

Educational research in hybrid ecosystems: the role of generative AI as a sparring partner¹

*Pesquisa educacional em ecossistemas híbridos: o papel da IA
generativa como parceiro de treinamento*

*La recherche en éducation dans les écosystèmes hybrides: le
rôle de l'IA générative comme sparring partner*

Lorenza Maria Capolla

University of Macerata (Unimc), Macerata, Italy

<https://orcid.org/0009-0008-3338-1096>

l.capolla@unimc.it

Francesca Gratani

University of Macerata (Unimc), Macerata, Italy

<https://orcid.org/0000-0003-2974-0101>

f.gratani@unimc.it

Maila Pentucci

University "Gabriele D'Annunzio" (Unich), Chieti-Pescara, Italy

<https://orcid.org/0000-0003-3826-8128>

maila.pentucci@unich.it

Lorella Giannandrea

University of Macerata (Unimc), Macerata, Italy

<https://orcid.org/0000-0002-1169-4795>

lorella.giannandrea@unimc.it

Pier Giuseppe Rossi

University of Macerata (Unimc), Macerata, Italy

<https://orcid.org/0000-0001-9801-6307>

piergiusepperossi1@gmail.com

¹ This article is the result of a shared effort among all authors, who jointly contributed to the conceptualisation, development, and writing of the manuscript. Specifically, Lorenza Maria Capolla is the author of section 3.1; Francesca Gratani is the author of sections 3.2 and 3.3; Maila Pentucci is the author of sections 1, 2, and 2.1; Lorella Giannandrea is the author of sections 2.2, 2.3, and 2.4; Pier Giuseppe Rossi is the author of section 4.

Abstract

The article examines the role of Generative Artificial Intelligence in educational research as a socio-material and epistemic infrastructure embedded in contemporary regimes of power and knowledge production. It aims to move beyond techno-optimistic and techno-sceptical dichotomies by conceptualising AI as a non-neutral assemblage shaped by platform capitalism, data colonialism, and infrastructural dependencies. Drawing on more-than-human perspectives, the article explores how interactions between researchers and generative systems reconfigure processes of knowledge production and agency. While AI may reinforce existing forms of epistemic control, it can also open spaces for critical inquiry and resistance. To support such possibilities, the paper discusses some practices as ways of reconfiguring human–AI relations and avoiding the delegation of epistemic agency. Rather than treating AI as a device for generating answers, the article proposes understanding it as a dialogic sparring partner capable of provoking questions, challenging assumptions, and reshaping the co-construction of knowledge. The value of AI thus lies not in replacing human judgment but in expanding the dialogical spaces through which knowledge is produced.

Keywords: generative artificial intelligence, educational research, methodology, hybrid ecosystems, more-than-human perspective.

Resumo

O artigo examina o papel da Inteligência Artificial Generativa na investigação educacional como uma infraestrutura sociomaterial e epistêmica inserida nos regimes contemporâneos de poder e produção de conhecimento. Procura ultrapassar as dicotomias tecno-otimistas e tecno-céticas ao conceptualizar a IA como um agenciamento não neutro, moldado pelo capitalismo de plataforma, pelo colonialismo de dados e por dependências infraestruturais. Com base em perspectivas *more-than-human*, o artigo explora de que modo as interações entre investigadores e sistemas generativos reconfiguram os processos de produção de conhecimento e de agência. Embora a IA possa reforçar formas existentes de controlo epistémico, também pode abrir espaços para a investigação crítica e para a resistência. Para sustentar essas possibilidades, o artigo discute algumas práticas como formas de reconfigurar as relações entre humanos e IA e de evitar a delegação da agência epistémica. Em vez de tratar a IA como um dispositivo para gerar respostas, o artigo propõe compreendê-la como um *sparring partner*, capaz de suscitar questões, desafiar pressupostos e remodelar a co-construção do conhecimento. O valor da IA reside, assim, não na substituição do juízo humano, mas na expansão dos espaços dialógicos através dos quais o conhecimento é produzido.

Palavras-chaves: inteligência artificial generativa, pesquisa educacional, metodologia, ecossistemas híbridos, perspectiva mais-que-humana.

Resumé

Cet article examine le rôle de l'Intelligence Artificielle Générative dans la recherche en éducation en tant qu'infrastructure socio-matérielle et épistémique inscrite dans les régimes contemporains de pouvoir et de production des savoirs. Il cherche à dépasser les oppositions entre techno-optimisme et techno-scepticisme en conceptualisant l'IA comme un assemblage non neutre, façonné par le capitalisme de plateforme, le colonialisme des données et les dépendances infrastructurales. S'appuyant sur des perspectives *more-than-human*, l'article explore la manière dont les interactions entre les chercheurs et les systèmes génératifs reconfigurent les processus de production des savoirs et les formes d'agentivité. Si l'IA peut renforcer des formes existantes de contrôle épistémique, elle peut également ouvrir des

espaces d'enquête critique et de résistance. Afin de soutenir ces possibilités, l'article discute de certaines pratiques permettant de reconfigurer les relations entre humains et IA et d'éviter la délégation de l'agentivité épistémique. Plutôt que de considérer l'IA comme un dispositif destiné à produire des réponses, l'article propose de la comprendre comme un *sparring partner*, capable de susciter des questions, de remettre en cause les présupposés et de reconfigurer la co-construction des savoirs. La valeur de l'IA réside ainsi non pas dans le remplacement du jugement humain, mais dans l'élargissement des espaces dialogiques à travers lesquels les savoirs sont produits.

