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Autoría ditelliana: Narodowski, Mariano (*Universidad Torcuato Di Tella. Escuela de Gobierno*)

ORCID: <https://orcid.org/0000-0002-3122-052X>

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Teaching without Teachers?

Automation, Education, and the Edge of the Human

Mariano Narodowski

Universidad Torcuato Di Tella, Escuela de Gobierno, Área de Educación

Figuerola Alcorta 7350

(1425) Buenos Aires

Argentina

mnarodowski@utdt.edu

<https://orcid.org/0000-0002-3122-052X>

Abstract

This article explores the possibility and plausibility of fully automating teaching within the structural dynamics of accelerated capitalism. Departing from normative or ethical debates about whether automation in education is desirable, it advances a theoretical hypothesis termed *strong techno-automatism*, grounded in two main claims. First, drawing on the Church–Turing thesis, it posits that the cognitive and metacognitive functions involved in teaching can, in principle, be formalized and executed by computational systems, without replicating human consciousness or subjective experience. Second, it argues that such automation does not require pedagogical policy as a driving force, but rather emerges as an endogenous trajectory of capitalist acceleration, which systematically replaces human labor with more efficient machinic couplings.

The paper reframes teaching not as a transcendent human act but as an evolutionarily adaptive, socially mediated, and historically technologized function, whose progressive exteriorization enables its technical abstraction and potential computability. While acknowledging current technological, symbolic, and biopolitical obstacles to full automation -such as emotional labor, institutional inertia, and the custodial role of schooling- the article contends that none of these constitutes a definitive ontological barrier.

In dialogue with postdigital and posthumanist thought, the analysis suggests that teaching is undergoing a material reconfiguration: from a subject-centered, embodied activity to a distributed architecture of learning operations involving both human and non-human agents. The question is no longer whether machines can teach better than humans, but how education will be reorganized once it no longer depends entirely on human agency.

Keywords: Teaching automation, Accelerated capitalism, Postdigital education, , Posthumanism, Educational technology, Cultural evolution

Introduction

Is it possible to automate teaching? For decades, this question belonged exclusively to the realms of science fiction and narrowly defined projects in instructional engineering. Today, it has become central. In contemporary debates surrounding artificial intelligence and education, positions proliferate along a spectrum ranging from enthusiastic celebration of adaptive technologies to the defense of the irreducibly human nature of teaching. Yet both technophilic and humanist perspectives often share a common assumption: that teaching is, ultimately, a practice whose meaning is grounded in the human.

This article adopts an accelerationist and posthumanist perspective (Berardi, 2011), bringing together philosophy of technology, critical theory, and the sociology of education. It does not seek to assess whether the automation of teaching is normatively desirable, but to examine the conditions under which it becomes technically possible and structurally probable within the logic of contemporary capitalism. Grounded in speculative realism (Roden, 2014), this approach articulates computability and capitalist development in relation to the evolutionary history of knowledge transmission technologies.

The argument, which I refer to as *strong techno-automatism*, is based on two core theses. The first, grounded in the Church–Turing thesis (Copeland, 2023), holds that all teaching functions understood as intellectual operations can, in principle, be formalized, modeled, and absorbed by computational systems, without the need to replicate human consciousness or subjective experience. The second, based on authors who critically reinterpret the expanded reproduction of capital through a lens impermeable to the metaphysics of value theory (Schumpeter, 2013; Caffentzis, 2013; Land, 2011), argues that automation does not require educational policy as a human-driven vector, but rather emerges as an endogenous process within capitalist acceleration, whose logic is to progressively replace human labor with more efficient machinic couplings.

The theoretical approach adopted here does not seek to analyze the side effects of automation (such as labor precarity, algorithmic bias, or the erosion of teacher agency), but rather to interrogate the structural determinants that render the automation of teaching a probable and in some respects already ongoing trajectory. It challenges the notion that the social, symbolic, or affective functions of teachers constitute ontological limits; instead, these are viewed as contingent political and ideological barriers. From this perspective, the human is not a natural boundary of the educational process but a functional residue whose centrality can be reconfigured.

