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Beyond the Fear of Innovation Through the Hybridization of Learning Spaces

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Abstract: Rather than framing AI Literacy as a predefined set of technical competences, this contribution interprets it as an educational experience emerging from the interaction between subjects, environments, and technologies. Considering Dewey's concept of experience, learning is approached as a situated and continuous process, shaped not merely by the availability of technological tools, but by the quality of educational design. From this perspective, artificial intelligence is not considered as a neutral instrument, but as a constitutive element of contemporary learning environments, capable of orienting meaning-making processes, participation, and agency in non-linear and sometimes unpredictable ways. The paper discusses how AI-mediated learning spaces may either support or limit educational growth, depending on how they are intentionally designed, inhabited, and critically reflected upon within pedagogical practice.

Keywords: AI Literacy; Educational Experience; Learning Spaces

1. Introduction

The contemporary era is marked by profound transformations simultaneously affecting technological, cultural, and educational dimensions. Several scholars have described this historical phase as a genuine "civilizational leap," characterized by an unprecedented acceleration of innovation processes. Digital technologies, and more recently Artificial Intelligence, have permeated everyday life and educational practices, reshaping how individuals communicate, access information, and construct meaning (Fabiano, 2021; Dewey, 1938).

This acceleration, however, is not automatically accompanied by an equivalent capacity for understanding and critical elaboration. The widening gap between the long timescales of human biological and cultural evolution and the rapid pace of socio-technical change often generates disorientation, uncertainty, and fear. In educational contexts, these sentiments tend to crystallize into emergency-driven narratives, in which technology is framed as a threat to attention, relational depth, and cognitive development (Bauman, 2017).

As Bauman has argued, when the future appears unstable and difficult to imagine, societies often turn backward, producing forms of Retrotopia in which the past is idealized as a space of certainty and protection. This cultural dynamic strongly in-

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fluences educational discourse, encouraging defensive attitudes toward innovation, particularly within institutional school settings. Technologies become symbolic targets on which broader anxieties about change, control, and loss of meaning are projected (Bauman, 2017; Maceratini, 2018).

Debates surrounding educational technology thus tend to polarize around two opposing positions. On one side, a technophobic stance promotes restriction, control, or exclusion of digital tools as strategies of protection. On the other, a technosolution approach attributes salvific power to technology, delegating to it the resolution of deep-seated educational problems. Both positions prove insufficient, as they reduce technology either to a threat or to a remedy, overlooking its fundamentally human, cultural, and situated character (Rivoltella, 2017; Fabiano, 2021).

The contemporary educational challenge, therefore, does not lie in deciding whether to accept or reject innovation, but in understanding how innovation reshapes the very conditions of educational experience. Moving beyond fear requires a reconsideration of learning models, renewed attention to corporeality, and a critical reflection on learning spaces—not merely as physical settings, but as relational, symbolic, and experiential environments (Dewey, 1938; Indire, 2019).

2. Embodied Cognition as a Compass for Educational Innovation

Approaching technological innovation in education in a non-ideological way requires questioning the anthropological and cognitive assumptions that underpin dominant models of learning. For a long time, educational discourse has been influenced by mentalistic and cognitivist perspectives that tend to separate mind from body, knowledge from action, and learning from context. Within such frameworks, cognition is often conceived as an internal, abstract, and largely decontextualized process, while the body is relegated to a marginal or instrumental role (Di Tore & Sibilio, 2016; Rivoltella, 2017).

In the recent decades, however, interdisciplinary research in neuroscience, cognitive science, psychology, and pedagogy has progressively challenged this view. The perspective of embodied cognition has shown that thinking does not occur exclusively within the brain, but emerges from the dynamic and continuous interaction between brain, body, and environment. From this standpoint, cognition is inherently situated, action-oriented, and relational. Learning, therefore, entails acting in the world—moving, perceiving, manipulating, and responding to situations through bodily engagement—rather than merely processing information in an abstract manner (Di Tore, 2019).

Educational experience, considered in this sense, cannot be reduced to the transmission of content or the acquisition of formal competencies. It takes shape as a complex process of meaning construction grounded in lived experience, sensory engagement, and social interaction. As highlighted by educational studies on embodied learning, perception, action, and cognition form an integrated system through which individuals make sense of their surroundings and of themselves within those surroundings (Dewey, 1938; Di Tore & Sibilio, 2016).

A central dimension of this framework is human neoteny. Human beings are born biologically incomplete and remain dependent on others for survival and development over an extended period. This prolonged dependency has profound educational implications. It has fostered the development of relational, communicative, and empathic capacities, making learning intrinsically social and intersubjective.