Mots-clés: intelligence artificielle générative, recherche en éducation, méthodologie, écosystèmes hybrides, perspective *more-than-human*.

1 Introduction

The use of Generative AI (GenAI) in academic research raises several questions concerning the production, legitimisation, construction, and dissemination of scientific knowledge. Moving beyond both techno-sceptical and techno-optimistic positions, it seems important to understand whether, and in what ways, epistemic interactions emerge when researchers engage in dialogue with generative systems.

This paper seeks to address three main questions:

- 1) How does GenAI reconfigure the co-construction of knowledge in educational research?
- 2) What practices enable researchers to resist the delegation of epistemic agency to AI?
- 3) How does interaction with AI create opportunities for questioning, reformulating concepts, and developing critical distance, influencing the researcher's stance more than the final product of the research itself?

The paper is organised into three sections. The first discusses AI as a socio-material infrastructure within the context of contemporary capitalism, algocracy, and data colonialism. The second proposes deviation, suspension, and triangulation as practices for reconfiguring the dialogue with the artificial agent, which is assigned the role of a sparring partner within the research process. The third addresses the issue of “saved” time, understood not merely as acceleration, but as a resource to be reinvested in verification, returning to sources, and critical reflection.

Rather than presenting the results of a systematic empirical study, the paper draws on a series of illustrative examples taken from “situated” interactions, specifically generated between a researcher and ChatGPT (version 5.4) during a research process. These examples function as heuristic and argumentative episodes, making visible some of the dynamics of human–AI interaction: the tendency of the system to produce premature closure, the

possibility of deviating from proposed trajectories, the role of triangulation with texts, sources, and theoretical frameworks, and the need to reposition every output within a broader interpretative context.

2 AI, power and interaction

Contemporary educational research is grappling with a profound transformation of its reference contexts, driven by increasing complexity, fragmentation, and uncertainty associated with post-digital systems (Capolla *et al.*, 2024; Jandrić *et al.*, 2018; Pentucci *et al.*, 2025). In this scenario, the introduction of tools based on GenAI, and, in particular, Large Language Models (LLMs), has further complicated the landscape and is therefore the subject of significant scholarly attention. However, the debate tends to reproduce already familiar dichotomies. On the one hand, a techno-sceptical perspective emphasizes the risk of human replacement and the homogenization of research processes; on the other hand, a techno-optimistic view highlights the potential increase in productivity, the reduction of time spent in specific tasks, and the capacity to process otherwise unmanageable amounts of data.

Both positions, despite their opposition, share an implicit assumption: they primarily conceive of AI as a technology, focusing on its instrumental dimension. Such a perspective risks isolating AI from the socio-material context in which it develops and obscuring its implications in relation to power and its legitimation. Some scholars have examined AI through a holistic lens, defining it as an infrastructure intertwined with dynamics of power, extraction, and governance. In this sense, Crawford (2021) has highlighted how AI constitutes an assemblage of material resources, labour, data, and political decisions, while Verdegem (2024) has emphasized the central role of data as a new form of capital. Similarly, Couldry and Mejias (2019) have interpreted the expansion of AI as a new form of appropriation of social life, defined as data colonialism. Adopting the perspective that AI is not a neutral element, scholars tend to emphasize that it does not merely produce knowledge, or recombine its fragments, but also contributes to shaping the very conditions under which something can be recognized as knowledge.

On the other hand, interpreting AI as a monolithic block of power risks being equally reductive. The dynamics described, in fact, do not configure a homogeneous and closed system but also reveal internal tensions and contradictions. AI, therefore, can be understood as an unstable and negotiated infrastructure, within which micro-spaces of action, freedom, and dialogue may emerge. These can be activated both through practices

and through forms of reflection, in which a central role is always played by context and by the intentions of the actors who inhabit it (Pischetola *et al.*, 2026).

2.1 AI as socio-material infrastructure and capitalism

Interpreting AI as an infrastructure of data extraction and governance, traversed by internal contradictions and spaces of tension that can be reorganised only through the intentional subjectivity of the human agent, situates it firmly within contemporary capitalism. It is not merely a technology, but a *dispositif* that reorganises the conditions of production of knowledge, value, and power. In this sense, analysing the development and diffusion of AI through the lens of capitalist dominance also makes it possible to understand the nature of the investments that sustain it: not oriented toward immediate profit (the Big Tech sectors developing AI operate at a loss), but toward the strategic control of data, computational capacity, and access to markets.

It is precisely at this level that some scholars have highlighted significant dynamics. As Tan and Thelen (2025) point out, competition in the field of AI increasingly concerns access to material infrastructures, particularly cloud systems and computational resources — and, more recently, even outer space. These dynamics give rise to real “choke points,” that is, obligatory nodes through which other actors must necessarily pass. From this perspective, companies do not merely sell products but construct conditions of structural dependency.

In line with this interpretation, Morozov (2018) reads these processes as forms of political-economic investment in dominance, in which value lies more in the position occupied within the ecosystem than in the individual technological product. AI thus takes shape as a strategic infrastructure that organizes hierarchies of access and possibility.

At a broader level, Couldry and Mejias (2019) describe this process as a new phase of capitalism, grounded in the transformation of social life into raw material to be extracted and capitalised. Data relations establish a social order based on continuous tracking, in which AI contributes to making reality progressively quantifiable and governable.