It must be clarified that this study does not advocate for a society without schools (Illich, 1974), nor does it embrace the accelerationist flow of the future (Land, 2011), not out of political or moral commitment, but as a framework for situating thought about schooling and education. Following the invitation to dialogue offered by postdigital thought (Jandrić, MacKenzie, & Knox, 2024), the article argues that automation should not be understood as mere technical substitution, but as a transformation of the very conditions of agency, meaning, and relationality that structure the act of teaching.

From this perspective, a posthumanist alternative is proposed in which the key question is no longer whether teachers will be replaced, but what forms teaching will take once it no longer depends entirely on human subjects. In this scenario, the article invites us to reconceptualize education as a distributed relational practice in which human and non-human systems co-produce knowledge, affect, and emergent forms of educational agency. To sustain this hypothesis, it is necessary to take a step back and conceptually define what we mean by teaching, beyond its current institutionalized, school-based form.

Evolution, Teaching, and Technology

Before addressing the question of automation, it is necessary to clarify what we mean by *teaching*. Far from being an immaterial, essential, or transcendent capacity, teaching is an evolutionary trait of the *Homo* genus, shared only with a few non-human animals.

Recent research has shown that, rather than being an ethical gesture, a moral event, or a political choice, teaching is an adaptive skill of *Homo sapiens*, inscribed in its biological evolution (Tomasello, 2019; Csibra & Gergely, 2009). This capacity has always been expressed through technologies: some embedded in the biological apparatus, such as orality, ostension, or deferred imitation; and others involving *embonages* (De Landa, 2021), or assemblages, with the natural, social, and culturally constructed environment such as writing, printing, and the state-regulated school. From this perspective, teaching is not an emancipatory act, but an evolutionary function tied to collective survival. “Cultural evolution” (Hayes, 2018) refers to the intergenerational accumulation of knowledge as it becomes entangled with environmental conditions and genetic capital. Pioneering studies by Strauss, Calero, and Sigman (2014) have shown that humans are born with a form of “natural pedagogy,” observable even in one-year-old infants.

Research has further demonstrated that teaching is not reducible to the transmission of information. It involves the deliberate design of learning situations, adaptation to the learner’s level, and an explicit intention to modify the learner’s knowledge (Strauss, Calero & Sigman, 2014; Brandl, Mace & Heyes, 2023). This capacity has been essential for the survival of human groups, enabling the cumulative transmission of knowledge across generations.

Teaching, therefore, is a socially mediated and increasingly codified technology of cultural transmission. One particular form of this is schooling technology, a relatively recent invention whose mass universalization began in the nineteenth century (Paglayan, 2024). The components of this technology such as simultaneous instruction, standardized curricula, the adult as a locus of legitimate knowledge, and the school textbook are historical constructs that transformed teaching into a function that is delegable, reproducible, and standardizable under a regime of state-led governmentality (Foucault, 2008). Conceived as a technology (Behrent, 2013), the school enables the articulation of power and knowledge over bodies, specifically through practices and discourses related to teaching.

This evolutionary basis supports the hypothesis of strong techno-automatism. What the studies reveal is that teaching operates through observable patterns of communication, intentionality, metacognition, and adaptation—patterns that can, under adequate technical

conditions, be formalized. In other words, its evolutionary character reveals from the outset a technological plasticity that overrides any assumed irreducibility to the human, and explains its historical development as a functional process—hence, one that is porous to its environment, like any other technology.

Thus, the history of teaching can be read as a sequence of successive and overlapping forms of technical exteriorization. In oral communities, knowledge was transmitted through narration, repetition, and demonstration. With the invention of writing, the process was partially detached from the teacher's body, allowing content to be recorded, replicated, and consulted—marking the first teaching technology that did not require direct human contact. The printing press further amplified this process, radically transforming the conditions of access to knowledge. As Walter Ong (2013) notes, these technological shifts were never neutral: each medium also reshaped the experience of learning.

