

Potential Dangers of AI in Teaching: An Ecological Analysis of Teacher Agency

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Abstract. Drawing on Priestley, Biesta, and Robinson's ecological approach to teacher agency, and on Biesta and Tedder's account of agency as an ecological achievement, this paper defines teacher agency not as a personal trait but as something achieved through the interaction of past experience, future orientation, present judgement, and contextual conditions. The paper argues that AI should be understood not merely as a teaching tool, but as an ecological force that can reorganize the material, cultural, structural, and relational conditions of teaching. It identifies three major risks: the displacement of pedagogical judgement, the strengthening of algorithmic authority and performativity, and the weakening of relational responsibility. The paper concludes by proposing ecological mitigation strategies, including preserving final pedagogical authority, ensuring explainability and contestability, adopting anti-surveillance safeguards, developing critical AI literacy, and rebuilding collective professional conditions for teacher agency.

Keywords: Teacher agency; artificial intelligence in education; relational responsibility.

1. Introduction

Artificial intelligence now enters teaching through lesson-planning assistants, automated feedback tools, predictive analytics, AI tutors, generative writing systems, and semi-automated assessment. UNESCO's [1] guidance argues that AI may support teaching and learning, yet they also emphasize that rapid development has outpaced governance and raised significant ethical and educational risks. Much public discussion focuses on technical failures – AI hallucinations, biased recommendations, plagiarism, or student privacy violations [2, 3]. These are serious problems, but they do not fully capture what is at stake educationally. Teaching is not only the transmission of accurate information; it involves reading situations, interpreting students, balancing competing educational goals, and deciding what should be done in a particular context. A tool may therefore be technically useful and still be educationally dangerous if it reorganizes how judgment is made [2, 3].

This essay argues that the deeper danger of AI in teaching lies in its potential to reconfigure the ecology of teacher agency. Priestley, Biesta, and Robinson's ecological approach is especially helpful here because it does not treat agency as an individual possession [4]. Instead, it understands agency as something teachers achieve through the interplay of experience, aspiration, present judgment, and contextual conditions. Once that framework is adopted, AI becomes significant not merely because it can perform tasks, but because it may reshape the conditions through which teachers decide, act, and take responsibility [4].

2. Defining Teacher Agency

2.1. Beyond Individual Capacity

Teacher agency is often colloquially described as confidence, autonomy, motivation, or willingness to innovate. Such accounts are too narrow because they imply that when educational change stalls, the problem lies mainly in teachers' personal deficits. Priestley et al. [4] explicitly reject this individualistic reading. They emphasize that teacher agency should be understood not only in terms of individual capacity, but also in relation to the cultures and structures of schooling. In other words, the question is not only what a teacher is like, but also what conditions make meaningful action possible. This matters because a highly skilled teacher may have little agency in an

environment dominated by rigid scripts, narrow accountability pressures, or mandatory platforms. Conversely, an otherwise unexceptional teacher may act very agentically in a setting that values trust, collegiality, experimentation, and contextual discretion. Teacher agency is therefore better defined as the achieved capacity to act purposefully and educationally well within a particular ecology of practice, rather than as a stable inner trait [4].

2.2. Agency as Temporal and Ecological

The ecological account of teacher agency also has a temporal dimension. Emirbayer and Mische [5] define agency as a temporally embedded process of social engagement. They distinguish three dimensions: the iterational, the projective, and the practical-evaluative. The iterational dimension refers to the past: teachers draw on professional memory, prior experience, habits, beliefs, and identity. The projective dimension refers to the future: teachers imagine possible futures, form aspirations for students, and orient their work toward educational purposes. The practical-evaluative dimension refers to the present: teachers make situated judgements under actual constraints.

These three dimensions are especially useful for understanding teaching. Teachers do not act as detached technicians. They interpret situations through previous experience, professional values, and hopes for students. They also work in conditions of uncertainty, where there is rarely one correct solution. A teacher deciding how to respond to a disengaged student, how to adapt a task, or how to interpret a piece of writing must weigh several possibilities at once. Such judgement is not mechanical. It is practical, ethical, and contextual.

