Being a Teacher in the Age of AI: Between Technology, Values, and the Humanisation of Education

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Abstract

The rapid development of artificial intelligence (AI) has transformed education from a predominantly human-centred enterprise into a technologically mediated ecosystem that reshapes how knowledge is produced, distributed, and validated. This article examines the epistemological, ethical, and humanistic implications of AI's growing influence on learning environments, drawing on philosophical perspectives and critical pedagogy. AI is increasingly functioning as an epistemic actor capable of predicting outcomes, personalising learning pathways, and making automated decisions, thereby shifting educational authority away from teachers and toward algorithmic systems. This shift raises profound questions about bias, privacy, social justice, and the normative purpose of education. Through an analysis of epistemic transformation, the reconceptualization of teacher roles, and emerging ethical challenges, the article argues for a humanistic framework that resists metric reductionism and reaffirms education as a project of liberation and human dignity. Teachers are positioned not merely as technology operators but as curators of knowledge, moral mediators, and critical agents who ensure

that AI serves humane and democratic educational aims. The article concludes by offering a normative horizon for AI-integrated education and outlining future research directions for building ethically grounded, humanising educational ecosystems.

Keywords: Artificial Intelligence in Education; Epistemic Authority; Critical Pedagogy; Humanistic Education; Algorithmic Ethics

A. INTRODUCTION

The development of artificial intelligence (AI) in the early 21st century has been a catalyst for massive change in almost all aspects of human life. (Chen et al., 2020). In less than two decades, AI has transitioned from the experimental realm of laboratories to widespread applications integrated into everyday life, encompassing virtual assistants, recommendation systems, predictive analytics, and the automation of industrial and government processes. The field of education has not been spared from this trend. Learning spaces that once relied on face-to-face interaction are now coloured by adaptive learning technologies, learning analytics, and online platforms that utilize algorithms to organise content, pace, and assessment of learning.(Järvelä et al., 2023).

The history of modern education shows that the relationship between technology, knowledge, and power has always been intertwined. The invention of the printing press in the 15th century democratized access to literature and accelerated the development of mass literacy. The Industrial Revolution introduced blackboards and the mass printing of schoolbooks, which facilitated the standardisation of the curriculum. The 20th century witnessed a transformation in knowledge distribution through the use of computers and

the internet, enabling global access to learning resources and accelerating cross-border academic collaboration (Williamson & Eynon, 2020a). However, AI presents a fundamental difference: it not only distributes information but also processes data at scale, predicts learning outcomes, provides personalized recommendations, and even makes automated decisions in student assessment (Chiu & Chai, 2020), In other words, AI acts as an epistemic actor that actively shapes the direction and goals of education, rather than merely a passive tool (Selwyn, 2019).

The presence of AI raises profound philosophical and ethical questions: who determines the direction of education—humans, with their capacity for reflection and empathy, or machines, with their morally neutral yet practically powerful optimisation logic? How does the integration of this technology change the epistemological relationship between teachers, students, and knowledge itself? (Selwyn, 2019).

The potential of AI in education cannot be ignored. This technology can expand access for students in remote areas, support children with special needs, reduce teachers' administrative burdens, and personalise learning paths based on individual needs.(Holmes, Porayska-Pomsta, et al., 2021) For example, adaptive learning systems, such as Squirrel AI in China, have been used to analyse student learning patterns in real-time and provide customised materials. (Gupta & Kaul, 2024). In Indonesia, the Merdeka Mengajar platform has begun integrating data analytics to help teachers map students' competencies. (Hamsar, 2024).

However, this technical success has consequences that are not always positive. Without a clear ethical framework, AI has the potential to widen social gaps through

algorithmic bias (Baker & Hawn, 2021a). Distort the purpose of education into mere optimisation of achievement metrics (Estaiteyeh & McQuirter, 2024). And eliminate the dialogical space essential to the formation of critical awareness (Swindell & others, 2024). The case of algorithm use in national exam assessment in the UK in 2020 serves as a warning: automated assessment systems that rely on historical data actually disadvantage students from low socio-economic backgrounds, overlooking individual efforts and achievements that fall outside of statistical patterns (Estaiteyeh & McQuirter, 2024).

