



When the Algorithm is the Message: GenAI as Educational Environment

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Abstract

This article addresses the impact of generative artificial intelligence (GenAI) on education from a media ecology perspective. GenAI configures a new linguistic environment that alters the conditions under which knowledge is produced, circulated, and validated. Far from being limited to the automated generation of content, these systems reorganize attention, accelerate information flows, and displace traditional practices of authorship and learning. GenAI must be understood as a media environment transformation rather than a specific pedagogic tool. McLuhan's notion that "the medium is the message" drives us to consider the structural effects this technology produces on perception, cognition, and the social organization of learning, more than focusing on the contents it creates. The analysis highlights how algorithmic mediation introduces an epistemological shift that challenges pedagogical models centered on the transmission and control of content. In response to this scenario, the article proposes algorithmic literacy as a central axis of education. Such literacy aims to strengthen agency and critical understanding in digital environments. It also seeks to enhance the capacity to construct meaning in educational contexts shaped by automated systems.

Keywords: GenAI, language, environment, teaching-learning practices, algorithmic literacy

In their early stages, the success of social networks was intrinsically linked to user participation in content creation. Social networks provided a sort of predetermined template designed to facilitate this process. The current media ecology is characterized by hyperconnectivity and the existence of big data repositories. The expansion of the platformization of content production and consumption resulted in an increase of the demand for content. And ChatGPT was there to meet it.

We had already been incorporating automation into our daily practices: filters, management and scheduling tools, recommendation algorithms, etc. Daniel Innerarity notes that "algorithmic rationality, rather than representing an absolute rupture with the past, can be analyzed according to historical continuities... Some have traced interesting precedents with calculation in the Babylonian empire (Innis 1986), that is, whenever it has been necessary to establish order in an environment of complexity and heterogeneity. Many of the practices of algorithmic control by states or economic actors were already present in the Babylonian empire, in the beginnings of the modern State and early capitalism" (2024, p. 18).

If algorithmic systems are historically continuous, then what distinguishes GenAI is not automation itself, but the level at which it operates. Like writing or printing, GenAI is a medium that extends language, in other words, a form of encoding. The Large Language Models (LLMs) that fuel this technology expand human encoding capacity, conceived as the ability to construct textual, auditory, and visual representations. Moreover, we consider GenAI as a new form of cultural and social technology that enables human beings to harness

the information accumulated by others over time. Like all technological change, which entails new modes of practice, uncertainty, and professional transformation, technophobic and technophilic stances reemerge. We may be witnessing a new iteration of the fourth discontinuity that Bruce Mazlish discussed in his book, *The Fourth Discontinuity: The Co-Evolution of Humans and Machines*, where he argued that we are not very different from machines and that "...transcending the fourth discontinuity is essential to fit harmoniously into an industrialized world" (1995, p. 200). Today we would say, digitalized, in a platform society.

This reclassification places GenAI squarely within the tradition of media theory. From this perspective, we can easily speak of a shift in scale and speed. As early as 1964, Marshall McLuhan in *Understanding Media: The Extensions of Man* warned us that "the message of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs" (1964, p. 24). This insight assumes particular significance when we examine the impact of Generative AI as an environment on our communicational ecosystem.

The influence of Generative AI and algorithms on consumption poses new questions regarding the role of shared cultural experiences within an increasingly individualistic social landscape. Recommendation and personalization algorithms contribute to the fragmentation of the collective cultural experience that has traditionally bound societies together through common reference points, shared narratives, and synchronous media consumption.

As a medium for language extension, GenAI is characterized by its ontological nature (Aguado-Terrón and Grandío-Pérez, 2024); that is to say, it affects how we construct a shared world. This entails a significant cultural shift, perhaps an anthropological mutation whose implications are difficult to anticipate.

Neil Postman in *Technopoly: The Surrender of Culture to Technology* acutely synthesizes the moment we are living through, noting that: "Every technology is an expression of human will. It is imbued with our ideas about how we should use our minds and our bodies, about what knowledge is important, about which of our senses should be extended and which should remain dormant" (1993, p. 175).

The New Educational Environment

To conceptualize GenAI as an extension of language requires, first and foremost, acknowledging the constitutive nature of language itself. As Cassirer observes, "language converts chaos into form... it articulates chaotic reality into a world of relations from the very first moment" (1973, p. 15). This determinative and discriminating function of language in the construction of our world cannot be understood as an instrument of communication, but rather as the very condition of possibility for a shared world. Language is that series of distinctions that enable us to live and act together. In this sense, following Gadamer (1977), we must recognize that language is not simply one of the provisions with which man is

equipped as he exists in the world, but rather that it is language itself that enables human beings to have a world. The existence of the world is thus linguistically constituted.

