu et al., 2025). The premise of technological empowerment is the protection of rights. An imbalance between the two will lead technology to become a tool for infringing upon students' rights, thereby betraying the moral foundations of education.

2.3. Tension Between Promoting Equity and Entrenching Bias

Theoretically, AI can break down geographical, teacher, and resource barriers, providing high-quality teaching resources to students in remote areas and underperforming schools, thereby narrowing urban-rural, inter-school, and inter-stratum educational gaps and serving as a significant force for promoting educational equity. However, algorithmic bias and data deviations can easily solidify or even exacerbate educational inequality.

AI training data are often concentrated on students from developed regions and high-performing schools, inherently carrying biases related to region, socioeconomic status, and gender. As highlighted by UNESCO (2023) in its guidance framework, foundational models trained predominantly on high-income data parameters act as systems of cultural exclusion, projecting biases that disadvantage students from minority or marginalized socio-economic backgrounds. Consequently, algorithms may discriminate against rural students and disadvantaged groups in learning assessments and resource recommendations.

Furthermore, personalized recommendations can easily create "information cocoons". The digital divide widens as access to premium AI devices, paid resources, and technical training concentrates in economically developed areas, leaving disadvantaged students unable to enjoy the same technological benefits, thus creating a "Matthew effect" where the rich get richer and the poor poorer. The contradiction between promoting fairness and entrenching bias is a deep-seated ethical conflict that must be resolved in the intelligent-era classroom.

2.4. Tension Between Autonomy and Discipline

The integration of intelligent technologies into the classroom creates a profound tension between fostering student autonomy and enforcing digital discipline. Ostensibly, AI-driven adaptive learning systems empower student autonomy. This aligns with modern pedagogical theories that view the student as an active, self-regulating agent.

However, beneath this rhetoric of personalization lies a highly restrictive architecture of algorithmic discipline. Adaptive algorithms function by predicting the "optimal" next step for a student based on aggregate historical profiles, effectively predetermining the intellectual boundaries of the learner. Instead of cultivating genuine autonomy, this reduces learning to a process of system-guided compliance. Students are incentivized to follow the path of least resistance plotted by the machine, which curtails spontaneous curiosity, serendipitous discovery, and independent problem-solving.

Furthermore, when combined with AI-powered behavioral analytics and predictive grading systems, this dynamic transforms into a form of automated dataveillance (Selwyn, 2019). The classroom space is reconfigured into a digital panopticon where student deviations from the algorithmic norm—such as taking longer to read a passage or expressing non-standard reasoning—are flagged as deficits or behavioral non-compliance. Consequently, technology transitions from an instrument of empowerment into an agent of behavior homogenization, enforcing structural discipline while undermining the student's capacity for critical, self-determined agency.

3. Core Ethical Considerations for Integrating New Educational Technologies

Given the above dialectical examination of ethical tensions, the integration of new educational technologies into the classroom must adhere to five core ethical principles: rights priority, fairness and justice, humanistic authenticity, agency cultivation, and shared responsibility. These principles seek to balance technological efficacy with educational ethics, safeguard the educating essence of the classroom, and avoid technological alienation.

3.1. Rights Priority: Upholding Privacy Protection and Human Dignity

Rights are the bottom line of educational ethics. AI applications in the classroom must prioritize student privacy protection and human dignity, rejecting data hegemony and rights violations. First, the principle of informed consent must be strictly followed. All collection, storage, use, and sharing of student data must be disclosed in advance to students and their guardians, specifying data purposes, storage periods, and security measures. Written, explicit authorization must be obtained; unauthorized, excessive, or compulsory data collection is strictly prohibited.

Second, data security and transparency must be ensured. A classified and tiered management system for educational data should be established, distinguishing between public teaching data and private personal data. Encryption, anti-leakage, and anti-tampering technologies must be strengthened. Data usage rules and algorithmic logic should be made publicly available and subject to oversight by schools, parents, and society. Commercial exploitation and illegal data trading are strictly prohibited.

Third, human dignity and mental privacy must be respected. Technologies that involve real-time mental-state monitoring, facial expression recognition, and attention tracking—which infringe upon students' personality—should be prohibited. The use of data labels to define or judge students, as well as quantitative discipline, should be rejected to protect students' personality independence, spiritual freedom, and individual differences. As Zhu et al. (2025) emphasize, privacy protection is the primary principle of educational AI ethics, and no technological application should come at the cost of student rights.