Theoretically, this challenge aligns with Paulo Freire's warning about the dangers of the banking model of education, in which students are treated as passive recipients of knowledge to be "filled" with information. (Freire, 1970). In the context of AI, this model could evolve into an algorithmic version in which automated systems determine learning paths without considering students' aspirations and personal contexts. (Freire, 1998). Martha Nussbaum, through the capabilities approach, emphasises that education should expand human capacities to live with dignity, empathy, and active participation in public life — goals that are difficult to achieve if learning is reduced to a series of predictive scores. (Nussbaum, 2001). Meanwhile, Gert Biesta (2017) reminds us that education should not be trapped in the "learnification" paradigm, which measures success solely by measurable learning outcomes, but should instead shape critical and socially responsible subjects

Amidst the algorithmization of education, the role of teachers is at the centre of this tension (Gupta, 2024). Teachers are not only educators, but also guardians of values, facilitators of dialogue, and moral mediators who ensure that the learning process remains humanising

(Holmes et al., 2021). However, in a digitised ecosystem, teachers' authority is increasingly fragmented (Selwyn, 2019). Algorithms claim objectivity and direct both curriculum and evaluation, while teachers are often positioned as implementers of technical recommendations (Gupta & Kaul, 2024b). This phenomenon raises an epistemological dilemma: will education continue to be guided by human values and empathy, or will it be handed over to morally neutral machine calculations that wield significant practical control?

This paper is based on three basic principles: first, education is a normative process, not value-neutral; second, the role of teachers cannot be reduced to that of technology operators; teachers are epistemic and moral actors who determine the direction of humanizing learning; third, humanistic education in the AI era requires a critical reflection framework that combines educational philosophy, critical pedagogy, and technology ethics.

Based on this principle, this article poses three main questions: (1) How does AI change the epistemological structure of education and the teacher-student relationship? (2) What are the ethical implications of the datafication and algorithmization of education for its normative goals? (3) How can education maintain and strengthen its humanistic dimensions amid the dominance of technological logic? These questions form the common thread of discussion in the following chapters, which cover an analysis of the transformation of the educational paradigm due to AI, the reconceptualisation of the role of teachers, ethical and humanisation dimensions, and a normative framework to ensure that education remains a liberating human project.

B. AI AND THE EPISTEMOLOGICAL SHIFT IN EDUCATION

The development of artificial intelligence (AI) in education is no longer merely a supporting technology that facilitates administration or accelerates the learning process. AI now acts as an epistemic actor, actively shaping how knowledge is produced, disseminated, and validated. Through machine learning and predictive analytics, AI can personalise learning paths, provide instant feedback, and predict student academic achievement. This role positions AI to influence not only the learning process but also the direction of education as a whole.

This shift moves the focus of public and academic discourse from purely practical questions—how AI can be utilised—to philosophical questions: what kind of knowledge do we want to shape, and who has the right to determine it? AI does not appear in a vacuum; it is built on historical data, algorithms coded by humans, and specific optimisation logic that reflects certain values and goals. When this logic permeates curricula, assessments, and teacher-student relationships, it quietly alters established epistemic power structures (Selwyn, 2019)

1. From Distribution Technology to Decision Technology

The history of education shows a close relationship between technological innovation and changes in the structure of knowledge. The invention of the printing press in the 15th century enabled the democratisation of text, triggered an explosion in literacy, and redefined the role of teachers as mediators of knowledge(Eisenstein, 1983). The 20th century brought computers and the internet, expanding

global access to information and opening up opportunities for cross-border academic collaboration (Castells, 2001).

However, all of these technologies act as mediators—conveying knowledge from the source to the learner without actively changing its substance. AI is fundamentally different. Through sophisticated algorithms, AI not only streams information but also processes, interprets, and decides the sequence of material, types of exercises, and forms of evaluation that students will encounter (Holmes, Bialik, et al., 2021). These decisions are often made without direct teacher intervention, and therefore AI appears as a new authority, legitimised as "data-driven" and "objective," even though the assumptions and biases inherent in algorithms are often invisible to users (Crawford, 2021)

This distinction is important because AI is no longer merely a neutral tool, but rather an entity that can systematically influence the direction of learning. The transformation from distribution technology to decision technology marks a significant epistemological shift in education.

2. Epistemological Implications

AI increasingly reshapes the learning environment by turning almost every aspect of student activity into measurable data—whether quiz scores, completion times, click patterns, or online interactions (Williamson, 2017). While this datafication makes it easier to track progress and evaluate learning efficiency, it subtly reorients education toward a positivistic mindset in which only what can be quantified appears to matter. In this process, qualities such as creativity, empathy, contextual interpretation, and aesthetic appreciation risk being sidelined simply because

they do not fit neatly into numerical categories (Biesta, 2017).

At the same time, the authority that once rested firmly in the hands of teachers and educational institutions is gradually being displaced. Where educators traditionally decided what counted as knowledge, how it should be taught, and how learning should be assessed, algorithmic systems now intervene with powerful data-driven recommendations (Selwyn, 2019). These outputs are often presented as objective or "evidence-based," which encourages uncritical acceptance even though the algorithms themselves may draw on biased social, economic, or cultural data (Benjamin, 2019). This development introduces a deeper question: within this new landscape, who truly holds epistemic authority—human educators with their capacity for moral judgment and contextual understanding, or machines whose legitimacy rests on statistical prediction?