The emergence of modern schooling introduced a new form of technologization—of time, space, and bodies (Foucault, 2014). The classroom, the timetable, age-grouping, the curriculum, and assessment are all devices designed to ensure the orderly, efficient, and mass transmission of knowledge. At this point, a decisive rupture occurs: teaching becomes detached from one-to-one or small-group interactions—typical of *sapiens* for millennia—and is transformed into a one-to-many technology, and eventually many-to-many, as found in modern educational systems. While teaching has always been “massive” insofar as human survival depended on it, with the advent of schooling technology, massification becomes governmentalized through its centralization in state bureaucracies, and thus susceptible to standardization, control, replication, and optimization.

This process was driven by demographic and political factors, particularly by the need to produce social cohesion through centralized control (Paglayan, 2024), within a broader pursuit of technical efficiency. A single teacher facing a large group, a common curriculum, a replicable evaluative model, an architectural core reproducible across thousands of schools worldwide—all these aim to maximize the transmission of knowledge from central authorities to the most remote peripheries. From this perspective, the school can be understood as an early technology of partial automation of teaching: predigital, yet animated by the same logic of human energy optimization for scalability and control.

The proliferation of digital platforms, personalization algorithms, and artificial intelligence systems applied to education marks a new phase in this history. As shown by the classic works of Ong (2013), McLuhan (1962), and Eisenstein (1980), each medium transforms the relationship between knowledge and subject. In this case, digital environments do not merely mediate teaching—they enable its abstraction, tracking, and automation, transforming previously situated and human interactions into data, patterns, and computable flows.

In this framework, teaching—once anchored in the human body and face-to-face (and later massified) interactions—has gradually been displaced toward new supports. What is new today is not the displacement itself, but the complexity, speed, and operational autonomy it has acquired.

For this reason, asking whether teaching can be automated in terms of human energy savings requires recognizing that it always has been, at least partially. What distinguishes the current moment is that automation now targets not just the media of transmission (carved stones, printed books, schools), but the functions of the agent who teaches. The core question is no longer whether machines can teach “better” or “worse” than human teachers, but whether they can provide a more efficient substitute for the school in delivering knowledge at scale.

To understand this phase, it is essential to examine under what conditions a function like teaching can be formalized and computed. In this regard, the work of Alan Turing provides a decisive theoretical framework.

Teaching as a Computable Function

Alan Turing (1936) began with the premise that any rule-governed process can be reproduced by a machine. This is the basis of the Church–Turing thesis, which holds that any function computable through an effective procedure can be executed by a Turing machine (Copeland, 2023).

Although Turing is primarily known for formulating the concept of the universal machine and laying the foundations of modern computability theory, his thinking extends beyond mere calculation. In his writings, one finds a speculative intuition: that certain processes traditionally regarded as “un-automatable” might, over time, be absorbed by dynamic computational architectures. This idea supports the hypothesis of strong techn-automatism insofar as it challenges the presumed irreducibility of the human as a technical limit.

This thesis has been extensively debated with regard to both its scope and its limitations. While its original formulation was confined to mathematical functions, some scholars have proposed empirical extensions or “amplified theses,” suggesting that any rationalizable human behavior could, in principle, be simulated by an appropriate computational architecture (Wiedermann & van Leeuwen, 2024). Gurevich (2019), however, has challenged this extrapolation, arguing that not all effective processes can be reduced to classical computation, especially in complex and open-ended human contexts.

Bang and Nieh (2022) have explicitly opposed extending the Church–Turing thesis to domains such as cognition, intelligence, or teaching. They argue that interpreting the thesis as a basis for claiming that all human processes are automatable constitutes an unjustified extrapolation, since the computability of a function does not entail its comprehensibility, meaning, or cognitive equivalence with human thought. Their critique is grounded in a distinction between formal execution and semantic understanding, challenging the notion that systems such as language models can be considered intelligent agents in a full sense. As they warn: “To say that the human mind is equivalent to a Turing machine is a strong metaphysical claim, not derived from the original Church–Turing thesis” (Bang & Nieh, 2022, p. 5).