Language is not a simple medium for transmitting information but rather the environment in which we live. Human beings do not *use* language; we actually *dwell* within it. Seen from this perspective, the significance of GenAI becomes clearer. In this light, this distinction is crucial for understanding the nature of GenAI: it is not a tool we employ for specific purposes, but rather a *linguistic environment* where our practices of thinking, writing, and learning increasingly take place.

The human-machine relationship in the context of GenAI unfolds precisely at the interface, experienced as a world where the software user perceives, acts, and responds to experiences. This interface is not a simple point of contact between two separate entities, but rather the site where a new modality of linguistic existence is constituted (Comba y Toledo, 2004). In this sense, GenAI recovers the immediacy and adaptability of the oral tradition in the digital age. Just as in the past oral narrative adapted instantaneously to the audience, GenAI can adjust content based on user input in real time, reviving the dynamic and interactive nature of interpersonal communication. It also recovers interdisciplinary thinking, insofar as GenAI can process and integrate information from diverse fields, reminiscent of the era prior to disciplinary specialization. These characteristics prompt a reconsideration of what matters pedagogically.

If we accept that GenAI constitutes a linguistic environment where we dwell, then the McLuhanian distinction between medium and content acquires a renewed importance. The critical shift, as indicated by the context in which these technologies have emerged moves "from policing content to interrogating process" (Martinisi, 2025). *The medium is the message* is more relevant than ever in the current educational context.

As Lance Strate observes, the concept of medium can "represent practices and processes, not just materials and mechanisms" (2017, as cited in Petricini, 2024, p.99). From this perspective, media -from traditional forms to emerging digital platforms- encompass any technology that extends human capabilities and influences our interaction with the world. GenAI, in its capacity to extend collective knowledge and thought in a language that simulates human conversation, represents the most recent iteration of this phenomenon.

But if GenAI is an environment (a medium), then its *message* does not reside in the texts it produces, in the essays it generates, or in the answers it provides. The message lies in how it fundamentally reconfigures the processes of teaching and learning. The relevant question is not whether the text produced by a student with the help of GenAI is *authentic* or *plagiarized* -that is a question that remains anchored in the content paradigm. Framed this way, content-based concerns appear secondary. The central question is how GenAI transforms the very processes of thinking, understanding, and learning.

The pedagogical consequence of recognizing the *medium as message* is that we must shift our critical attention. It is not a matter of developing increasingly sophisticated detectors of AI-

generated content, but rather of designing learning experiences that consciously leverage the transformations that this new linguistic environment makes possible.

The fundamental problem of artificial intelligence does not lie in its technical capabilities or in the quality of its outputs, but rather in the growing externalization of human decisions that its widespread adoption entails. Automation, in this context, poses an unavoidable question: what place corresponds to human decision-making when we operate in environments where thought processes can be delegated to automated systems? Is it simply a supplement that amplifies our capabilities, a modification that transforms our processes, or a replacement that displaces us from cognitive roles we previously considered constitutive of the human?

Resisting GenAI as a linguistic environment is as futile as resisting language itself. That is why the contemporary educational challenge consists in cultivating the human capacities necessary to consciously inhabit that environment. This means developing in students technical competencies (how to use AI effectively) and, above all, metacognitive and ethical capacities: how to recognize when they are exercising decision-making and when they are delegating it, how to evaluate the consequences of that delegation, and how to maintain cognitive agency in an environment that facilitates its externalization.

McLuhan taught us that media transform not only what we do but how we do it and, ultimately, who we are. Understanding GenAI as an environment allows us to navigate that transformation in order to design educational experiences that respond to the needs of the era.

Learning and Teaching with GenAI

The intensive use of digital technologies produced a double decentering of knowledge (Barbero, 1998). Knowledge became decentered in two ways: from the institutions that traditionally monopolized learning (schools, universities, institutes, etc.) and from book technology, which had constituted, since the advent of the printing press, the privileged and unquestioned axis of access to knowledge. In the twenty-first century, non-formal instances through which we acquire knowledge have multiplied, largely enabled by platforms that have expanded cultural consumption.

The question of knowing is ancient. Throughout history and across different disciplines - philosophy, psychology, cognitive science, biology, pedagogy, and others various responses have been proposed. Today, GenAI serves as a medium, language, or environment in which learning and teaching practices take place. From the media ecological perspective, Lance Strate notes that Postman used the term medium as a synonym of communication technology, and McLuhan used the terms media, technology, and language interchangeably (2017, as cited in Petricini, 2024).