Biesta and Tedder's [6] ecological account extends this view by emphasizing that agency is enabled or constrained by the surrounding ecology. Time, trust, collegial relationships, curriculum flexibility, assessment policy, leadership, and available resources all shape whether teachers can act in meaningful ways. Agency, in this view, is not simply "freedom from control." It is the achieved capacity to act purposefully and educationally well within particular circumstances. This formulation is especially helpful for AI because AI does not merely add a new tool to the classroom. It can alter the circumstances under which teachers remember, imagine, judge, and act.

2.3. Material, Cultural, Structural, and Relational Conditions

For analyzing AI's impact, four ecological conditions are especially useful. Material conditions include tools, time, data systems, interfaces, and infrastructure. Cultural conditions include values and discourses about what counts as good teaching. Structural conditions include policies, accountability rules, procurement decisions, and organizational hierarchy. Relational conditions include the teacher's connections with students, colleagues, leaders, and families. These are not separate layers added after the fact; they jointly shape whether teacher agency can be achieved [4].

AI does not merely help teachers complete isolated tasks. It can alter all four conditions simultaneously. It changes how materials are produced (material), what forms of evidence are privileged (cultural), what structures regulate work (structural), and how educational relationships are mediated (relational). If teacher agency is ecological, then the educational significance of AI lies in how it reshapes those conditions [4].

3. AI as an Ecological Force

AI is often framed as a neutral aid that teachers may choose to use or ignore. That underestimates its power. UNESCO's policy guidance explicitly uses human-centered language and stresses that AI in education must protect human agency, inclusion, and equity [1]. Recent policy and research discussions similarly show that AI is not just a classroom convenience but part of a wider reconfiguration of educational systems, affecting not only learning tools but also pedagogy, teacher roles, governance, accountability, and the purposes of education [1, 2].

Kasneci et al. [3] note teacher-facing uses such as lesson planning, personalized content creation, assessment support, and professional development; they also insist that these systems require critical

literacies, fact-checking, and human supervision. AI therefore changes not only what teachers can do but also what institutions expect them to do, and how quickly. In practice, teachers may find that tasks previously seen as pedagogical now come with an implicit demand for efficiency and scalability.

4. Potential Dangers

4.1. Displacement of Pedagogical Judgment

The first danger is the displacement of pedagogical judgment. In the ecological framework, teacher agency depends on practical-evaluative judgment: choosing among alternatives in response to the complexities of the present. AI threatens this when its output becomes the default starting point for teaching decisions. Kasneci et al. [3] explicitly argue that large language models can support planning, feedback, assessment, and professional learning, but they insist that these systems require continuous human oversight and fact-checking. The issue is not merely that AI offers suggestions; it is that suggestions can become defaults. Once judgment begins with the system and ends with teacher approval, the teacher risks becoming a validator of algorithmic output rather than the primary author of pedagogical action. A concrete example can be found in Farrokhnia et al.'s [7] study comparing teacher feedback and GenAI feedback on students' argumentative essay revisions. In this randomized experiment, 70 students revised essays after receiving either teacher feedback, zero-shot ChatGPT feedback, or chain-of-thought ChatGPT feedback. The study found that chain-of-thought GenAI feedback was rated as higher quality than both zero-shot AI feedback and teacher feedback. However, higher feedback quality did not lead to significantly greater improvement in students' revisions. Teacher feedback, although rated lower in quality, produced comparable gains in essay quality. This example shows that pedagogical judgement cannot be reduced to the production of technically strong feedback. What matters educationally is how feedback is interpreted, taken up, and transformed into learning action. From an ecological perspective, AI may assist feedback provision, but teachers remain crucial in translating feedback into meaningful pedagogical support.