This objection is relevant, but from the perspective of strong techno-automatism, it is not decisive. First, because the thesis advanced here does not require machines to teach *like humans* in an autonomous way, but merely to fulfill teaching functions within a broader technical-institutional network. Subjective understanding may be philosophically interesting, but it is technically irrelevant when systems succeed in producing functional pedagogical effects—such as explaining, assessing, personalizing, or correcting. Second, because the history of capitalism has repeatedly shown that human originality yields to operational efficiency whenever it becomes feasible (Caffentzis, 2013), and teaching has historically followed this same logic.

Watters (2023) has shown that most educational automation tools are developed by actors outside the field of education, with little or no regard for its history or theoretical foundations. Yet this has not prevented their expansion: assessment platforms, feedback algorithms, performance analytics, and content personalization systems are already replacing core teaching functions—not because they embody pedagogical depth, but because they perform minimal tasks in scalable and operational ways.

George Caffentzis (2013) argues that capitalism, as a system of valorization, recognizes no essential limits to automation. Any form of human labor—including intellectual or pedagogical labor—can be absorbed, provided that a functionally efficient technology exists to replace it. The resistance to such replacement does not stem from a structural distinction between manual and mental labor, but rather from the symbolic and identity-based attachment that certain professional sectors—such as educators, intellectuals, and academics—maintain toward their activity. From this perspective, knowledge transmission is no less automatable than any other form of labor, although, as Caffentzis himself notes, intellectuals tend to defend their irreducibility for obvious reasons.

This thesis also enables a reformulation of affective objections that claim teaching inherently requires empathy, contact, and situated judgment. Even if this is granted, it does not preclude the reproduction of those functions under technical-computational conditions. There already exist systems capable of responding emotionally to students (empathetic chatbots), adapting content based on behavioral data (adaptive platforms), or delivering emotionally individualized feedback at scale. The fact that such responses do not arise from a subject's inner life does not negate their functional effectiveness.

Therefore, the argument presented here does not claim that machines are superior to humans or that they understand what they do, but rather that there is no ontological barrier preventing their progressive advance over educational functions. What was once an embodied practice in school-based technology may now be reconfigured as an interaction mediated by distributed systems, tracking algorithms, and intelligent content networks.

Although situated within the horizon of technical plausibility, the automation of teaching has not yet reached the threshold required to surpass state-run school systems. But this is not an indication of impossibility—rather, it reflects a conjuncture in which the evolutionary *embonages* have not yet fully aligned (De Landa, 2021). Its likelihood depends on science and technology, but above all on their integration into broader structural dynamics.

The following section explores how this process of automation is directly tied to the internal logics of contemporary capitalism.

The Capitalist Becoming of the Teaching Function

Up to this point, the argument has established that teaching is technically and functionally automatable. However, this article advances a further claim: automation is not simply one option among others, nor a contingent solution to educational problems, but rather a process inscribed in the accelerated operational logic of contemporary capitalism (Land, 2011).

Since its inception, capitalism has been characterized by an expansive dynamic in which technological innovation serves as a central mechanism for transforming human labor. This transformation is driven by the pursuit of efficiency, scale, and profitability through the substitution of human labor with autoreplicating and self-sophisticating technical devices. Nick Land (2011) refers to this dynamic as “machinic delirium.”

This was previously described by Joseph Schumpeter (2013) as “creative destruction”: a process whereby capitalism systematically eliminates previous forms of production to make way for new technologies and organizational models. In the case of education, this destruction does not primarily replace content, but rather modes of transmission, pedagogical agents, and institutional forms. As Narodowski and Campetella (2022) have observed, even in their most stable phases, educational systems have not been immune to this logic of technical disruption.