In this platform society, is necessary to bear in mind that the mental functions involved in knowing originate in social and communicative processes. Therefore, coming to know

something—to acquire knowledge—is a situated action, part of a continuum within a cultural world. It does not depend solely on individual factors such as dispositions, traits or motives that reside in the knower's mind. Rather, it entails a construction that is always negotiated with others. Moreover, knowing is a process distributed across “...the books with underlined passages that we store on our shelves, the manuals we have learned to consult, the information sources we have connected to our computer, the friends we can turn to for a reference or advice” (Bruner, 2006, p.p. 106-107). Similarly, and in an excellent synthesis, Howard Gardner states “...my intelligence does not end at my skin; rather, it encompasses my tools (paper, pencil, computer), my documentary memory (contained in files, notebooks, and journals), and my network of acquaintances (office colleagues, professional peers, and other individuals I can telephone or contact through electronic means)” (1994, p. 13).

Along these same lines of thought, theorists from different disciplines and traditions such as Gregory Bateson and Vygotsky propose that the mind extends beyond the skin. Consequently, mental activities such as memory, reasoning, etc., cannot be understood as separate from the mediating artifacts employed in knowing.

In teaching-learning practices, operational schemas come into play through which subjects activate their cultural competencies and construct meaning. (Toledo y Comba, 2008). Cultural competencies include not only formal education in its various modalities - specialized knowledge- but also other forms of knowledge and narrative memories, gestural repertoires, and the imaginaries that shape subjectivity.

According to Petricini (2025), historically, meaning-making, from oral traditions to print culture, was rooted in human agency, with communities actively shaping narratives and controlling the flow of ideas. Nowadays, algorithmic systems not only dictate which knowledge is surfaced but also reconfigure the conditions under which meaning is produced and interpreted. Petricini notes that “these systems, often designed with efficiency and engagement as priorities, operate through opaque mechanisms that obscure their influence on our perceptions and interactions. Algorithmic literacy, unlike traditional AI literacy, aligns with the postdigital ethos by not only enabling individuals to understand and use AI tools but also to critically interrogate the algorithmic structures that govern information flows, influence perceptions, and shape societal narratives. It challenges the binary of human versus machine, instead proposing an understanding of how algorithms act as mediators of meaning and power. This deeper, more systemic approach to literacy is essential for navigating an era where algorithms are not just tools but active participants in the creation of meaning and the construction of our shared realities. Algorithmic literacy can address the profound epistemic shift in how knowledge is produced, distributed, and consumed in an algorithm-driven world” (Petricini, 2025, p. 1306).

GenAI can be understood as an algorithmic mediation, that is, a set of automated processes that organize, hierarchize, and personalize access to knowledge. These mediations do not operate in a neutral manner; rather, they incorporate technical, economic, and cultural criteria that shape the educational experience. From this perspective, GenAI does not replace the teacher or the student; rather, it intervenes in the construction of meaning, conditioning which

forms of knowledge become visible, how they are presented, and under what logics of validation. The risk lies not in automation itself, but in the naturalization of these mediations and in their cultural and political opacity. This is why algorithmic literacy is essential: a literacy that enables subjects to understand how GenAI responses are produced, what data and logics intervene in its functioning, and what economic and political interests underpin it.

Professor Alessandro Martinisi (2025) observes that “it’s tempting to focus on whether the AI got the facts right, or whether it’s too cookie-cutter. But McLuhan trained me to see that content is often a smokescreen. The real action is in how the tool shapes cognition and perception. So I ask students: where did the AI get stuck or overreach? What biases leak into its *knowledge*? What does it not say? We compare versions, reverse engineer prompts, and probe the logic that the machine seems to follow. Over time, students begin to see that an AI output is less a product than a negotiation with a medium. That realization alone is, I think, a new form of literacy”

As Petricini (2025) observes, this approach to literacy goes beyond operational knowledge to encompass a critical awareness of how digital systems mediate our world, relationships, and identities and, in so doing, shape reality, influence perception, and structure our interactions with information. In McLuhan's words, the message of GenAI is that literacy today is unfolding in a totally new environment. And that is what really matters.

Conclusion

Taken together, these arguments suggest that the educational challenge posed by GenAI is not primarily technical, but communicative and political. The emergence of GenAI demands we rethink the very foundations of educational practice. This article has argued that the most productive approach is to focus not on content detection or institutional prohibition, but rather on a recognition of *GenAI as a linguistic environment* that fundamentally reconfigures how knowledge is produced, circulated, and validated.

McLuhan's insights are crucial to understanding this moment. When we recognize that *the medium is the message*, we shift our attention from what GenAI produces to how teaching and learning processes unfold.

That is why GenAI is not an automatic solution to educational problems, but rather an environment where tensions are negotiated between standardization and diversity, control and autonomy, efficiency and cultural recognition. Consequently, the task of education is to recover its communicative and political dimension by mediating between algorithmic knowledge and human experiences and by promoting pedagogical practices that integrate GenAI while attending to dialogue and the collective construction of meaning.

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