4.2. Algorithmic Authority and Performativity

The second danger is the rise of algorithmic authority and the intensification of performativity. Holmes et al. [2] point out that AI in education raises key issues of fairness, accountability, transparency, autonomy, agency, and inclusion. Nguyen et al. [8] similarly argues that AI ethics in education must address data governance, autonomy, oversight, and stakeholder responsibility. These concerns become especially serious when AI systems are connected with dashboards, predictive analytics, monitoring tools, or comparative metrics. In such contexts, the meaning of "good teaching" may gradually shift toward what is easily measured and displayed. Teachers may then feel pressured to teach for the indicators rather than the full complexity of students' educational needs.

The core problem is not only datafication, but also a cultural and structural redefinition of teaching. Culturally, good teaching may become associated with visible, immediate, and comparable forms of evidence. Structurally, dashboards and predictive systems may gain institutional authority when they are linked to appraisal, monitoring, or internal comparison. Teacher agency is especially constrained here in its projective dimension. Instead of imagining students' broader growth, responsible action, and capacity for thought, teachers may be pushed to focus on improving platform-defined indicators. The future horizon of teaching is therefore narrowed from educational purposes to metric optimization.

Biesta's [9] account of qualification, socialization, and subjectification helps clarify what is at stake. AI dashboards and performance systems usually strengthen qualification first, because scores, completion rates, mastery levels, and predicted outcomes are easiest to quantify. However, education also involves socialization, through which students learn to participate with others, and subjectification, through which students become subjects of their own lives rather than objects of intervention. Once teachers organize teaching mainly around measurable indicators, these less measurable purposes can be pushed to the margins.

Tang and Wang's [10] study of AIGC-enhanced learning analytics in Chinese film education illustrates this risk. Their research combined learning analytics data from 508 students, interviews with 10 film educators, and analysis of student films. The study showed that teachers experienced tensions between empowerment and deskilling, and between efficiency and creative depth. This example suggests that data-driven AI systems do not merely provide neutral support. They can reshape what teachers attend to, what counts as evidence, and how educational decisions are justified. In Biesta's terms, such systems may strengthen measurable qualification while making subjectification and creative agency harder to protect.

4.3. Weakening of Relational Responsibility

The third danger is the weakening of relational responsibility. The ethics of AI in education cannot be reduced to data and algorithms. It must also include the ethics of education itself, including pedagogy, teacher roles, and power relations. Teaching is not only about providing help efficiently. It also involves tact, attentiveness, recognition, encouragement, and a sense of responsibility for how one responds to another person. AI systems are weak in these subtle relational tasks. Holmes et al. [2] argue that the ethics of AI in education must address not only fairness, transparency, and accountability, but also autonomy, agency, inclusion, pedagogy, and the quality of education. Similarly, Nguyen et al. [8] identify autonomy, transparency, accountability, privacy, and stakeholder responsibility as central ethical principles for AI in education. These frameworks suggest that good educational AI cannot be judged only by efficiency or technical accuracy. It must also be assessed in terms of whether it preserves the moral and relational conditions of teaching. Therefore, the danger is not only replacement, but also thinking AI may leave teachers formally present while hollowing out the relational substance of their work.

The consequences also extend to students. Darvishi et al. [11] found that students often become dependent on AI rather than learning to act more autonomously through AI. Read alongside broader ethical concerns about autonomy and agency in AI-supported education, this finding makes the relational risk clearer. Once teachers' judgement and relational support are increasingly delegated to AI, students may gradually become used to seeking answers, direction, comfort, and evaluation from algorithms. As a result, student agencies may decline together with teacher agency. Teachers become less able to exercise relational judgement, while students have fewer opportunities to practise self-regulation and independent judgement. The shared relational space that should cultivate educational agency may therefore become increasingly hollowed out.