Cognitive development unfolds within networks of interaction, care, and shared activity, reinforcing the idea that knowledge is never purely individual, but always co-constructed within a social and cultural context (Gallese & Morelli, 2024).

Within this relational horizon, the body plays a crucial epistemic role. Far from being a mere vehicle for the mind, the body constitutes a primary medium through which experience is organized and interpreted. Gestures, posture, movement, and sensory feedback contribute actively to cognitive processes, shaping attention, memory, and understanding. Neuroscientific research has further shown that linguistic structures share neural bases with motor planning, suggesting that abstract reasoning and symbolic thought emerge from embodied action rather than preceding it (Gallese & Morelli, 2024).

These insights carry significant implications for educational practice. School models that privilege stillness, prolonged immobility, and passive reception of information risk contradicting the very conditions under which learning occurs. When the body is constrained or ignored, opportunities for exploration, experimentation, and meaningful engagement are reduced. In contrast, learning environments that value movement, interaction, and multisensory experience are more consistent with the embodied nature of cognition (Gallese & Morelli, 2024; Gallese et al., 2025).

Viewed through this lens, educational innovation cannot be confined to the introduction of new technological tools or digital devices. Technologies acquire educational significance only when they are integrated within educational designs that respect the embodied, situated, and relational character of learning. Without such integration, technological innovation risks reproducing disembodied models of cognition, even when presented as progressive or innovative (Fabiano, 2021; Di Tore & Sibilio, 2016).

Embodied cognition therefore functions as a conceptual compass for educational innovation. It provides criteria for evaluating not only how technologies are used, but also how learning environments are designed, how teaching practices are structured, and how learners are positioned within educational processes. By foregrounding experience, action, and relationality, this perspective invites educators to rethink innovation as a transformation of educational experience rather than as a mere technological upgrade (Dewey, 1938; Rivoltella, 2017).

3. Digital Technologies and Learning Environments: beyond *Technophobia*

From the standpoint of embodied cognition, digital technologies cannot be interpreted simply as sources of alienation or cognitive impoverishment. Interaction with digital devices engages perception, attention, and bodily action in new ways, reshaping how individuals relate to information and to one another. Screens increasingly function as interactive environments rather than passive visual surfaces, inviting touch, movement, and emotional involvement (Rivoltella, 2017; Gallese et al., 2025).

Technophobic narratives tend to overlook this complexity, attributing to technology a deterministic power. Digital tools are often portrayed as direct causes of distraction or isolation, without sufficient attention to the educational contexts and practices that shape their use. Such interpretations oversimplify the issue, shifting focus away from educational responsibility toward mere regulation or prohibition (Fabiano, 2021; Bauman, 2017).

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Within schools, this stance often generates defensive responses oriented toward control rather than accompaniment. The digital dimension is treated as an external intrusion rather than as an experiential domain to be educational inhabited. This produces a growing disconnect between students' lived experiences and institutional learning environments, undermining the relevance and meaning of schooling (Rivoltella, 2017; Fabiano, 2021).

Artificial Intelligence introduces an additional layer of complexity. Intelligent systems actively participate in selecting, organizing, and presenting information, thereby influencing how learners access knowledge, make decisions, and construct meanings. Reducing AI literacy to technical proficiency risks obscuring this transformative impact on educational experience.

Educational understood, AI literacy involves critical awareness of how intelligent technologies operate, recognition of their limits and ethical implications, and reflection on their influence on learning and relationships. It develops through dialogue, mediation, and critical engagement, rather than through standardized training alone (Fabiano, 2021; Dewey, 1938).

From this perspective, the central educational issue is not the exposure to technology, but the absence of intentional educational mediation. When technologies are embedded within thoughtfully designed learning environments, they can support participation, collaboration, and agency. Without such mediation, they risk reinforcing passivity or external control (Di Tore & Sibilio, 2016; Rivoltella, 2017).

4. The Hybridization of Spaces: Toward Flexible Learning Environments

If learning is embodied, relational, and situated, space itself assumes a crucial pedagogical role. School environments are not neutral containers, but active agents shaping behaviours, interactions, and forms of participation. Traditional classroom arrangements, characterized by rigidity and frontal orientation, implicitly reinforce transmissive models of teaching.

Research on learning environments emphasizes the value of flexible and modular spaces capable of supporting diverse activities and learning styles. Differentiated environments—spaces for collective discussion, laboratory exploration, individual reflection, and informal interaction—contribute to more inclusive and dynamic educational ecosystems (Indire, 2019; Dewey, 1938).

Within this framework, technology does not constitute the goal of innovation, but a means supporting educational inquiry. When integrated thoughtfully, digital tools enable collaborative practices, creative production, and shared knowledge construction. The teacher's role evolves accordingly, shifting from content transmitter to facilitator and designer of learning experiences (Fabiano, 2021; Rivoltella, 2017).