Returning to Caffentzis (1997; 2013), intellectual, affective, or creative labor is not an exception to this process, but its next frontier. Capital does not seek to preserve meaningful forms of work, but to absorb all available human energy—provided a technology exists that enables its extraction and functional replacement through a cybernetic principle of acceleration and dissolution. This drive continually seeks to eliminate every human obstacle—opacity, slowness, judgment, embodiment—in favor of unlimited technical intensification (Land, 2011; 2018). In its most radical theoretical form, capitalism might even be defined by its “thirst for annihilation” (Land, 2002). Within this framework, teaching may now represent an operational bottleneck: a slow, embodied regime that contradicts the accelerated, global, and computational logic of digital capitalism. Yet its automation is not a pedagogical or political choice—it is capitalism’s systemic horizon.

Techno-optimist positions (Kurzweil, 2005; Moravec, 1988) maintain that computational advances will not only transform human functions but will eventually replicate or even surpass cognitive, affective, and ethical capacities. Within this framework, the automation of teaching is not an exception but a logical consequence. If the brain can be optimized, why not also the act of teaching? Of course, these visions must be read as theoretical symptoms of a process already underway. Capital does not require the full realization of these predictions—it suffices that some educational functions be assumed by cheaper,

scalable, and measurable systems emerging from engineering and venture capital, guided more by the logic of financial efficiency than by that of learning (Watters, 2023).

In this context, resistance to the automation of teaching does not stem from technical limits, but from symbolic and identity-based attachments. As Caffentzis (2013) shows, the defense of intellectual labor is often framed in terms of singularity: it is claimed that thought, empathy, or situated judgment cannot be replicated. Yet this defense, while understandable, does not prevent functional substitution. History demonstrates that human singularity becomes irrelevant whenever a technical system is capable of fulfilling its function more efficiently—particularly under conditions of capitalist acceleration.

From this perspective, teaching faces a structural transformation. The question is no longer whether technologies should be used, but rather recognizing that their integration follows a momentum alien to traditional pedagogical or political deliberation. Automation does not arrive to collaborate—it comes to absorb, redistribute, and ultimately replace.

Therefore, automation is not merely possible; it constitutes a probable horizon of accelerated capitalism according to its own internal logic. Every technical advancement that reduces the cost, time, or uncertainty of the educational act reinforces this trajectory. The question is no longer whether teachers will be replaced, but how teaching will be reconfigured when its execution no longer requires human bodies or energy.

Insufficient Technological Development and Symbolic Resistance

At this point, a reasonable objection arises: if automation is technically feasible and systemically probable, why has it not yet been fully realized? The answer is not univocal. What currently prevents full automation is not a single cause, but a combination of obstacles.

On the one hand, existing systems have not yet reached the technological maturity required to fully replace core teaching functions (Díaz & Nussbaum, 2024). Although adaptive platforms, feedback algorithms, and automated assessment systems have advanced rapidly, they still rely on human supervision, contextual adjustments, and institutional containment. As shown by Watters (2023) and Gilliard and Selwyn (2023), many of these systems are developed by actors with limited understanding of the pedagogical field. Moreover, in contexts of structural inequality, problems related to infrastructure, connectivity, and maintenance reinforce operational limitations (UNESCO, 2023).

Nonetheless, it is reasonable to assume that current technological insufficiencies represent a transitional phase. As systems improve in scalability, interoperability, and adaptability, the threshold of friction that justifies the persistence of human teachers will continue to decline. Recent developments in machine learning platforms, intelligent tutoring systems, and algorithmic feedback show that central teaching functions are already being technically replicated. Indeed, current systems already allow for the replacement of many functions traditionally performed by humans in partially controlled environments—such as virtual higher education, corporate training, or professional

development platforms. And yet, these systems are not being massively deployed in compulsory schooling. Why?

The most compelling explanation lies in symbolic, identity-based, and institutional resistance to replacing the human teacher. In modern societies, the figure of the teacher concentrates a constellation of moral, affective, and civic values—except perhaps in autocratic or theocratic regimes—that far exceed their pedagogical role. The teacher represents continuity, care, citizenship, vocation. In many ways, it is one of the last remaining figures of legitimacy in the public sphere. To automate teaching is to dismantle that symbolic investiture.