A related perspective, though more explicitly geopolitical, is proposed by Muldoon and Wu (2023), who situate AI production within a “colonial matrix of power,” highlighting how global supply chains, digital labour, and epistemic hierarchies reproduce historical inequalities between the Global North and South.

Within this framework, an approach focused exclusively on the ethics of systems appears insufficient. As Terzis (2023) observes, regulation that does not take into account

the material conditions of production and global value chains risks leaving intact the power structures that AI helps to consolidate.

The analysis cannot be limited to recognizing that AI reinforces, reproduces, or imposes logics of domination; rather, it must also interrogate whether and how the dynamics described above may enable or foster the opening of micro-spaces or contradictions within them. In particular, one question emerges as crucial and deserves further investigation: when interaction with AI is oriented toward the request for solutions, the perspective of epistemic agency delegation tends to prevail; when, instead, it is reoriented in a dialogical direction, it may contribute to expanding the space within which thought takes shape, fostering and participating in the activation of processes of questioning, reformulation, and discovery. This second mode of interaction with the artificial agent, drawing on a Foucauldian understanding of power as a field of possibilities and moving beyond the dichotomies of good–evil and true–false (Foucault, 1971), reduces the perception of dependence on AI and the relegation of the human agent to the role of verifying the truthfulness and reliability of the information produced by the artificial agent. It opens up the possibility of using AI as a *dispositif* capable of participating in the interactive process among different actors involved in the production of knowledge. This approach also compels a rethinking of the value assigned to the interaction between human and artificial agents, which does not primarily depend on the accuracy of the response produced or the solution proposed but rather on the capacity of the interaction to open up and expand the dialogical space within which thought materialises.

2.2 AI as a field of contradictions and possibilities

Interpreting AI as an infrastructure of power, while necessary, is not sufficient to exhaust its understanding. As shown by Foucault (1971), *dispositifs* of power never operate in a total or closed manner but rather take shape as relational fields within which tensions, resistances, and possibilities for rearticulation are continuously produced. In this sense, power does not stand in opposition to freedom but structures its field of possibilities: it is an action upon possible actions.

Applied to AI, this perspective makes it possible to move beyond both a deterministic reading, which interprets it as a device of total control, and a naively emancipatory view. AI is instead configured as a field traversed by structural contradictions, which render its functioning unstable and open to negotiation.

A first contradiction concerns the relationship between closure and openness. Srnicek (2017) highlights how digital platforms are structurally oriented toward centralization

and control, while simultaneously depending on diffuse forms of participation and cooperation. Similarly, AI systems are grounded in continuous flows of data and interactions that cannot be fully governed, thereby generating spaces for unforeseen uses and practices of reappropriation.

A second tension emerges between capture and excess. Following Terranova (2022), the value produced in digital contexts always exceeds attempts at economic appropriation. In the case of AI as well, processes of interaction, production, and interpretation of content generate forms of meaning and use that are not entirely reducible to the logics of extraction and control.

A third contradiction concerns the relationship between control and unpredictability. As Pickering (1993) points out, socio-technical systems are never fully governable, but develop through a dynamic of mutual adaptation between humans and non-humans. From this perspective, AI as well, although designed to optimize and predict, inevitably produces discrepancies, deviations, and unexpected outcomes.

Finally, a fundamental tension runs through the relationship between automation and the reopening of thought. According to Stiegler (2012), every technology takes the form of a *pharmakon*, that is, something that can simultaneously diminish critical capacities and, at the same time, reactivate them. From this perspective, AI is not only a device for the automation of knowledge but can also become an instrument of “disautomation”, capable of reopening the reflective process, as illustrated by the examples presented in Section 2.

These contradictions do not automatically constitute possible pathways of escape external to the system but rather indicate the potential presence of spaces for intervention. The point is not to withdraw from AI but to grasp the fractures generated by the tensions that traverse it and to inhabit them critically, recognizing that every practice is situated within relations of power that cannot be eliminated.

2.3 From delegation of epistemic agency to dialogic space

The contradictions that characterize AI make it possible to identify micro-spaces through which the relationship with these systems can be reoriented. Concretely, this entails approaching AI systems not by seeking definitive answers to direct questions to be evaluated in terms of reliability and truthfulness but by investigating and understanding the conditions through which knowledge is constructed by the systems, namely through processes of interaction. From this perspective, a relevant praxis consists in resisting the closures toward which AI tends by relaunching the interaction through further questioning, introducing

interpretive fractures, or suspending the proposed solutions, in order to reopen the space for the elaboration of knowledge.

Once again, the idea that true knowledge does not constitute a neutral given, but rather the outcome of specific regimes of production and legitimation, resonates with Foucauldian thought (1971). Interrogating AI exclusively as a source of correct answers means positioning oneself within a logic of epistemic delegation, in which the system is implicitly recognized as an authority. A different configuration emerges if AI is understood not as a problem-solving *dispositif* but as an interlocutor within a dialogical process. In this regard, one can speak of “dialogic education” (Wegerif; Casebourne, 2025), that is, a paradigm according to which knowledge is conceived as a phenomenon that forms in the contextual space between different voices rather than as the outcome of a single, definitive answer.