Hybridization also extends beyond the physical boundaries of school buildings. Connections with the surrounding territory, natural environments, and informal learning contexts enrich educational experience. The aesthetic quality of spaces, access to light and nature, and opportunities to encounter significantly influence well-being, motivation, and engagement (Indire, 2019; Morelli, 2024).

5. Discussion

The analysis developed in this contribution highlights how fear of technological innovation, frequently recurring in contemporary educational discourse, is rooted in a reductive conception of learning and a disembodied view of the mind. When learning is primarily interpreted as an abstract, individual, and cognitive process, technology is easily framed as a disruptive element, allegedly undermining attention, concentration, and the depth of educational experience. Within this perspective, Artificial Intelligence is often perceived as an external threat rather than as an internal component of contemporary processes of meaning-making (Bauman, 2017; Gallese & Morelli, 2024).

Re-situating AI literacy within the framework of educational experience allows this interpretive impasse to be reconsidered. If learning is understood as embodied, situated, and relational, intelligent technologies must be analyzed in relation to the practices, environments, and educational intentionalities that shape their use. AI literacy, therefore, cannot be reduced to a set of operational skills or functional competencies. Rather, it should be understood as a cultural and educational practice that develops over time through interaction among subjects, tools, and contexts, and through reflective engagement with technological mediation.

From this standpoint, AI-mediated learning environments may indeed expand educational possibilities by supporting personalization, accessibility, and new forms of participation. However, such potentialities are never neutral or automatic. Without intentional pedagogical design, technological innovation risks generating new forms of passive adaptation, technological dependency, or cognitive delegation. In these cases, technology does not enrich educational experience, but tends to substitute for it, narrowing the space for reflection, agency, and critical judgment.

A further critical issue concerns the relationship between technological innovation and control. Intelligent technologies, particularly when embedded within institutional educational settings, may be used to monitor, classify, and normalize student behaviours and performances. This raises significant educational and ethical questions, as learning environments risk being transformed into tools of surveillance rather than spaces of exploration, experimentation, and growth. The central issue, therefore, is not whether Artificial Intelligence should be used in education, but how and under what conditions it is integrated into educational practice (Gallese et al., 2025; Bauman, 2017).

These considerations point to a fundamental educational tension: how to pedagogically inhabit technologically complex environments without losing sight of the centrality of experience, embodiment, and relationality. This tension cannot be resolved once and for all through prescriptive models or standardized solutions. Instead, it requires continuous critical reflection, professional judgment, and the capacity to negotiate meanings within specific educational contexts.

From this perspective, fear of innovation can be reinterpreted not as an obstacle to be eliminated, but as a meaningful signal. It reveals the need for educational accompaniment capable of restoring orientation, sense, and intentionality within processes of transformation. When addressed critically, fear may function as a starting point for educational inquiry rather than as a barrier to change. Only by adopting such a stance can technological innovation be transformed from a source of anxiety and discontinuity into an opportunity for renewing educational experience and rethinking the purposes of schooling (Fabiano, 2021; Morelli, 2024).

6. Conclusions

Addressing educational innovation without yielding either to technophobia or to uncritical adherence to technology requires an intentional, reflective, and ethically grounded pedagogical stance. As argued throughout this contribution, Artificial Intelligence cannot be considered merely as an external support to educational processes, but rather as an element actively involved in shaping learning environments and the experiences that unfold within them. Its educational impact depends less on technological sophistication than on the quality of educational design and professional mediation (Fabiano, 2021; Dewey, 1938).

From this perspective, AI literacy appears less as a final goal to be achieved once and for all and more as an ongoing educational practice to be cultivated over time. It involves continuous processes of interpretation, negotiation, and critical reflection, through which learners and educators alike develop awareness of how intelligent technologies influence learning, decision-making, and relational dynamics. Such an understanding challenges purely instrumental approaches and emphasizes the formative dimension of technological engagement (Rivoltella, 2017; Di Tore & Sibilio, 2016).

Innovation, therefore, cannot be assumed as an inevitable destiny imposed by technological progress. Instead, it should be understood as an educational possibility to be critically constructed within concrete school practices. This construction requires time, professional responsibility, and the capacity to tolerate uncertainty, recognizing that not all educational questions can be resolved in advance through technical solutions.

Within this ongoing negotiation, schools may rediscover their role not as institutions tasked with protecting individuals from the future, nor as spaces of uncritical experimentation, but as environments that enable learners to inhabit a changing world responsibly. By foregrounding experience, embodiment, and relationality, education can reclaim its role as a space in which innovation is not feared or celebrated uncritically, but thoughtfully interpreted and pedagogically oriented toward human development.

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