5. Mitigations

5.1. Preserve Final Pedagogical Authority

The first mitigation principle is that AI must remain advisory, not authoritative. "Human-in-the-loop" review in education should mean more than a teacher's final click after the system has framed the problem and proposed a solution. Teachers must retain substantive authority to accept, reject, modify, or override AI outputs on pedagogical grounds. UNESCO's policy guidance and generative-AI framework both emphasize human-centered governance and the protection of human agency; those commitments need to be translated into school-level decision rules [1]. Farrokhnia et al.'s [7] comparison of teacher and GenAI feedback shows that even when AI-generated feedback is rated highly, teachers remain necessary for helping students interpret and apply feedback meaningfully.

5.2. Make AI Explainable and Contestable

Second, AI outputs should be explainable and contestable. Holmes et al. [2] and Nguyen et al. [8] both identify transparency and accountability as core ethical concerns. For teachers, opacity directly undermines professional judgment. If a system flags a student or proposes an intervention, educators need to know what data were used and why. Contestability is equally vital: teachers must be able to challenge system outputs without being treated as less objective than the platform. In short, AI should

not produce inscrutable verdicts. Ribeiro et al.'s [12] work on explainable machine learning shows that explanations help users decide when a model's prediction should or should not be trusted, which is directly relevant when teachers are asked to act on AI-generated recommendations.

5.3. Adopt Anti-Surveillance Safeguards

Third, AI deployment should be bound by anti-surveillance rules. UNESCO [1] warns that AI in education raises privacy, accountability, governance, and oversight concerns. Schools should therefore prohibit the use of AI-generated metrics for simplistic ranking, punitive monitoring, or crude productivity audits. Data collection should be proportionate and educationally justified, and procurement decisions should be guided by pedagogical goals rather than managerial priorities. In short, avoid turning schools into testbeds for surveillance technologies.

5.4. Develop Critical AI Literacy

Fourth, teacher preparation should cultivate critical AI literacy rather than narrow tool fluency. UNESCO's AI competency framework for teachers identifies a human-centred mindset, ethics, AI foundations, pedagogy, and professional development as key areas of competence [1]. That is exactly the right orientation. Teachers need to learn not only how to operate systems, but how to question their assumptions, identify bias and brittleness, protect student data, and decide when educational judgment should not be delegated. In practice, this means training that covers the socio-technical underpinnings of AI, not just button-pressing tutorials.

5.5. Build Collective Conditions for Agency

Finally, mitigation must remain ecological. Training individual teachers is not enough if school cultures still reward compliance with platform outputs or if structures allow no time for deliberation. Teachers need collaborative spaces in which AI-enabled practices can be discussed, tested, and challenged. Procurement should involve teachers as stakeholders, not just administrators. Governance should clarify responsibility so that it is not always placed unfairly on teachers. Workload policy should create time for professional review and reflection, rather than assuming that every "efficiency gain" can be converted into more deliverables. Protecting teacher agency requires institutional as well as individual measures. Holstein et al.'s [13] co-design study of a real-time classroom orchestration tool shows that AI-supported teaching systems are more educationally useful when teachers participate in their design, interpretation, and classroom adaptation.

6. Conclusion

The potential dangers of AI in teaching are not merely technical failures or ethical controversies, but ecological threats to teacher agency. Using the ecological approach as a framework, this paper has shown how AI can reconfigure the material, cultural, structural, and relational conditions of teaching, and has identified three key dangers: (1) the displacement of pedagogical judgement, (2) the rise of algorithmic authority and performativity, and (3) the weakening of relational responsibility.

These dangers do not mean that AI has no place in education. Rather, they highlight that the value of AI depends on how it is integrated into teaching. AI can support teaching by expanding resources and reducing burdensome work, but this is only possible when it enhances rather than dominates teachers' work. Therefore, mitigation strategies must focus on preserving final pedagogical authority, ensuring explainability and contestability, preventing surveillance-oriented uses, and strengthening critical AI literacy. Ultimately, the question is not whether AI should be used in teaching, but under what conditions it should be used. AI should never create a "teacher-proof" classroom; instead, it should strengthen teachers' capacity to do what they do best.

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