This dimension has been widely documented in postdigital studies and critical sociology of education. In particular, the article by Bergviken Rensfeldt and Rahm (2023) provides a rigorous reconstruction of the discourses, policies, and institutional assemblages that have shaped educational automation in Sweden since 1957. Their approach, anchored in policy assemblage theory and science and technology studies (STS), convincingly shows how teaching work has been progressively reconfigured by technologies that complement, monitor, or duplicate it—but rarely replace it. The authors explain this ambivalence in terms of tensions between technical imaginaries and professional logics, between promises of efficiency and union resistance, between partial automation and invisible labor.

This raises fundamental questions: is there a structural reason why machines cannot teach? Or are we facing yet another case of adaptive lag, where the devices already exist, but institutional frameworks have not yet fully assimilated them? By historicizing discourses without confronting them with the strong hypothesis of general computability and the technical becoming of capital, there is a risk that the analysis of the phenomenon fails to grasp its structural magnitude.

In this light, the slow progress of educational automation cannot be explained solely by technical limitations or symbolic resistance. It is also shaped by a deeper biopolitical architecture. The modern school was not designed solely to teach, but to supervise (Paglayan, 2024). For the first time in history, adults began to work without their children. This generational separation, characteristic of industrial capitalism, necessitated the invention of a temporal and moral containment technology: the school (Opriş, 2021).

In this sense, schooling fulfills functions that remain difficult to replace: containing and monitoring bodies, occupying time, and organizing children's space while capital extracts adult labor. Even if teaching can be automated, the school—as a guardian of bodies, emotions, and rhythms—remains functional to the regime of accumulation.

Thus, teaching does not seem to persist due to pedagogical efficiency, but because of its role in the logistical architecture of childhood control. Its technical obsolescence does not impede its institutional continuity: it is still needed as a mediator in a system that requires children to be contained while adults are mobilized by capital.

The biopolitical obstacle sustaining the school is not pedagogical, but logistical: someone must care for children's bodies while capital occupies their parents. Therefore, automating teaching requires more than technological progress; it demands a political reconfiguration of how we organize time, care, and childhood.

This triple limitation—technical, symbolic, and biopolitical—offers a plausible explanation for why educational automation has not yet reached completion. But none of these reasons constitute a definitive structural barrier. The first will be overcome through technological development. The second, through institutional displacement and symbolic transformation. The third, through post-school forms of custodial technology (institutional, technological, or systemic), or through the reconfiguration of labor and social reproduction regimes.

Teaching Beyond the Subject: Automation and the Dissolution of the Center

Beyond the analysis of whether machines can teach, and of teaching's embeddedness in capitalist automation processes, a deeper turn is required: an interrogation of the ontological status of the "human teacher" and their potential dissolution.

Revisiting earlier concepts, teaching has historically been codified as a rational, volitional, and transcendent human act. Yet this attribution is not an unassailable fact, but rather the contingent effect of evolutionary, technological, and symbolic assemblages that—long before the emergence of school technologies—constructed the figure of the teacher as the guarantor of transmission. Today, these assemblages are mutating—not because technologies are invading a pure domain, but because they are redrawing existing technologies, particularly the school.

The decentering of the subject is a material condition. As platforms, algorithms, sensors, and networks become operational substrates of learning, teaching is transformed into a distributed architecture of impersonal operations, with diminishing roles for bodies and intentions. Unlike writing—which removed the teacher's physical presence from the act of teaching—algorithmic automation technically realizes Michel Foucault's (2023) hypothesis of the author as a function rather than an origin, whose effect is a text as the pure exteriorization of what we call "intention."

Automation radicalizes Foucault's already radical insight: if the subject is a discursive effect, then in automatic systems, not even that function is necessary. Automation does not merely critique the subject—it leaves it behind as a condition of operation. Where Foucault denounced the myth of the founding human subject, automation displaces it altogether, without metaphor.

