

Ethical Considerations When Integrating New Educational Technology into the Classroom

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Abstract. With the accelerated popularisation of new educational technology across the globe, classroom teaching is undergoing a profound digital transformation. While technology empowers education, it also gives rise to ethical dilemmas including data privacy risks, educational inequity, the diminished subjectivity of teachers and students and the loss of humanistic values. Most existing studies merely describe relevant problems and lack in-depth analysis of mechanisms for reconciling conflicting values. Based on a systematic literature review, this paper establishes an ethical dilemma framework consisting of four core dimensions and further explores the logic of value conflicts behind these issues. On this basis, the paper puts forward four governance approaches, links each approach to specific ethical principles, and analyses the potential limitations of each method. The research indicates that the ethical governance of educational technology cannot rely solely on technical regulations or policy proposals. Instead, it should be built upon critical evaluation of the tensions between diverse ethical values. This paper aims to provide theoretical references to guide research on educational technology ethics to move from problem identification to value reconciliation.

Keywords: Educational Technology, Ethical Dilemmas, Value Conflicts, Governance Approaches, Critical Analysis.

1. Introduction

Digital transformation serves as a core driving force for educational reform worldwide. It improves teaching efficiency while bringing risks that may violate the fundamental norms of educational ethics [1]. Current research generally focuses on a series of major ethical hazards derived from this trend: excessive collection of student data and privacy breaches, a widening digital divide between different regions and social groups, weakened critical thinking caused by students' over-reliance on artificial intelligence tools [2], and the loss of humanistic values in education. Nevertheless, most existing studies remain at the level of descriptive discussion of problems and rarely delve into the inherent conflicts between different ethical values and corresponding mechanisms for reconciliation. For instance, inherent tensions exist between the teaching benefits brought by learning analytics technology and students' right to privacy. How to strike a reasonable balance between efficiency and individual rights still requires further exploration. Some scholars point out that the protection of privacy and the achievement of data application objectives form fundamental dilemmas in the use of educational data in the intelligent era [3]. In view of the above systematic risks and research gaps, this study integrates scattered ethical issues into four core dimensions and proposes corresponding governance approaches. Different from previous studies, this paper moves beyond simple problem identification and further evaluates conflicting ethical values, so as to provide critical and practical references for the ethical application of new educational technology.

2. Major Ethical Dilemmas of Integrating New Educational Technology into Classrooms

2.1. Ethics of Data Privacy and Information Security

Against the backdrop of the continuous development of smart classrooms, data platforms have become important supports for teaching decision-making and daily student management. When such data platforms are set as mandatory components of school curricula, ambiguous privacy policies may

leave teachers and students with a sense of powerlessness as they feel compelled to share personal data against their will, which substantially undermines the individual right to data self-determination [4].

A deeper ethical contradiction lies herein. The educational benefits of learning analytics technology, such as personalised teaching and early warning systems, are not always compatible with students' right to privacy. From the perspective of utilitarian ethics, the collection of a certain amount of data can be rational if technology improves the learning outcomes of the majority of students. Utilitarianism in applied ethics takes the overall consequences of behaviours as the criterion for moral evaluation [5]. From the perspective of rights-based ethics, however, the right to privacy is a fundamental personal right that ought not to be relinquished lightly. This contradiction is often ignored in practice. Schools and technology platforms tend to emphasise the neutrality and benefits of technology while avoiding core issues such as the boundaries of data collection authority and whether students possess genuine rights to opt out.

For students, smart classrooms capture their classroom behaviours including facial expressions, postures, real-time learning tracks and academic performance. The collected data are automatically processed to generate exclusive digital profiles and competence labels for each student. Throughout this process, students are placed in a passive position where their data are collected and their images are defined by external systems. Their personal characteristics, inner emotions and behavioural habits are simplified into cold data symbols. Such practices directly infringe upon personal privacy [6]. In addition, schools and teachers may make one-sided judgements on students' abilities and potential merely based on data labels, ignoring the complexity and individuality of young people during their growth. To resolve this contradiction, schools need to conduct ethical impact assessments before deploying relevant technology, clarify the necessary boundaries of data collection, and provide students and parents with substantial opt-out mechanisms, rather than making perfunctory statements in privacy policies.