Interaction with AI can thus be reinterpreted as a triangulation among agents, in which the system does not close the cognitive process but contributes to expanding it by introducing differences, alternatives, and possibilities for reformulation. In this configuration, the value of AI does not lie in the correctness of the response but in its capacity to expand the dialogical space within which thought develops. Such a perspective does not imply an exit from relations of power. On the contrary, dialogue emerges as a situated mode of rearticulating power, in which positions of authority are continuously negotiated. AI models, in fact, incorporate specific cultural and epistemic structures that continue to operate even within dialogical practices.

For this reason, the dialogical use of AI requires a critically informed epistemic stance. This does not entail abandoning content knowledge or the search for understanding but rather recognizing that meaning emerges through processes of interaction, conflict, and negotiation. In this sense, AI can be understood as a *dispositif* capable of reopening the field of possibilities of thought.

2.4 AI as a Sparring Partner

The role of AI as a Sparring Partner (SP) is often proposed but not systematically analysed or defined. We propose the following definition: an AI sparring partner interacts with users through a combination of cooperative and challenging modes, in which the AI is selected, customized, or self-adapting to match a level of skill that neither over nor under-challenges users. AI as a SP can support creativity, broaden perspectives, and foster learning and critical thinking, either with respect to ideas and decisions or to the AI itself. Sparring

with AI can be explicit, for example, when the AI simulates specific roles, or implicit, when it is used to explore whether or how to enhance existing work (Herrmann, 2025). Both contrasting positions are the result of the hype generated around AI.

3 Key issues in the use of AI as a Sparring Partner

3.1 Toward a more-than-human approach to research

If AI is a sparring partner, research can no longer be understood as a process of individual knowledge production, but rather as a space of interaction in which knowledge emerges through dialogue between human and non-human agents. From this perspective, research can be reinterpreted within a more-than-human dimension (Herbrechter, 2023) in which actions, thoughts, and knowledge are not attributable to a single subject but instead emerge from relationships distributed among human and non-human agents. AI, therefore, does not function simply as a source of answers but as a relational epistemic actor, capable of advancing the research process through the generation of questions, the reorganisation of data, and the emergence of connections that are not immediately visible. Yet this epistemic contribution is always mediated by the researcher's capacity to evaluate, interpret, and validate what the system produces.

The challenge, then, is to identify specific practices that enable us to create, within dialogue, small pockets of resistance, thereby deferring the closure of interactions and refusing to conform to the logic of such interactions, which are consistent with the power models on which it has been trained.

In this direction, several practices can be identified that do not function as mere techniques of use but as ways of rearticulating the research process with AI. These include: deferring AI's tendency toward closure by suspending immediate acceptance of its outputs, relaunching the interaction through new questions that deepen and reframe the problem, deviating from the system's proposed trajectories exploring alternative directions, and adopting a triangulated approach in which AI becomes one actor within a broader dialogical space that remains open.

These practices do not eliminate power dynamics, but can enable a situated reconfiguration, opening up micro-spaces of resistance within the process of knowledge production. The examples discussed below are not based on a systematic empirical study but rather on the authors' personal experiences and on purposefully generated interactions

between the researcher and ChatGPT. Treated as heuristic cases, they serve to illuminate key dynamics of human–AI interaction that are often difficult to observe directly.

3.1.1 To defer closure

Deferring closure means, first of all, not allowing AI to take control of the interaction. AI systems tend to conclude the process by proposing solutions, synthesizing the problem, or offering reassuring and seemingly definitive answers. Suspending such closures does not imply replacing one answer with another but rather keeping the space of inquiry open, preventing the process from being redirected or reduced to a single solution.

From this perspective, the issue is not the opposition between different forms of power, but the possibility of making the processes through which knowledge takes shape visible and open to negotiation. As Foucault (1971) suggests, the most effective form of power is the one that does not present itself as such but appears as normality. At the same time, according to Latour (2005), the production of knowledge can be understood as the result of relations among heterogeneous actors, in which no element, whether human or non-human, holds exclusive control over the process.

AI is fully inscribed within this dynamic: it exercises power not only through explicit control but through the ways in which it implicitly defines what counts as knowledge, competence, and a valid response, legitimizing certain outputs as correct while marginalizing others. Deferring closure thus means suspending this implicit legitimation and reopening the interpretive process, reconfiguring the distribution of agency among the actors involved.

Interaction is sustained through the formulation of new questions, which do not seek definitive answers but aim to reorganise and broaden the extent of the problem, whilst keeping open the space for dialogue within which thought develops.

To illustrate how these dynamics unfold in a situated interaction, the following examples show different ways in which closure is both produced by the system and actively deferred by the researcher.

Figure 1 – Example 1: Asking for clarification

CHATGPT: If you like, in the next step, we can do something very useful:

👉 to transform these “practices” into 3–4 clear methodological indicators that can also be used in research or teaching.

RES: Let’s proceed step by step and follow my line of thought. If you recall, we had completed the first, more theoretical part. The second focuses on how research is changing in the age of AI or, more precisely, whether a triangulation with AI in research is possible and whether this triangulation rearticulates the research process. Let me know if this is clear, so we can then work on the individual paragraphs.

Source: Created by the author (2026).

This example highlights, on the one hand, the AI’s attempt to wrap up the conversation and steer it towards a more structured and definitive conclusion, and, on the other hand, the researcher’s decision to reassert control over the conversation. The researcher also asks, (“Let me know if this is clear”), effectively trying to check whether the direction in which they wish to proceed is clear.