Compounding this shift is the growing pressure for education to conform to a logic of efficiency. Faster mastery of material and higher predicted scores increasingly define what counts as success. Such expectations narrow the meaning of education to the pursuit of quantifiable outcomes, rather than cultivating whole, reflective, and ethically grounded individuals (Biesta, 2009). In this efficiency-driven environment, essential non-cognitive dimensions—such as character, practical wisdom, and critical capacity—struggle to retain their place, especially when they cannot be neatly integrated into algorithmic evaluation frameworks (Nussbaum, 2010).

3. Reviewing the Foundations of Education

This epistemological shift necessitates a reevaluation of the foundations of the educational world. AI is not a neutral technology; it carries a set of values, assumptions, and power logic that can change the orientation of education (Crawford, 2021). Therefore, the relevant question is no longer just how AI is used, but how AI affects the meaning of education itself.

If the goal of education is to shape independent, critical, and ethical individuals, then the role of AI must be placed within a clear normative framework (Nussbaum, 2010). The epistemological analysis in this chapter serves as the foundation for Chapter 3, which will discuss the reconceptualisation of teachers' roles amid algorithmic logic, and for Chapter 4, which outlines the ethical implications and strategies for maintaining the humanisation of education in the age of AI (Holmes, Bialik, et al., 2021).

C. RECONCEPTUALISING THE ROLE OF TEACHERS IN THE ERA OF ALGORITHMICIZATION

The rapid development of artificial intelligence (AI) has radically transformed the contemporary educational landscape. In increasingly digitised learning environments, AI is no longer merely a supplementary tool that assists teachers in routine tasks. Instead, it has emerged as an active epistemic agent capable of analysing vast sets of data, personalising learning trajectories, offering instantaneous feedback, and even making automated decisions in the evaluation of student performance (Holmes, Bialik et al., 2021). Such capabilities inevitably shift portions of epistemic authority—traditionally held by teachers—towards algorithmic systems that claim efficiency, precision,

and objectivity. As these systems become more integrated into everyday educational practice, they subtly influence decisions that were once the exclusive domain of human educators.

Yet this shifting authority does not signal a diminishing role for teachers. On the contrary, the rise of algorithmic logic has made the work of teachers more vital than ever. At a time when automation increasingly dictates the pace, structure, and content of learning, teachers remain the essential mediators who preserve the human core of education. Their responsibilities extend far beyond transmitting knowledge; they now embody a triadic role that is both intellectual and ethical. As curators of knowledge, teachers filter and interpret information within a digital environment saturated with unverified, decontextualised, or misleading content. As guardians of values, they ensure that educational practices reflect commitments to social justice, dignity, and inclusivity—principles that algorithms, trained on historical data and optimisation logics, are ill-equipped to uphold. As critical agents, teachers possess the moral authority to question, resist, or recalibrate algorithmic decisions that appear biased, harmful, or detached from the lived experiences of their students.

These expanded roles require competencies that far exceed the boundaries of conventional pedagogy. Teachers must now navigate a hybrid space where technological literacy intersects with ethical discernment, cultural sensitivity, and philosophical reflection. They must understand not only how AI systems function, but also how these systems embed assumptions, values, and power relations that shape educational outcomes. They must be prepared to interrogate algorithmic recommendations, advocate for equitable practices, and intervene when

automated processes risk undermining the very purpose of education.

In this era of algorithmicization, teachers are no longer positioned as passive implementers of technological tools. Instead, they stand at the forefront of a complex negotiation between human judgment and machine logic. Their role is to ensure that, amidst the allure of optimisation, education does not lose its most essential qualities: humanity, deliberation, and the ethical commitment to developing reflective, capable, and socially responsible individuals. Far from being displaced by AI, teachers are called to reassert their centrality—guiding technology rather than being guided by it, and shaping the educational horizon in ways no algorithm can replicate.

1. Knowledge Curator

The explosion of digital information has produced an almost boundless sea of knowledge, allowing students to access data, theories, and learning materials from around the world within seconds (Selwyn, 2019). Yet this abundance introduces a new challenge: navigating which information is valid, relevant, and genuinely meaningful. AI-driven systems can assist by presenting content tailored to students' preferences or ability levels through the use of learning analytics and adaptive learning technologies (Chen et al., 2020). Still, such systems operate on statistical correlations rather than moral judgment or contextual understanding. An algorithm may detect that material A frequently appears alongside material B, but it cannot discern whether the connection is historically significant, socially meaningful, or aligned with the cultural values of a particular community.