From the perspective of schools and technology platforms, many schools lack sound data management systems. Clear regulations and authority boundaries are absent in the links of data storage, internal sharing and external transmission, which easily lead to information leakage and unauthorised use of data [7]. This demonstrates that data privacy is not merely a technical issue, but also an issue concerning institutions and power relations.

2.2. Ethics of Educational Equity and the Digital Divide

The implementation of new educational technology is highly dependent on regional economic development, school hardware facilities, household equipment and network conditions.

In terms of student groups, students in urban and economically developed regions generally have access to advanced and abundant digital curriculum resources, and can enjoy diverse services such as personalised content recommendation, virtual simulation training and artificial intelligence assisted tutoring. In contrast, students in remote areas often face the problem of outdated equipment. Girls, rural residents, people with disabilities and other marginalised groups are affected most severely [8]. They fail to receive technical teaching of equivalent quality and remain in a disadvantaged position in digital learning for a long time, eventually forming a vicious cycle where the strong grow stronger and the weak grow weaker.

In terms of teachers, the gap in digital literacy between urban and rural educators continues to widen. Urban teachers have sufficient opportunities for professional training and teaching research, so they can use intelligent tools proficiently. Rural teachers, however, are held back by inadequate infrastructure and a lack of specialised training. They often intend to use digital technology but do not know how to use them or dare not use them. Such differences in competence further widen the digital divide [9].

In terms of schools, key urban schools are generally equipped with smart classrooms and virtual laboratories, while rural schools in underdeveloped regions suffer from insufficient funds and basic digital facilities. Surveys show that by 2025, 83 per cent of rural schools have no professional

information administrators, and 76 per cent of rural teachers are deficient in the ability to apply digital teaching tools [10]. It is also worrying that the urban-rural educational gap presents a new feature: hardware facilities are gradually converging, while teachers' practical capabilities become increasingly differentiated. Improved hardware cannot deliver the expected benefits of technological empowerment due to the widening gap in teachers' digital literacy, making it difficult to realise the goal of educational equity. Some scholars argue that the theoretical foundation of technological neutrality has been widely questioned in philosophical circles. Technology is not neutral but value-laden [11]. The existence of the digital divide confirms this viewpoint. Technology does not naturally bring fairness. Its application within a specific social structure may even aggravate existing inequalities.

2.3. Ethics of Teacher and Student Subjectivity and Independent Development

The in-depth application of artificial intelligence and digital tools has completely transformed traditional learning methods and teacher-student interaction modes. This transformation, however, raises significant ethical concerns regarding human agency. It fundamentally impacts the development of teacher and student subjectivity as well as the cultivation of independent capabilities, accompanied by problems such as lazy learning and academic misconduct. The ease with which students can obtain ready-made answers through these technologies often undermines their motivation to engage in deep cognitive processing, thereby eroding the very foundations of autonomous learning and diminishing their capacity for ethical decision-making within academic contexts.

For students, various artificial intelligence platforms make it easier to complete homework and class assignments, yet they may foster a learning habit of passively receiving knowledge. Rather than acting as scaffolds for thinking, these tools frequently replace the active thinking and exploratory efforts that students ought to undertake themselves. Empirical research shows that 70.7 per cent of participants agree that the use of artificial intelligence encourages academic misconduct and weakens critical thinking. More than 50 per cent of teachers believe that students do not truly understand the content generated by artificial intelligence [12]. Students tend to copy answers provided by artificial intelligence directly as their own work and give up problem analysis, logical reasoning and independent exploration. Consequently, their capacity to exercise intellectual subjectivity and to engage in independent moral reasoning deteriorates, which in turn compromises their adherence to academic integrity and weakens their sense of intellectual responsibility. In the long run, their critical thinking, independent thinking abilities and practical inquiry awareness will gradually decline, leaving them ill-equipped to tackle novel or unstructured challenges in their future studies and careers.