Figure 2 – Example 2: Rephrasing and redefining the problem

CHATGPT: This paragraph is very strong and already well developed: your theoretical contribution clearly emerges here. If you wish, in the next step, we can engage in an even more refined exercise:

👉 to develop 2–3 original concepts (of your own) that tie everything together:

- AI
- power
- unexpected
- education

such as:

- “open yet asymmetrical infrastructure”
- “controlled contingency”
- “spaces of situated freedom”

and connect them directly to relevant authors.

RES: Let’s first explore the previous points in more detail. What do you mean by ‘controlled contingency’? Let’s start with Foucault, who discusses the relationship between power and resistance.

Source: Created by the author (2026).

In the second example, AI’s tendency to put forward proposals for action (“we can engage in an even more refined exercise”) and to interpret and normalise the researcher’s

thinking (original concepts “of your own”) becomes evident, as a form of control that operates through flattery (“very strong and already well developed”). In this case as well, the researcher defers closure by preventing a possible premature and superficial conceptualisation and keeping the conceptual field open.

Figure 3 – Example 3: Referring to sources

CHATGPT: If you wish, in the next step we can undertake a very interesting exercise:

👉 take a concrete example of your own (teaching, use of AI with students) and analyze it directly through a Foucauldian lens, showing:

- where power is located
- where forms of resistance emerge
- how they are reconfigured together

This would provide a very strong section for the paper.

RES: I'm reading Foucault. *Microphysics of Power*. In the essay 'Beyond Good and Evil', he says that humanism, and the individualism it has generated, are the cause of the absence of a desire for power. In other words, if I exist by virtue of who I am and what I possess, power lies with those who hold the power to legitimise property. I believe this return to the source is essential in order to move forward.

Source: Created by the author (2026).

As shown in Example 3, returning to the original source, rather than relying on syntheses, can counter processes of normalisation and closure. This example also highlights a typical proposal of operationalisation (“This would provide a very strong section for the paper”). Here, the researcher rejects the closed-ended “application” and redefines the starting point, thereby reopening the analytical trajectory.

Figure 4 – Example 4: Introducing new data

CHATGPT: If you like, let's move on to the second part (where your style really comes into its own).

RES: What if we introduce Latour?

CHATGPT: Yes — Latour fits in very well here, and not just as a decorative addition, but as a structural reinforcement of your argument. I'll explain why, and then I'll incorporate it into the paragraph.

Source: Created by the author (2026).

In this final example, instead of following the suggestion to proceed to the second stage of the analysis, the researcher proposes broadening the scope of the inquiry by introducing an author who had not previously been included in the investigation.

Across these interactions, the researcher employs various communicative strategies, such as asking for clarification, rephrasing and redefining the problem, referring to sources, and introducing new data. In each case, the responses generated by the artificial agent are not treated as definitive conclusions but are transformed into new questions that enable the scope of the investigation to be reorganised and the theoretical framework to be reframed and expanded. Deferring closure therefore emerges not as a strategy for rejecting AI outputs, but as a way of maintaining epistemic openness and preserving the researcher's capacity to shape the direction of inquiry.

3.1.2 Deviations

The second practice involves deviating from the trajectories proposed by the system, exploring alternative directions to those suggested, in order to move beyond the linearity of the solutions offered and reopen the field of possibilities of the research process. Deviations from the suggested directions are thus introduced in order to free the process from the linearity of solutions and reopen it as a space of freedom.

Figure 5 – Example 5: Reframing the chat as an object of analysis

RES: I would like to interrupt the theoretical analysis and revisit some excerpts from this chat in order to identify how I positioned myself in relation to you.

Source: Created by the author (2026).

Here, the researcher takes a different approach: rather than developing the proposed theory, he/she transforms the chat into the subject of analysis, moving from theoretical reflection to an empirical analysis of the interaction.

Deviation clearly emerges in the dialogues presented above at moments when the researcher does not follow the system's responses linearly, but instead redirects their trajectory, shifting the process onto different levels. This occurs, for example, when theoretical reflection is turned into an analysis of the interaction itself, when a general formulation is redesigned as a request for concrete evidence, or when the direction proposed by the system is interrupted in order to introduce new theoretical references or to redefine the structure of the work. In these cases, the AI's responses are not simply followed but are used as points of divergence that allow the field of inquiry to be reorganised.

3.1.3 Triangulation

The research takes the form of a triangulation among multiple actors (Latour, 2005), rather than as a direct relationship between a human agent and an artificial agent. In such configurations, knowledge is produced neither by the researcher nor by the system alone but emerges through a relation mediated by an additional element, such as a text in progress, a theoretical framework, a research problem, or another human actor. This element does not play a passive role but actively intervenes in the process, shaping and reorganising the trajectories of the research. Triangulation thus occurs when the interaction is no longer linear but mediated by a third element that transforms the relationship among the participants.

In the dialogues discussed above, this dynamic clearly emerges: the text guides reformulations, theoretical frameworks constrain the range of possible responses, and prior interaction becomes an object of analysis, thereby reshaping subsequent directions. In these cases, knowledge is located neither in the human agent nor in the artificial one, but in the relational space that opens up between them, pointing toward what Samuel (2026) describes as “epistemic co-agency”, a form of distributed epistemic agency emerging within entangled human–AI systems.

It is precisely within this configuration that a third space (Gutierrez, 2008) becomes visible, understood not as a mere mediation but as an emergent locus in which knowledge arises through the interaction between actors and artefacts. Within this space, positions of authority are distributed, trajectories are not predetermined, and the research process takes shape as a situated practice of negotiation.