This is precisely why the role of teachers as curators of knowledge becomes indispensable. Teachers filter credible sources from the torrent of unverified information, connect knowledge to curricular goals and broader learning purposes, and provide the historical, social, and cultural contexts that allow information to become meaningful rather than remaining a mere collection of disconnected facts (Turkle, 2015). Such curatorial work depends on intuition, professional experience, and critical reflection—capacities that lie far beyond the reach of statistical logic and cannot be replicated by automated systems.

2. Guardians of Values

Education has always carried a normative dimension. Every pedagogical choice—from the selection of learning materials to the methods used to assess students—reflects a particular vision of what is considered important, worthwhile, and meaningful (Biesta, 2009). AI, despite its reputation for objectivity, is developed from datasets drawn from the real world, which are themselves shaped by social, economic, and cultural inequalities (Noble, 2018). When these systems operate without critical oversight, algorithms can inadvertently reinforce and even intensify existing patterns of injustice (Eubanks, 2018). Learning recommendation systems, for instance, may inadvertently steer students from certain backgrounds into lower educational tracks simply because of biased historical data points that steer them in that direction.

In this landscape, the teacher's role as a guardian of values becomes essential. Teachers ensure that the adoption of AI does not erode the principles of social justice, respect for diversity, and the protection of human dignity. This responsibility requires them to scrutinise algorithmic

outputs and consider their effects on vulnerable groups, to advocate for institutional policies that align the use of AI with inclusive educational aims, and to embed a social justice perspective into everyday learning. Through this approach, students are encouraged not merely to accept technological tools at face value, but to understand their broader social implications and the ethical questions they raise (Biesta, 2009).

3. Critical Agents

Amid the accelerating rise of educational technologies, the landscape of decision-making in schools is undergoing a profound transformation. Many responsibilities that once required human sensitivity, contextual judgment, and pedagogical experience are increasingly being delegated to automated systems (Holmes, Bialik et al., 2021). Algorithms now recommend learning pathways, grade assessments, identify behavioural patterns, and even flag students who are statistically predicted to be at risk of dropping out. Such developments create a seductive narrative: that data-driven systems are more efficient, more objective, and therefore more trustworthy than human educators. Yet this narrative obscures a crucial truth—that algorithmic outputs are neither neutral nor infallible, and that they often lack awareness of the personal histories, cultural backgrounds, and emotional realities that shape each learner's educational journey.

It is within this shifting landscape that teachers must embrace their role as critical agents of educational justice. This role begins with the capacity to monitor and evaluate algorithmic decisions with a discerning eye. Teachers must examine whether automated recommendations align with sound pedagogical principles, whether the metrics being

optimised genuinely serve learning, and whether the underlying data may embed biases that distort outcomes (Holmes, Bialik et al., 2021, pp. 45–48). Instead of accepting algorithmic outputs as authoritative facts, teachers must approach them as *claims*—claims that require scrutiny, interpretation, and, when necessary, contestation.

Equally important is the teacher's responsibility to intervene when technology risks producing harm. Intervention can take many forms: questioning an algorithmic prediction that labels a student as "low potential," challenging automated learning pathways that appear to limit rather than expand educational opportunities, or advocating for a re-evaluation of systems that disproportionately disadvantage specific groups (Noble, 2018). Such interventions demand moral courage, for they require teachers to assert their professional authority in spaces where technological systems are often perceived as more objective or rational. Yet courage alone is not enough; teachers also need institutional legitimacy and a supportive educational culture that recognises their ethical and pedagogical responsibilities.

In fulfilling these roles, teachers move beyond mere compliance with technological directives. They become negotiators of power in an increasingly algorithmic system. Their decisions shape how technologies are interpreted, how their recommendations are implemented, and how their limitations are acknowledged. Teachers thus operate not at the margins but at the centre of a broader struggle over who—or what—defines the goals and values of education (Selwyn, 2019). Rather than allowing technology to dictate the terms of learning, teachers assert that educational decisions must remain rooted in human judgment, empathy, and ethical reflection.

Ultimately, the presence of teachers as critical agents ensures that education does not devolve into a technocratic process governed by statistical logic. Algorithms may be adept at pattern recognition, but they cannot grasp the complexities of human growth, the unpredictability of inspiration, or the moral dimensions of teaching. By maintaining their active, reflective, and interventionist stance, teachers safeguard the humanity of education, ensuring that technology serves as a tool for empowerment rather than a mechanism of control. They are the ones who keep the educational space open—open to dialogue, to possibility, and to the kind of transformation that no system of automated prediction can ever fully capture.

4. New Teacher Competencies

To fulfil their evolving roles in the age of algorithmicisation, teachers must cultivate a set of competencies that go far beyond traditional pedagogical skills. Central to this is the development of three interrelated forms of literacy—technological, ethical, and humanistic—that together enable teachers to navigate a digitised educational ecosystem with both confidence and critical awareness.