This reveals a decisive discontinuity in the becoming of teaching: it can now dispense with the human as a source or guarantor of rationality and transcendence, features long associated with school technologies. It marks a leap in cumulative cultural evolution whereby teaching no longer requires a body or an intention oriented toward human genericity.

Accepting this metamorphosis demands abandoning certain theoretical reflexes. The first is anthropocentrism: the idea that any legitimate educational configuration must place the human at its center. The second is its technophilic inverse: the fantasy that machines will redeem education from its historical defects. Both share the same error: assuming that there is still a center.

This framework enables a more lucid interrogation of the ongoing mutations. The aim is not to declare the death of the teacher, but to understand how their role has been reconfigured—as a provisional node, a symbolic residue, or a residual interface. What forms of agency emerge when teaching is no longer defined by the *who*, but by the *how*?

This ontological displacement must be considered in dialogue with the most recent conceptual frameworks addressing the technological transformation of education: postdigital thought.

The Postdigital Turn

At this point, it is worth interrogating the place of postdigital thought within this conceptual map. The first thing one notices is its diversity of positions: “the postdigital is hard to define; messy; unpredictable; digital and analog; technological and non-technological; biological and informational. The postdigital implies both a rupture with and a continuation of our existing theories” (Jandrić et al., 2018).

Authors who emphasize continuity tend to reaffirm the human: they call for the recovery of reflexivity, denounce technological solutionism, and emphasize human mediation and teacher agency in line with the emancipatory ideals of modernity. Their work focuses, for example, on the social harms produced by generative artificial intelligence, which reproduces and amplifies existing biases, yielding discriminatory outputs that reinforce structural inequities in already unequal educational settings. As Selwyn et al. (2023) argue, “it is highly unlikely that automated systems implemented in an already unequal or discriminatory educational context will somehow lead to radically different, liberatory, or emancipatory outcomes,” thereby altering the specifically human experience of education.

From this perspective, there remains confidence in human agency and the preservation of collective values. “As has happened many times before, it is our responsibility to shape technology and our coexistence with it in ways that reflect a broader vision of the kind of world we wish to inhabit in the future” (Peters et al., 2024, p. 11, emphasis added).

Within this orientation, a political stance emerges that warns that automation also reconfigures power relations—consolidating decision-making in the hands of technological corporations while undermining educators’ autonomy (Gilliard & Selwyn, 2022). The social harm benefits large tech companies while weakening the public function of teachers.

On the other hand, research that emphasizes rupture recognizes that the digital is constitutive of contemporary social and cognitive configurations (Knox, 2016; Fawns, 2019). The postdigital educational environment does not simply integrate technologies—it is constituted through them, in a system where human agency is entangled with technical systems.

This turn requires abandoning dualistic visions that separate the human from the technical, the natural from the artificial, and embracing the idea that contemporary educational practices emerge from heterogeneous assemblages. As Fawns (2019) argues,

the postdigital is a condition in which distinctions between online and offline, human and non-human, become increasingly blurred.

Furthermore, this condition challenges the figure of the modern teacher as the sole bearer of legitimate knowledge. Rather than viewing automation as a mere substitution of the teacher by a machine, it becomes possible to understand how certain teaching functions are already being assumed by algorithmic systems—without thereby eliminating the educational practice itself.

Postdigital theory presents internal tensions: it acknowledges distributed agency between humans and technologies, yet insists on the necessity of teacher judgment; it accepts dematerialization, yet underscores the importance of the body; it admits indeterminacy, yet demands political responsibility. Where normative commitments persist, critiques of automation are anchored in a rearticulated humanism. In other strands, the theory approaches a posthuman horizon (Knox, 2016).

The posthumanist perspective (Roden, 2014) holds that the automation of teaching is part of a broader process of redistributing cognitive and functional agency, signaling a transition toward a form of education in which the human is no longer the sole—or perhaps even the primary—agent of learning. Teaching is no longer an exclusively personal act, but a distributed architecture of interactive operations.