For teachers, over-reliance on platform recommendations, data analysis and teaching plans generated by artificial intelligence will also weaken their teaching subjectivity. Teachers may blindly follow suggestions and logical frameworks provided by artificial intelligence, neglecting their own teaching experience, educational insights and personalised teaching designs. They gradually change from leaders of classroom teaching to executors of technical processes, losing their creativity in teaching and independent judgement in education. Such a shift not only diminishes educators' professional autonomy but also blurs the lines of accountability in pedagogical practice, as decisions derived from algorithmic outputs replace those grounded in teachers' contextual knowledge and experiential wisdom.

2.4. Ethics of Educational Values and Humanistic Care

Digital technology is introduced into classrooms to serve the fundamental goal of education. Nevertheless, many schools regard the construction of smart classrooms and hardware upgrades as ultimate objectives, leading to the phenomenon of McDonaldisation in education. This tendency reflects a broader shift in which the means of education are mistaken for its ends, and the pursuit of technological sophistication overshadows the cultivation of human potential. Teaching is measured by standards that prioritise efficiency, quantifiable results and predictable outcomes [13]. This

emphasis on efficiency and quantifiability inevitably flattens the multidimensional nature of education, reducing it to a set of measurable outcomes rather than a process of human growth. Some scholars state that value rationality and instrumental rationality fall into a state of conflict in intelligent education. This conflict is mainly reflected in the excessive pursuit of technological efficiency over respect for life, the abuse of technical means at the cost of privacy protection, and implicit algorithmic discipline that restricts creative development [14]. When efficiency becomes the overriding criterion, the distinctive human capacities for empathy, creativity and moral reflection are inevitably marginalised. Core educational values are pushed to the periphery, teaching deviates from its original purpose, and facts are artificially separated from values [15]. This separation is particularly damaging because it implies that what cannot be measured is deemed unimportant, thereby distorting the very purpose of schooling.

Meanwhile, the excessive emphasis on learning data and scores erodes the warmth of classroom education. The interpersonal interaction between teachers and students shifts from human-to-human relations to human-to-technology relations [16]. As a result, the spontaneous and affective exchanges that nurture students' character and social skills are increasingly supplanted by cold, impersonal data transactions. Excessive quantitative evaluation limits students' all-round development and ignores the emotional attributes of moral education assessment [17]. When data become the sole criterion for evaluating students, classrooms lose their due warmth. Technology is a tool rather than the ultimate solution to educational problems. Its proper use requires educators to exercise careful judgement, ensuring that data are not employed beyond their legitimate scope. This means recognising that genuine education is cultivated through empathetic dialogue, timely encouragement and respect for each student's individuality.

3. Optimised Governance Approaches

3.1. Uphold the People-oriented Original Aspiration of Education and Balance Benefits and Rights

This approach corresponds to the ethical principles of autonomy and non-maleficence. First of all, schools and educators must uphold the people-oriented original aspiration of education and clarify the primary and secondary relationship between education and technology. Researchers and practitioners in the field of education should abandon instrumentalist thinking that blindly pursues new technology, and stop regarding equipment application and upgrades as the core goal of teaching. Digital technology should only act as an auxiliary tool. For example, online courseware can be used to explain key and difficult knowledge points, and digital platforms can assist with after-class marking. All technical applications must serve students' growth and teaching progress, and the phenomenon of prioritising technology over education must be eliminated.

This approach also faces practical difficulties. In an institutional environment that emphasises teaching efficiency and management convenience, the people-oriented philosophy may be difficult to implement effectively. The real challenge lies in assessing the actual impact of technology on students' autonomy before deployment and establishing remedy mechanisms for potential harms. For example, whether schools set up ethical committees for students to file appeals, and whether technology suppliers take responsibility for algorithmic biases. If these issues are ignored, the people-oriented concept will remain nothing more than an empty idea.