The first of these, technological literacy, requires teachers to do far more than simply operate digital tools. They must understand the underlying mechanics of artificial intelligence, including the types of data it draws upon, the logic embedded in its models, and the limitations that shape its outputs (Holmes, Bialik et al., 2021, pp. 63–65). Such understanding enables teachers to identify potential biases, critically evaluate automated recommendations, and make informed decisions about when and how AI should be utilised to support learning. Without this deeper

comprehension, teachers risk becoming passive recipients of algorithmic advice rather than active interpreters who can guide technological decisions in pedagogically meaningful ways.

Equally essential is ethical literacy. As AI systems increasingly mediate teaching and learning, they introduce a range of moral questions that teachers must be equipped to recognise and evaluate. These include issues of data privacy, transparency, accountability, and the potential for algorithmic discrimination—challenges that have significant implications for students' rights and well-being (Floridi, 2013). Ethical literacy empowers teachers to scrutinise the moral assumptions built into technological systems, to advocate for fair and inclusive practices, and to resist forms of automation that compromise human dignity or exacerbate educational inequalities (Floridi, 2013, pp. 76–78). In this sense, teachers become ethical stewards who ensure that technological innovation aligns with the deeper values of education rather than merely reflecting the imperatives of efficiency or optimisation.

The third dimension, humanistic literacy, reminds us that education is fundamentally a relational practice. Although AI can personalise content or adapt learning pathways, it cannot replicate the emotional connections, trust, and dialogical spaces that teachers create (Turkle, 2015, pp. 192–194). Humanistic literacy emphasises the importance of cultivating warm, respectful, and supportive interactions that make students feel safe to question, explore, and take intellectual risks (Biesta, 2009, pp. 144–146). In an environment where digital tools mediate increasing portions of the learning experience, teachers must safeguard these relational dimensions to ensure that education remains a space of human growth rather than

mere cognitive optimisation. This also includes fostering critical awareness in students so that they understand not only how to use technological tools, but also how those tools shape their experiences and opportunities (Selwyn, 2019, pp. 94–96).

Reconceptualising the role of teachers in the AI era is thus not simply a response to technological developments; it is a strategic and ethical commitment to preserving education as a distinctly human endeavour (Holmes, Bialik et al., 2021, pp. 101–103). Teachers must position themselves as curators of knowledge capable of filtering information in an age of abundance, as guardians of values who protect principles of justice and inclusion, and as critical agents who can challenge algorithmic bias and resist forms of automation that undermine the integrity of education.

By mastering technological, ethical, and humanistic literacy, teachers ensure that AI becomes a partner that strengthens educational aims rather than a force that supplants human judgment (Biesta, 2009, pp. 163–165). Only through such mastery can education in the digital age continue to cultivate independent, thoughtful, and ethically grounded individuals—rather than merely producing measurable cognitive outputs that satisfy algorithmic expectations (Selwyn, 2019, pp. 110–112).

D. THE ETHICAL AND HUMANISTIC DIMENSIONS OF EDUCATION IN THE AI ERA

The emergence of AI in education has produced an impact that extends far beyond technical innovation, reaching into the normative core that has long defined the meaning and purpose of education. This technology does

more than alter how teachers teach or how students learn; it reshapes the criteria of educational success, redistributes epistemic authority, and reorients the moral foundations upon which learning practices rest. While the preceding chapters examined epistemological changes and the shifting role of teachers, the present discussion turns to the ethical challenges and humanistic responsibilities that arise within AI-mediated learning environments.

These concerns are central because AI is never a neutral instrument; it operates with embedded logics, value assumptions, and political consequences that structure educational interactions. In practice, this means that AI has the capacity to reproduce social injustice, erode privacy, and shift the focus of education away from human development toward cognitive optimisation. Ethical considerations, therefore, cannot be peripheral to discussions of AI in education—they must constitute the guiding framework for determining how such technologies are integrated and governed.

The integration of AI places contemporary education at a critical intersection between technological innovation and ethical responsibility (Holmes, Bialik et al., 2021, pp. 3–5). On one side lies the promise of efficiency, personalisation, and improved access; on the other lies the risk that education becomes increasingly technocratic, driven by quantitative indicators that overshadow the human dimensions of learning (Selwyn, 2019, pp. 110–112). Education is not merely a cognitive transaction but a formative space where character, critical thinking, and moral sensibilities are cultivated (Biesta, 2009, pp. 12–14). Algorithmic decision-making, however, often narrows educational priorities by optimising for measurable

outcomes, thereby marginalising capacities such as empathy, dialogue, and meaning-making (Chen et al., 2020).