Triangulation is therefore not a technique but an epistemic condition: knowledge emerges from the interplay between the human agent, the artificial agent, and the other actors and elements that mediate their relation, making visible the distributed and relational nature of knowledge production. Triangulation becomes a practice when the third actor does not remain implicit but is instead recognized and thematized, entering consciously into the process of knowledge construction.

3.2 The role of context

Another crucial yet often underestimated element concerns the role of context and subjectivity in shaping the interaction with the artificial agent. The GenAI’s responses are always tied to the specific context. By context, we refer not only to the content of the individual prompt but also to the set of conditions that structure the interaction: the

conversational history, the roles assumed by the participants, the linguistic modalities, and the frame of reference introduced by the human subject. In this sense, no response can be considered absolute but rather as something that emerges as the outcome of a situated relationship.

AI is not a universal source of knowledge but rather a situated agent whose outputs are sensitive to linguistic and interactional dynamics. While it is tied to the specific context of the interaction, AI tends to reproduce the regularities embedded in the data and models on which it has been trained. This dynamic does not stem from any intrinsic intentionality: AI is not a subject that pursues goals but a system that operates according to constraints, data, models, and optimization criteria, all of which are already imbued with the socio-economic and political order within which they were produced. In this sense, the artificial agent is functional to that order. More than through the specific content it generates, this function is exercised through the probabilistic logics and patterns of coherent completion by which it organizes, selects, and returns knowledge.

Precisely because it is bound to context, AI does not have the capacity to produce ruptures with respect to the field of possibilities that structures it: it can reorganise and recombine what already exists but remains inscribed within the framework that defines it, thereby fostering interpretive and discursive stances that tend to stabilize the existing order.

Unlike AI, the human subject can, and indeed must, step outside the interaction, suspend the dialogic flow, and adopt a meta-reflexive position, that is, take distance from the interaction itself and relate it to other contexts, *dispositifs*, and practices of knowledge. It is precisely within this excess in relation to the system that the possibility emerges to verify conclusions, exercise critical judgment, and validate what has been produced against disciplinary frameworks, empirical evidence, and interpretive communities. The production of knowledge is therefore not limited to interaction with the artificial agent but is realized in the subject's capacity to engage with it, interrupt it, and rework it in relation to broader frameworks of reference. This stepping back from the interaction is both a possibility and a necessity: not merely an operational condition, but an ontological requirement and a political choice, in that it opens up the space to avoid the automatic reproduction of the existing order and to reactivate forms of judgement and action.

3.3 Research and productivity: saving time for what?

The temporal dimension represents a key issue in the current transformations of educational research. The computational speed of generative AI introduces a temporal

asymmetry that deeply affects the rhythms of research and the modalities of interaction with data.

The use of AI in research is often advocated for or justified in terms of efficiency, as a tool to accelerate processes that have traditionally been time-consuming. However, this emphasis on time saving is situated within a context marked by increasing bureaucratization and the productivist logic of the academic system (Burrows, 2012; Driessens; Pischetola, 2024). In this scenario, research tends to be evaluated primarily in terms of quantity and output, rather than for its epistemological and transformative scope within educational contexts. As a result, the promise of “saved time” often risks functioning less as a form of liberation and more as a device for reallocating time within circuits of productivity.

Recent empirical evidence further complicates this linear narrative of efficiency. Studies on AI-assisted work show that a significant portion of the time apparently saved is in fact reabsorbed into activities of verification, correction, and reworking of generated outputs (Sheridan, 2026). At the same time, a marked misalignment emerges between managerial perceptions of increased productivity and the concrete experience of workers, who often do not report an actual saving of time (Binder, 2026). In some cases, the introduction of AI may even slow down processes, increasing the complexity of operational and cognitive practices (Goldsmith-Pinkham, 2026). The direct correspondence between the use of AI and a reduction in working time, therefore, does not hold; rather, it is more appropriate to speak of the role of AI in the reconfiguration of time, rhythms, and the distribution of work.

The introduction of AI may therefore reinforce already existing productivist dynamics, contributing to a further acceleration of rhythms without necessarily improving the quality of the knowledge produced. Delegating to AI operations traditionally considered time-consuming, such as literature reviews, synthesis, text writing, or data analysis, may in fact entail a form of cognitive deprivation. These activities are not merely technical steps but constitute central moments in the process of knowledge construction.

As highlighted in the first part of this contribution, any delegation of processes to AI is never neutral: it introduces models of thought organization and interpretive logics that may not be consistent with the researcher’s theoretical framework, thereby reducing the role of the human agent in the construction of knowledge. In this sense, time-saving cannot be considered a neutral indicator of efficiency, but must be examined in relation to the qualitative transformations it produces in cognitive and epistemic processes.

The temporal question thus reveals itself to be ambivalent. On the one hand, a significant reduction in time appears possible only through extensive delegation, which, however, entails a loss of control and awareness over the process. On the other hand, a more engaged interaction with AI, understood not as a simple request for outputs but as a dialogical practice, requires time, slows down the process, and implies the active involvement of the researcher. From this second perspective, time is not reduced but transformed: from operational time to reflective time, from time of execution to time of inquiry. Time saving thus appears as a local effect, often offset, or even nullified, by an increase in the complexity of managing the overall process. Selwyn emphasizes the need to move beyond what Campolo and Crawford (2020) define as “enchanted determinism,” that is, the belief that AI systems are at once opaque and superhuman, yet sufficiently reliable to be entrusted with significant decisions.