3.2. Fairness and Justice: Mitigating Algorithmic Bias and Bridging the Digital Divide

Fairness is a core value of education. AI applications in the classroom must eliminate algorithmic bias and narrow the digital divide to prevent technology from exacerbating educational inequality. First, algorithmic bias must be eliminated. AI training data should be optimized to include diverse data on students from different regions, socioeconomic backgrounds, genders, and ethnicities, avoiding bias from single-group dominance. Mechanisms for detecting, correcting, and dynamically assessing algorithmic bias should be established to regularly verify the fairness of resource recommendations, learning assessments, and academic evaluations, eliminating discrimination based on region, gender, socioeconomic status, or ethnicity.

Second, technological resources should be equitably distributed. Governments, education authorities, and schools should increase technological investment in rural, remote, and underperforming schools, providing free access to inclusive AI teaching tools and quality digital resources, and offering teacher training in technology. This will reduce urban-rural, inter-school, and regional technological disparities, allowing all students to benefit equally from technological dividends.

Third, homogenizing discipline must be avoided. Personalized recommendations should incorporate diversity and openness, breaking down "information cocoons" by providing students with multiple learning resources and diverse intellectual perspectives. Individual differences should be respected, and students' rights to choose their own learning content and pathways should be protected, preventing algorithms from rigidifying cognition and limiting development.

3.3. Humanistic Authenticity: Safeguarding Emotional Connections

The essence of education is humanistic education. AI should always serve as an auxiliary tool in the classroom, never replacing the emotional communication, intellectual exchange, and character formation between teachers and students. The humanistic foundation must be preserved, and education must return to its original mission. First, the leading role of teachers must be upheld. AI is a teaching assistant, not the classroom leader. Teachers retain the core responsibilities of value guidance, emotional communication, intellectual inspiration, personality cultivation, and fostering innovation. Teachers must avoid becoming mere technical assistants or data operators, thereby preserving the humanistic core of education.

Second, teacher-student emotional interaction must be strengthened. AI usage scenarios should be reasonably controlled, leaving space for face-to-face communication, group discussions, classroom debates, and intellectual exchange. Teachers should be encouraged to attend to students' emotional and psychological changes, providing humanistic care and personalized guidance, repairing the alienation caused by technology, and maintaining a classroom climate of warmth.

Third, efficiency and humanism must be balanced. AI should handle mechanical, repetitive tasks such as grading, statistics, and basic question-answering, thereby freeing teachers' energy for humanistic core work such as value guidance, personality cultivation, innovative thinking development, and emotional interaction. In this way, technological efficiency and humanistic value are harmonized, preventing the classroom from becoming a cold data space.

3.4. Agency Cultivation: Breaking Technological Discipline

Cultivating students' independent personalities, critical thinking, innovative capacity, and autonomous development is the ultimate goal of education. AI in the classroom must avoid technological discipline and instead empower the growth of student agency. First, algorithm-dominated learning should be rejected, and autonomous space preserved. Standardized learning pathways and rigid evaluation models driven by algorithms should be weakened. Instead, open, flexible, and diverse learning options should be provided. Students should be encouraged to make their own learning plans and explore problems independently, thereby fostering self-regulated learning skills and a sense of independence.

Second, critical thinking must be actively cultivated. Students should be guided to view AI rationally, learn to identify algorithmic bias, information authenticity, and logical fallacies, and avoid blindly following AI conclusions or relying on AI as a substitute for thinking. The ability to question, reflect, and critique should be developed, breaking free from technological discipline.

Third, innovation and diverse development should be encouraged. AI should provide diverse inquiry tools and interdisciplinary resources, supporting students in creative learning, project-based inquiry, and interdisciplinary practice, thereby stimulating imagination, creativity, and innovative thinking. Individual differences should be respected, homogenized development avoided, and complete, independent, and innovative individuals cultivated.

3.5. Shared Responsibility: Building a Multi-Stakeholder Responsibility Community

The ethical risks of AI applications in the classroom are complex and interrelated; no single stakeholder can resolve them alone. A multi-stakeholder responsibility community—comprising governments, schools, enterprises, teachers, parents, and students—must be established, with clear responsibility boundaries and collaborative governance. At the governmental level, macro-regulations must match operational requirements. As noted in the *Framework for Digital Education Governance* (OECD, 2023), effective multi-stakeholder structures require formal feedback mechanisms where classroom data risks directly inform national tech procurement standards.