3.2. Establish a Three-in-one Digital Ethics Education System Integrating Thinking, Competence and Literacy

This approach corresponds to the ethical principles of beneficence and justice. Secondly, it is essential to improve the digital literacy and ethical awareness of teachers and students and move beyond superficial skill training. Most current digital teaching training only focuses on basic operational skills such as attendance management, courseware production and homework marking, while neglecting the cultivation of digital ethics and critical thinking. Some scholars propose to build

a three-in-one literacy system covering thinking, competence and literacy in daily teaching. This system helps students develop multi-dimensional capabilities including algorithmic thinking and critical thinking to resist the alienation caused by technology [18]. Meanwhile, teachers' professional ethics in the artificial intelligence era should follow four basic principles: people-orientation, safety, fairness and beneficence. External ethical requirements should be transformed into teachers' internal and conscious professional ethics [19], so that both teachers and students refrain from blind and excessive reliance on technical templates.

It should be noted that this approach has inherent limitations. The improvement of ethical awareness is a long-term process, while technology iterates far faster than the adaptation capacity of the education system. For this reason, training alone cannot solve structural problems. Supporting institutional incentives and accountability mechanisms are also indispensable.

3.3. Regulate Classroom Data Collection and Management and Establish a Transparent Ethical Review Mechanism

This approach corresponds to the ethical principles of informed consent and data minimisation. Thirdly, authorities need to standardise the collection and management of classroom data to fully protect students' privacy and information security. The scope of student learning data collected in classrooms must be strictly controlled. Only data directly related to teaching activities, such as the accuracy rate of in-class answers, homework completion status and feedback on knowledge mastery, can be collected. Irrelevant content such as family information and personal photos of students shall not be stored arbitrarily. All collected learning data must be properly preserved, and shall not be disclosed to irrelevant personnel or used for commercial promotion and other non-educational purposes in violation of regulations, so as to effectively protect students' personal privacy.

It must be acknowledged that formalised consent procedures still exist even after data regulations are put in place. Students and parents often cannot fully understand the content of privacy clauses due to a lack of technical and legal knowledge. Therefore, a more fundamental measure is to establish independent school data ethics review committees to conduct prior reviews and post-event accountability for the introduction of all educational technologies.

3.4. Bridge the Digital Divide and Address Distributive Justice in Technological Empowerment

This approach corresponds to the ethical principles of distributive justice and equal competence. Finally, active efforts should be made to bridge the digital divide and promote the equitable distribution and universal access to high-quality digital resources. Previously, Chengdu No.7 High School shared high-quality courses and delivered cloud-based lessons to middle schools in remote towns across Sichuan Province through inter-school resource sharing. This practice enabled technological empowerment to benefit more learners.

Nevertheless, this approach has its limitations. Resource sharing does not equal equal competence. Even if schools in remote areas obtain the same curriculum resources, the marginal effects of technology will remain limited without localised teaching support and matching institutional arrangements. Therefore, bridging the digital divide cannot rely merely on resource and equipment delivery. Comprehensive governance measures including teacher training, localised curriculum reform and financial transfer payments are also required.

4. Conclusion

Through systematic sorting of ethical dilemmas arising from the integration of new educational technology into classrooms, this study constructs an analytical framework covering four core dimensions: data privacy, educational equity, teacher and student subjectivity, and humanistic care. Different from existing research, this paper moves beyond descriptive presentation of problems and further reveals value conflicts behind each dilemma, such as the tensions between the benefits of

learning analytics and students' right to privacy, as well as the opposition between the logic of technological efficiency and humanistic values in education.

On this basis, the paper puts forward four governance approaches and links each approach to specific ethical principles, including autonomy, non-maleficence, beneficence, fairness, distributive justice and equal competence. Meanwhile, the paper conducts critical reflection on the potential limitations of each approach, and points out that the governance of educational technology cannot rely merely on regulations or training. Institutional ethical review and accountability mechanisms must be embedded into the whole process.

Overall, the ethical governance of educational technology should not be regarded as a purely technical issue, but as an institutional design process that involves the reconciliation of diverse values. Future research can further explore ethical decision-making models in educational scenarios and develop operable ethical governance mechanisms at the school level.

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