The growing integration of intelligent technologies into education accelerates this redistribution, radically reconfiguring it. Education becomes a posthuman assemblage in which decisions, learning rhythms, and validation criteria emerge from the interaction of human and non-human agents. It is in this interstice that the *posthuman surplus* (Roden, 2014) emerges: capacities traditionally associated with the subject can now be executed by systems whose structure no longer refers to human experience.

This tension also invites us to acknowledge our limited ability to anticipate what will come (Macgilchrist et al, 2024): posthuman conditions imply a very partial capacity to foresee the future. From this perspective, postdigital thought might recognize that the future will not necessarily be guided by humanist volition. The limits of our current knowledge require us to speculate about scenarios—but no more than that—given the fundamental indeterminacy of what lies ahead (Roden, 2014).

Our hypothesis of strong techno-automatism offers postdigital thought an opportunity to construct a theoretical and speculative program within posthumanist frameworks (Roden, 2020). This program challenges emancipatory critiques of automation and technological acceleration, while enabling articulation with research in the social sciences and education that explore the potentialities of thought and technological development (Sellar & Cole, 2017).

Teaching at the Edge of the Human

This is not to deny the relevance of the social, symbolic, or affective functions that teachers have historically fulfilled within the school apparatus—such as building relationships, transmitting values, offering emotional support, exercising situated judgment, or providing subjective containment. But the fact that a function is meaningful

does not make it irreducible. The common mistake lies in conflating significance with indispensability, as if the presence of deep human aspects in teaching constituted a structural barrier to its automation.

This article has argued that such functions do not represent ontological limits, but rather institutional and ideological constructions that have naturalized a particular form of performing teaching. That these tasks have historically been carried out by human subjects does not preclude their being assumed—at least functionally—by artificial systems. A machine does not need to *feel* in order to assess, provide feedback, classify, or guide; it merely needs to operate on formalizable patterns.

The automation of teaching is not a future threat nor a political option up for deliberation—it is a process inscribed in the structural becoming of accelerated capitalism. Teaching, as an evolutionarily grounded and technologically mediated function, is formalizable, replicable, and computable. In this scenario, education does not disappear—it mutates: it changes form, scale, medium, and regime of truth. We are witnessing a displacement in which teaching no longer requires bodies, classrooms, or stable relationships, but instead functional architectures capable of generating learning effects that align with systems of measurement, governance, and performance. The teacher may become progressively peripheral; their role reconfigured as interface, mediator, or facilitator.

As Mark Fisher (2022) warned, many defenses of the school world operate within a logic of *reflexive impotence*: they acknowledge the system’s mutation, yet cling to symbols whose effectiveness is fading. What is being defended is not only the practice of teaching, but the centrality of the human adult as guarantor of the educational process. However, that centrality is no longer a material condition of the system’s functioning.

Does recognizing this trend imply surrendering all forms of political agency? Not necessarily. But it does require letting go of anthropocentric fictions that imagine the human as the immovable center of educational order. One cannot defend “the human” without acknowledging that its centrality is no longer a necessary condition of possibility. Only a lucid reading of material conditions can open space for new forms of action, resistance, or reinvention.

In this sense, a postdigital theory grounded in speculative posthumanism may provide a fertile framework for rethinking teaching as a distributed relational practice, in which human and non-human systems co-produce knowledge, affect, and agency. This perspective is not limited to denouncing the oppressive effects of digital capitalism; it seeks to map its trajectories, understand its assemblages, and explore lines of flight wherever schooling becomes dysfunctional or unnecessary—and where neither anthropocentric nor emancipatory reflexes are preconditions for meaningful practice.

Thinking education beyond the human subject does not mean abolishing the human, but displacing it as the exclusive organizing center of the educational process. Such decentering may enable new forms of care, mediation, play, or transmission—without falling into technocratic fetishism or nostalgic longing for a lost centrality. At the edge of the human, a postdigital theory grounded in posthumanism offers conceptual tools for

imagining expanded, unstable, contingent, and non-anthropocentric educational ecologies.

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