Governments must improve ethical regulations, supervision systems, and industry standards for educational AI, specifying technology application boundaries, data management standards, and algorithmic fairness requirements. Supervision of technology enterprises and schools should be

strengthened, and illegal data collection, data misuse, and algorithmic discrimination must be strictly penalized.

At the enterprise level, primary responsibility for technology ethics should be assumed. AI teaching products should be fair, transparent, secure, and inclusive. Ethics review mechanisms should be established, algorithmic logic and data usage rules disclosed, and enterprises should be subject to industry and social oversight, avoiding profit-driven technological misuse.

Schools and teachers must actively bridge the gap between policy and practice. Schools should establish ethical norms specifying use scenarios, while teachers must maintain critical oversight during real-time instruction, ensuring technology functions exclusively as a scaffold for learning rather than a substitute for governance.

3.6. Critical Evaluation: Feasibility and Inter-Principle Conflicts

It is necessary to confront a vital question: Are these five ethical principles equally achievable in practice, and can their internal conflicts be resolved simply by applying them simultaneously? A rigorous critical analysis reveals that these principles exist in a state of operational friction, presenting structural trade-offs that cannot be fully reconciled.

First, there is a fundamental conflict between efficiency empowerment and humanistic authenticity. The primary economic and operational driver for implementing AI in schools is the optimization of educational inputs—maximizing throughput via automated grading, diagnostics, and real-time metrics. However, humanistic authenticity demands unquantifiable time: slow emotional processing, unstructured dialogue, and pedagogical failures that serve as vital learning moments. Attempting to maximize both simultaneously is a structural paradox. In practice, when efficiency metrics are introduced into school performance evaluation systems, they inevitably crowd out the temporal space required for authentic human relations, as teachers are compelled to prioritize data-driven compliance over pastoral care.

Second, an unacknowledged tension exists between fairness and justice (mitigating algorithmic bias) and rights priority (privacy protection). To completely detect and eliminate algorithmic bias against marginalized student populations, developers require access to highly granular, diverse datasets that include sensitive demographic info, socio-economic tracking, and behavioral variables. However, this intensive data aggregation directly violates the core tenets of the rights priority principle, which mandates data minimization and strict boundaries around privacy. Thus, an educational system faces a catch-22: it must either compromise student privacy to construct a truly unbiased, representative algorithm, or safeguard absolute privacy at the cost of leaving hidden algorithmic biases undetected.

Finally, the five principles possess unequal feasibility due to market dynamics and institutional asymmetries. Principles like rights priority and fairness and justice can be structurally enforced through top-down legal mandates and hard technological constraints. Conversely, agency cultivation and humanistic authenticity are qualitative, highly subjective pedagogic practices. They cannot be hardcoded into an algorithm or fully regulated by policy. Because ed-tech development is predominantly monopolized by private commercial enterprises driven by profit rationalities, tools are inherently optimized for data extraction and standardization (discipline) rather than open-ended student empowerment (agency). Consequently, without a fundamental restructuring of the political economy of educational technology, a hierarchy of implementation emerges: rights and fairness will always receive structural priority due to legal compliance, while humanism and agency risk being reduced to marginalized, decorative goals.

4. Conclusion

New educational technologies such as AI are an important driving force for educational modernization, and their integration into the classroom is an irreversible trend. However, the premise of technological empowerment is adherence to ethical bottom lines and a return to the educational

mission. Integrating new educational technologies into the classroom requires a dialectical balancing of the tensions between efficiency and humanism, empowerment and rights, fairness and bias, and autonomy and discipline.

As this paper has evaluated, the five core ethical principles of rights priority, fairness and justice, humanistic authenticity, agency cultivation, and shared responsibility do not exist in a friction-free vacuum. Rather, they demand continuous, deliberate negotiation by institutional stakeholders to navigate the structural trade-offs between efficiency metrics, data privacy, and pedagogical agency.

In the intelligent era, the classroom must both embrace technological innovation, harness the advantages of technological empowerment, and promote high-quality teaching and learning development, while simultaneously guarding against technological alienation, preserving the humanistic foundation and moral bottom line of education, and adhering to the original mission of cultivating persons. Only by acknowledging these systemic tensions and establishing robust, multi-stakeholder governance frameworks can new educational technologies truly empower for good, achieving a genuine unity of technological efficacy and humanistic educational value.

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