A fundamental question ultimately remains open: how should any “saved” time be used? As Stiegler (2016) suggests, the risk is that such time is reabsorbed by the system into bureaucratic and routine activities, thereby reinforcing processes of automation and the deprivation of the human. More recent analyses of AI-assisted work confirm this tendency: the time freed up rarely translates into greater autonomy or spaces for reflection but is often reintegrated into productive workflows (Foss, 2026; Huffington, 2025). Alternatively, it may be redeployed for processes of “disautomation”, that is, to reactivate reflective, creative, and critical practices that expand the researcher’s capacity for dialogue with other actors. The question of time and AI, therefore, does not simply concern the extent to which AI accelerates research but rather the kind of temporality it helps to produce: a temporality oriented toward the compression and standardization of processes, or one capable of sustaining slower, more situated forms of thought and reflection.

4 Conclusions

The perspective proposed in this contribution is, for the researcher, far from reassuring: it is complex and demanding in terms of both time and resources. In recent years, the use of generative AI has appeared to offer a possible solution to the difficulties associated with research. As it has evolved in its functions and reliability, it has gradually taken on the role of a virtual research assistant, and LLMs have been described as tools capable of accelerating literature reviews, synthesizing texts, and supporting the production of research materials. Many of these promises, however, have not been fulfilled, as also highlighted in studies on hybrid *dispositifs* (Pentucci *et al.*, 2025), and the introduction of AI cannot be

understood solely in terms of support or efficiency. Rather, it intervenes in the very configuration of research practices, reshaping the ways in which data are selected, navigated, and made meaningful.

At least two lines of risk emerge. The first concerns the tendency toward simplification: data pre-processed by AI does not coincide with the situated complexity of empirical data but is the result of processes of selection and normalisation that may reduce its interpretive density. The risk is that precisely the plurality of meanings that hybrid methodologies seek to bring to light may be lost. The second concerns delegation: entrusting AI with the identification of analytical pathways or processes of conceptualisation may reduce the researcher's direct involvement, shifting elsewhere decisions that are constitutive of the research process itself.

These risks, while real, also generate contradictions that can foster the emergence of micro-spaces of resistance. This occurs, in particular, when interaction is not oriented toward the production of answers or syntheses but toward the generation of questions grounded in the data themselves, thereby activating a reflective and conversational process.

In increasingly hybrid and plural research contexts, in which the production of knowledge involves both human and non-human actors, the concept of triangulation also requires redefinition. If AI is considered merely as a technical tool, its role remains limited, and its deeper implications are obscured. When instead approached from a more-than-human and ecosystemic perspective, it takes shape as a sparring partner, an agent embedded within dynamics of power and knowledge production. In a Foucauldian sense, AI does not act only as a constraint but also as an opening of spaces. This implies moving beyond dichotomies that are now inadequate in favour of a situated, hybrid, and processual perspective, in which data analysis itself takes shape as a dynamic, adaptive, and contextual activity. Not only do macro-micro and qualitative-quantitative distinctions appear increasingly difficult to apply to contemporary research but so too does the clear separation between phases of immersion and distancing. In the interaction between generative AI and human agents, a productive tension emerges between immersion and distancing. Knowledge is thus produced through the interplay of these two dynamics: on the one hand, immersion, which fosters the emergence of the new; on the other, distancing, which, through a reflective gaze, enables the critical reworking of co-constructed content. Immersion and distancing are therefore not separate phases but complementary movements that shape the dialogic space of the research. These functions may be assumed alternately by the two actors, whose roles are inherently hybrid and relational.

AI is no longer considered as a holder of answers but as an agent within a dialogical process (Wegerif; Casebourne, 2025) aimed at the co-construction of meaning. This shift requires moving beyond a logic of epistemic agency delegation in favour of the creation of dialogical spaces and possibilities, in which positions of authority are continuously negotiated.

Following Stiegler, this relation should be understood as a *pharmakon*: while it enables new forms of exploration and analysis, AI simultaneously tends to impose its own logics and to implicitly orient the trajectories of research. This is where triangulation takes on an ontological significance: it emerges as a critical and reflective practice through which the researcher can not only integrate but also critically examine the contributions of the various stakeholders involved, thereby keeping the epistemological and political space of educational research open.

The point isn't whether AI produces correct answers, but whether it can be used to re-examine the conditions under which questions are asked and knowledge is formed. Research involving AI does not function as an acceleration of thought, but as its articulation through varying rhythms of engagement and suspension.

References

- BINDER, M. Does AI save time? Executives say yes, employees say no. *Mashable* [online], 22 Jan. 2026. Available at: <https://mashable.com/article/ai-report-time-saved-workplace-executives-workers>. Accessed: 13 Apr. 2026.
- BURROWS, R. Living with the h-index? Metric assemblages in the contemporary academy. *The Sociological Review*, v. 60, n. 2, p. 355-372, 2012.
- CAMPOLO, A.; CRAWFORD, K. Enchanted determinism: Power without responsibility in artificial intelligence. *Engaging Science, Technology, and Society*, v. 6, p. 1-19, Jan. 2020.
- CAPOLLA, L. M.; GIANNANDREA, L.; GRATANI, F.; PENTUCCI, M.; ROSSI, P. G. Rethinking and formalizing initial teacher training on learning design for and in uncertainty. *Frontiers in Education*, v. 9, art. 1268936, 2024.
- COULDRY, N.; MEJIAS, U. A. Data colonialism: Rethinking big data's relation to the contemporary subject. *Television & New Media*, v. 20, n. 4, p. 336-349, 2019.
- CRAWFORD, K. *Né intelligente, né artificiale: il lato oscuro dell'IA*. Bologna: Il Mulino, 2021.
- DRIESSENS, O.; PISCHETOLA, M. Danish university policies on generative AI: Problems, assumptions and sustainability blind spots. *MedieKultur: Journal of Media and Communication Research*, v. 40, n. 76, p. 31-52, 2024.