The ethical stakes become even more pronounced when considering algorithmic bias, which reveals a long-standing philosophical tension between human judgment and computational logic. As earlier chapters demonstrated, the transfer of epistemic authority from teachers to data-driven systems is not simply a technical shift—it signals a reformulation of how truth, value, and human potential are understood in educational contexts. Algorithms trained on historically unequal datasets frequently reproduce those inequalities under the guise of neutrality (Baker & Hawn, 2021a). Predictive models may assign certain students to diminished learning trajectories or categorise them as "at risk," reflecting not their abilities but the socio-economic, racial, or gendered disparities encoded in past data (Baker & Hawn, 2021, p. 93). These outcomes expose a fundamental philosophical gap between what education is and what it ought to be in a just society (Ekeh et al., 2025).

Such tensions extend into the domain of privacy, where AI-mediated monitoring reshapes the conditions required for genuine learning. AI systems continually record students' behaviours, preferences, and emotional patterns (Holmes, Bialik et al., 2021, pp. 27–28), producing a digital architecture of visibility reminiscent of Foucault's panopticon—an omnipresent surveillance that influences conduct even without overt enforcement (Foucault, 1979). Under these conditions, students may internalise the gaze of the algorithm, moderating their behaviour, intellectual risks, and self-expression in anticipation of being evaluated (Swindell, 2024). Such self-regulation undermines the existential freedom necessary for inquiry, experimentation,

and the productive experience of error—key components of the humanistic pedagogy explored previously.

At a more structural level, the growth of algorithmic governance in schools signals a profound reorientation of educational purpose. AI operates according to predictive logic, drawing on past data to forecast and optimise future outcomes (Ekeh et al., 2025, pp. 48–49). This predictive orientation stands in contrast to the moral and teleological aims of education, which concern the cultivation of individuals capable of imagining new futures rather than reproducing existing ones (Biesta, 2009, pp. 20–21). When educational decisions are ceded to machines, schooling risks becoming an adaptive mechanism designed to integrate students into established social orders rather than challenging them (Selwyn, 2019, pp. 118–119). Freire's conception of education as a praxis of liberation underscores the danger: without a transformative vision, AI may entrench the status quo by masking historical inequalities beneath algorithmic objectivity (Freire, 1970, pp. 72–75).

To navigate these ethical challenges, an appropriate framework for AI in education must move beyond risk mitigation or technical compliance. It must confront the deeper philosophical question of what it means to educate human beings within a system increasingly shaped by computational processes (Şenocak et al., 2024). Such a framework must foreground commitments to social justice, privacy, dignity, and the irreducible diversity of learning experiences (Holmes, Bialik et al., 2021, p. 33). Moreover, it calls for sustained collaboration among educators, policymakers, technologists, and communities to ensure that AI systems reflect moral commitments rather than optimisation logics (Biesta, 2009, pp. 28–29).

Within this ethical terrain, teachers emerge as essential mediators situated between human judgment and algorithmic logic. Although AI systems can recommend pathways or identify behavioural patterns, only teachers can interpret these outputs in light of students' lived realities, aspirations, and emotional needs (Selwyn, 2019, pp. 121–123). The relational dimension of teaching—anchored in trust, empathy, and dialogue—cannot be reduced to computation or automated processes (Freire, 1970, p. 81; Biesta, 2009, pp. 34–35). Teachers preserve the dialogical, humanising dimension of education, ensuring that learning remains more than a transactional exchange within a digital system.

Philosophically, this positions teachers as custodians of education's ethical and humanistic foundations. They protect the spaces of freedom where students can question, explore, and encounter the unknown—spaces that can easily be constricted by surveillance, optimisation, and prediction (Holmes, Bialik et al., 2021, pp. 39–40). Without their principled mediation, AI risks steering education toward a technocratic orientation devoid of empathy or moral depth. Yet when grounded in values of fairness, privacy, and respect for human dignity, AI can expand educational possibilities rather than restrict them (Ekeh et al., 2025, p. 54).

In this sense, the ethical challenge posed by AI is ultimately a question of governance—not merely who controls the technology, but what moral vision directs its use. As this chapter argues, the future of education depends on our ability to place humanistic values, rather than algorithmic efficiencies, at the centre of educational transformation.

E. THE HUMANISTIC HORIZON OF EDUCATION IN THE AGE OF AI

The development of artificial intelligence (AI) in education has not only changed learning methods but also shaken the philosophical and moral foundations of education. AI has moved far beyond its role as an administrative tool or learning medium; it now functions as an epistemic actor that influences how knowledge is produced, accessed, and validated (Bachri et al., 2024). In this ecosystem, algorithms are capable of predicting academic achievement, organising learning paths, and even making evaluative decisions that were previously the exclusive domain of teachers(Gupta, 2024).