- FOSS, N. J. AI, knowledge and the reorganization of university research. *Notes from a strategy scholar* [online], 21 Mar. 2026. Available at: <https://nicolajfoss.substack.com/p/ai-knowledge-and-the-reorganization>. Accessed: 13 Apr. 2026.
- FOUCAULT, M. Au-delà du bien et du mal. *Actuel*, n. 14, 1971.
- GOLDSMITH-PINKHAN, P. Research in the time of AI. *A causal affair* [online], 16 Mar. 2026. Available at: <https://paulgp.substack.com/p/research-in-the-time-of-ai>. Accessed: 13 Apr. 2026.
- HERBRECHTER, S. Unlearning to be human? The pedagogical implications of twenty-first-century post-anthropocentrism. In: HAYLER, M.; DAIGLE, C. (eds.). *Posthumanism in practice*. London: Bloomsbury Publishing, 2023. p. 212-226.
- HERRMANN, T. AI as a sparring partner – An HCAI approach to promote human capabilities. In: DEGEN, H.; NTOA, S. (eds.). *Artificial Intelligence in HCI*. Cham: Springer, 2025. p. 162-176.
- HUFFINGTON, A. *AI will save us time: the real question is what we'll do with it* [online], 24 Oct. 2025. Available at: <https://fortune.com/2025/10/24/ai-will-save-us-time-the-real-question-is-what-well-do-with-it-arianna-huffington/>. Accessed: 13 Apr. 2026.
- LATOUR, B. *Reassembling the social*. Oxford: Oxford University Press, 2005.
- JANDRIĆ, P.; KNOX, J.; BESLEY, T.; RYBERG, T.; SUORANTA, J.; HAYES, S. Postdigital science and education. *Educational Philosophy and Theory*, v. 50, n. 10, p. 893-899, 2018.
- MOROZOV, E. *Will tech giants move on from the internet?: now we've all been harvested* [online], 28 Jan. 2018. Available at: <https://www.theguardian.com/technology/2018/jan/28/morozov-artificial-intelligence-data-technology-online>. Accessed: 13 Apr. 2026.
- MULDOON, J.; WU, B. A. Artificial intelligence in the colonial matrix of power. *Philosophy & Technology*, v. 36, n. 4, p. 1-24, 2023.
- PENTUCCI, M.; GIANNANDREA, L.; CAPOLLA, L. M.; GRATANI, F.; ROSSI, P. G. Dispositivi ibridi per la formazione e la ricerca didattica nel postdigitale. In: DIPACE, A.; RAVIOLO, P. (eds.). *New literacies: nuovi linguaggi, nuove competenze*. Brescia: Scholé - Editrice Morcelliana, 2025. p. 219-230.
- PICKERING, A. The mangle of practice: Agency and emergence in the sociology of science. *American Journal of Sociology*, v. 99, n. 3, p. 559-589, 1993.
- PISCHE'TOLA, M. *et al.* Reclaiming micro-spaces of agency and network generativity in higher education. In: LANDRI, P.; PERUZZO, F. (eds.). *More-than-human education governance: new materialisms and education policy*. Cham: Springer, 2026.
- SAMUEL, A. Learning with machines: toward a theory of epistemic co-agency. *Computers and Education: Artificial Intelligence*, v. 10, e100573, jun. 2026.

- SHERIDAN, L. *AI promised to save time, researchers say it's doing the opposite* [online], 10 Feb. 2026. Available at: <https://www.inc.com/leila-sheridan/ai-promised-to-save-time-researchers-just-said-its-doing-the-opposite/91300530>. Accessed: 13 Apr. 2026.
- SRNICEK, N. *Platform capitalism*. Cambridge: Polity Press, 2017.
- STIEGLER, B. Relational ecology and the digital pharmakon. *Culture Machine*, v. 13, p. 1-16, 2012.
- STIEGLER, B. *Automatic society*. Cambridge: Polity Press, 2016.
- TAN, J. S.; THELEN, K. Cloud capitalism and the AI transition. *Politics & Society*, v. 40, v. 2, p. 184-214, 2025.
- TERRANOVA, T. *After the internet: digital networks between capital and the common*. Cambridge; London: MIT Press, 2022.
- TERZIS, P. Law and the political economy of AI production. *International Journal of Law and Information Technology*, v. 31, n. 4, p. 302-330, 2023
- VERDEGEM, P. Dismantling AI capitalism: the commons as an alternative to the power concentration of Big Tech. *AI & Society*, v. 39, n. 2, p. 727-737, 2024.
- WEGERIF, R.; CASEBOURNE, I. A dialogic theoretical foundation for integrating generative AI into pedagogical design. *British Journal of Educational Technology*, v. 57, p. 639-654, 2025.

Language revision: Ananda Missailidis

Submission date: 14/04/2026

Approval date: 07/06/2026