However, as outlined in previous chapters, this progress contains a paradox. On the one hand, AI opens up extraordinary opportunities: expanding access for students in remote areas, supporting personalised learning, and reducing teachers' administrative burdens (Baker & Hawn, 2021b). On the other hand, it carries serious risks: algorithmic bias that reproduces injustice, efficiency logic that ignores qualitative dimensions,(Selwyn, 2019) and a shift in knowledge authority from human interaction to machine logic (Nguyen et al., 2022). This phenomenon was evident in the case of A-level exam grading in the UK in 2020, where predictive algorithms lowered the scores of students from disadvantaged backgrounds, disregarding individual effort (Biesta, 2017b) Similarly, in China's Squirrel AI system, data-driven personalisation accelerates achievement but has the potential to lock students into predicted past behaviour, limiting exploration beyond predetermined paths (Holmes, Porayska-Pomsta, et al., 2021)

From the synthesis of the analysis in Chapters 2–4, it is clear that we are now at a conceptual crossroads. Will education surrender its direction and meaning to algorithmic calculations, or are we capable of formulating a normative horizon that guides technology toward humanitarian goals? This question is crucial because education is not merely a process of knowledge transfer, but a moral, social, and philosophical project aimed at shaping critical, ethical, and intellectually independent individuals(Williamson & Eynon, 2020b).

The humanistic horizon in AI-based education necessitates a reaffirmation of the principle of dialogue as the core of the learning process. The interaction between teachers and students cannot be reduced to an exchange of data or learning scores (Şenocak et al., 2024). It is there that empathy, curiosity, and intellectual courage to question the status quo grow. As shown in Chapter 3, teachers have a unique role as curators of knowledge, guardians of values, and critical agents (Swindell, 2024). They not only teach content, but also provide context, build humanising relationships, and intervene when algorithmic decisions conflict with the values of justice or human dignity (Freire, 1970).

The second principle of this horizon is the rejection of metric reductionism. Algorithmic logic tends to measure success through quantifiable parameters, such as test scores, speed of completing material, or percentage of competency achieved(Freire, 1970. P. 79) However, many important dimensions of education—such as creativity, imagination, the ability to weigh moral dilemmas, and the courage to take intellectual risks—cannot be measured with precision(Nussbaum, 2001). If AI is used without critical awareness, education will be trapped in a narrow paradigm

of efficiency, neglecting the essential qualities that shape a whole human being (Bachri et al., 2024).

The third principle is a commitment to social justice and diversity. As discussed in Chapter 4, algorithmic bias is not only a technical issue but also a structural one. The datasets used by AI often reflect existing social inequalities, so algorithm-based decisions tend to perpetuate and reinforce these inequalities. The humanistic horizon demands that technology be used to reduce inequality, for example, by ensuring data transparency, system accountability, and correction mechanisms that favour vulnerable groups.

To realise this normative horizon, an epistemological framework that preserves the autonomy of knowledge in human hands is needed. AI can help guide learning, but the ultimate goal must be determined through human deliberation that takes into account the values, context, and aspirations of students. Within this framework, teachers are not merely technology operators, but moral decision-makers who are capable of critiquing and, when necessary, rejecting system recommendations that are not in line with humanitarian principles.

This framework also requires an awareness that AI is not a neutral entity. Every algorithm is built on certain value assumptions that, consciously or unconsciously, form a new regime of truth, as described by Bachri and his colleagues (Bachri et al., 2024). This *regime* has the potential to shift the dialogical space into an arena of compliance with predictions, thereby limiting freedom of thought and action. It is essential to recognise this so that we do not become trapped in the illusion of technological objectivity, when, in fact, a power structure is at work behind it.

Therefore, the discourse on AI in education should not stop at technical discussions about implementation and optimisation. It must shift to the formulation of a clear normative framework: technology must be subject to ethics, not the other way around. This framework must be developed through collaboration between educators, policymakers, technology developers, and communities, so that AI truly serves the purpose of humanity.

Referring to this humanistic horizon, we can imagine an AI-based education model that does not lock students into past patterns, but opens up space for new exploration; that does not only pursue measurable achievements, but also cultivates immeasurable qualities that shape critical and empathetic individuals; and that does not eliminate teachers, but strengthens their position as mediators of ethics and guarantors of the quality of learning experiences.

Ultimately, the fundamental question is not "How sophisticated can AI be in helping us learn?" but rather "Does AI help us become more complete human beings?" This question places human dignity at the centre of every educational innovation. If AI is used with a humanistic horizon in mind, it can become a partner that expands freedom and enriches the meaning of education. But if it is allowed to operate solely based on efficiency and prediction, it will erode the essence of education as a project of liberation.

The humanistic horizon in the AI era is not an abstract ideal, but rather a moral compass that must be held fast amid the rapid flow of innovation. This compass reminds us that technology is only a means; it is humans who determine the ends. Education based on this principle will be able to harness the power of AI to expand human

capacity, maintain social justice, and preserve a humanising space for dialogue. Without it, education risks losing its spirit, becoming merely a technocratic mechanism that obeys machine calculations, yet lacks empathy and meaning.

F. CONCLUSION AND FUTURE DIRECTIONS FOR EDUCATION IN THE AI ERA

This article arises from both academic concerns and a sense of moral responsibility regarding the growing integration of artificial intelligence (AI) in the educational landscape. From the outset, it has been clear that AI is not merely a pedagogical instrument but an epistemic actor capable of reshaping the orientation, structure, and values of education itself. Its presence invites a fundamental question: Can education preserve its identity as a project of humanisation and liberation, or will it gradually be reduced to a technocratic mechanism governed by the logic of prediction, optimisation, and efficiency?

The opening chapters outlined three interrelated domains that shape the future direction of this question. The first pertains to the epistemological shifts occurring within the field of education. Here, some of the authority traditionally held by teachers and academic communities has migrated toward algorithmic systems that operate on data models and historical patterns. This shift has generated a new regime of truth, in which the legitimacy of knowledge is increasingly measured not through dialogue, context, and critical questioning—hallmarks of a humanistic education—but through the accuracy and efficiency of computational predictions.

The second domain concerns the reconceptualisation of teaching itself in the era of algorithmisation. Teachers can

no longer be understood merely as conveyors of knowledge. Instead, they are called to be curators of knowledge, guardians of ethical values, and critical agents capable of assessing, filtering, and—when necessary—rejecting algorithmic recommendations that conflict with the normative aims of education. These responsibilities demand not only pedagogical expertise but also technological, ethical, and humanistic literacies that far exceed conventional competencies.

The third domain encompasses the ethical challenges and humanistic imperatives that arise from the widespread use of AI. As explored earlier, algorithmic bias, intrusive data surveillance, and the logic of efficiency all pose serious threats to the freedom, diversity, and moral depth of the learning experience. Without a robust ethical framework grounded in social justice, human dignity, and respect for the plurality of learning experiences, technology risks becoming an instrument of control—reducing human beings to objects of measurement and optimisation rather than recognising them as subjects of agency, creativity, and moral worth.

Against this background, Chapter 5 articulated a humanistic horizon as a normative guide for the use of AI in education. This horizon reaffirms that education must remain dialogical, must reject metric reductionism, and must remain committed to social justice. In this view, AI must always be subordinated to human values. When guided by such a horizon, technology becomes not a constraint but a catalyst—expanding freedom of thought, enriching dialogue, and supporting the formation of empathetic, critical, and ethically grounded individuals.

From these reflections arises a central philosophical insight: AI is never neutral. It always operates within value

frameworks, whether explicit or implicit. For this reason, the task of education in the AI era is not simply to adopt technologies rapidly or efficiently but to shape their development and usage through deep ethical deliberation. Education as a space of liberation requires the courage to move beyond algorithmic prediction and to resist the reduction of human learning to patterns of data. If AI is deployed without a moral compass, it risks producing a generation that is compliant, efficient, and predictable—but lacking the ability to question, imagine, and take responsibility for shaping their future. Yet, if anchored in a humanistic vision, AI can support the expansion of human capacities, enabling each learner to live with dignity, empathy, and active participation in public life.

These reflections naturally open a pathway toward future inquiry. Several urgent agendas emerge from this discussion. First, there is a need to develop a theory of critical AI pedagogy that integrates technical understanding with ethical and political analysis. Interdisciplinary studies are also necessary to examine the epistemological implications of algorithmization for learning and knowledge. A globally binding ethical framework for AI in education is increasingly indispensable, not only to ensure responsible design but also to protect learners across diverse cultural and social contexts. Finally, strengthening the role of teachers as critical agents—through sustained development of technological, ethical, and humanistic literacies—must become a central priority for educational institutions worldwide.

Amid the euphoria surrounding AI's potential, we must remain anchored in the deeper purpose of education. Education is not merely about optimising knowledge input and output; it is a space for shaping individuals capable of

thinking, feeling, and acting with reflection and integrity. No matter how sophisticated technology becomes, it can only serve this purpose if it is guided by a clear moral vision. Thus, the greatest challenge before us is not to create smarter machines but to ensure that the machines we create help cultivate wiser humans. Only with a normative horizon rooted in liberation, justice, and human dignity—and supported by epistemological and ethical frameworks that remain critical of technological power—can education remain a genuine space for humanisation in the age of AI.

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