

Artificial Intelligence (AI) in education: contributions from Historical-Cultural Psychology and Historical-Critical Pedagogy¹

Inteligência Artificial (IA) na educação:
Contribuições da Psicologia Histórico-Cultural e da
Pedagogia Histórico-Crítica

Inteligencia Artificial (IA) en educación:
aportes desde la Psicología Histórico-Cultural y la
Pedagogía Histórico-Crítica

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ABSTRACT

In this article, we critically analyze the insertion of Artificial Intelligence (AI) in education in light of historical-dialectical materialism, Historical-Cultural Psychology, and Historical-Critical Pedagogy, establishing a theoretical dialogue between the works of Goethel and Fonseca (2025) and Rodrigueiro et al. (2025). We organize the work into three sections: the first is dedicated to the contributions of Goethel and Fonseca (2025), emphasizing the risks of algorithmic mediation for the educational process; the second deals with the reflections of Rodrigueiro et al. (2025), emphasizing the irreplaceable role of teacher mediation; the third section establishes critical relationships between both works, discussing convergences and implications for an omnilateral human formation. Finally, we present our concluding remarks, in which we reaffirm the need for a critical appropriation of AI, subordinated to pedagogical proposals based on the humanization of subjects through the transmission and assimilation of historically systematized knowledge.

Keywords: Artificial Intelligence; Historical-Cultural Psychology; Pedagogical Mediation; Historical-Critical Pedagogy; Historical-Dialectical Materialism.

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RESUMO

Neste artigo, analisamos criticamente a inserção da Inteligência Artificial (IA) na educação à luz do materialismo histórico-dialético, da Psicologia Histórico-Cultural e da Pedagogia Histórico-Crítica, estabelecendo um diálogo teórico entre os trabalhos de Goethel e Fonseca (2025) e de Rodrigueiro et al. (2025). Organizamos o trabalho em três seções: a primeira dedica-se às contribuições de Goethel e Fonseca (2025), com ênfase nos riscos da mediação algorítmica para o processo educativo; a segunda trata das reflexões de Rodrigueiro et al. (2025), enfatizando o papel insubstituível da mediação docente; a terceira seção estabelece relações críticas entre ambos os trabalhos, discutindo convergências e implicações para uma formação humana omnilateral. Por fim, apresentamos as considerações finais, nas quais reafirmamos a necessidade de uma apropriação crítica da IA, subordinada a propostas pedagógicas pautadas na humanização dos sujeitos por meio da transmissão-assimilação dos saberes historicamente sistematizados.

Palavras-chave: Inteligência Artificial; Psicologia Histórico-Cultural; Mediação pedagógica; Pedagogia Histórico-Crítica; Materialismo Histórico-Dialético.

RESUMEN

En este artículo, analizamos críticamente la inserción de la Inteligencia Artificial (IA) en la educación a la luz del materialismo histórico-dialéctico, la Psicología Histórico-Cultural y la Pedagogía Histórico-Crítica, estableciendo un diálogo teórico entre las obras de Goethel y Fonseca (2025) y Rodrigueiro et al. (2025). Organizamos el trabajo en tres secciones: la primera está dedicada a las contribuciones de Goethel y Fonseca (2025), enfatizando los riesgos de la mediación algorítmica para el proceso educativo; la segunda aborda las reflexiones de Rodrigueiro et al. (2025), enfatizando el papel insustituible de la mediación docente; la tercera sección establece relaciones críticas entre ambas obras, discutiendo convergencias e implicaciones para una formación humana omnilateral. Finalmente, presentamos nuestras consideraciones finales, en las que reafirmamos la necesidad de una apropiación crítica de la IA, subordinada a propuestas pedagógicas basadas en la humanización de los sujetos a través de la transmisión y asimilación de conocimientos históricamente sistematizados.

Palabras clave: Inteligencia Artificial; Psicología Histórico-Cultural; Mediación Pedagógica; Pedagogía Histórico-Crítica; Materialismo Histórico-Dialéctico.

1 Introction

In this article, we critically analyze the inclusion of Artificial Intelligence (AI) in education from the foundations of Historical-Dialectical Materialism, Historical-Cultural Psychology, and Historical-Critical Pedagogy⁴. We start from the following research problem: what are the implications of the inclusion of Artificial intelligence in educational processes, considering the risks and possibilities that emerge for pedagogical mediation,

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human formation and the development of subjects?⁵ To answer this question, we adopt Historical-Dialectical Materialism as our method of analysis, comprehending AI as a phenomenon historically situated and produced within capitalist social relations, and shaped by multiple economic, political, cultural, and educational determinations.

We establish a dialogue here between the works of Goethel and Fonseca (2025), and Rodrigues et al. (2025), both published in DOSSIÊ “Tecnologias Digitais e Teoria Histórico-Cultural”, of *Obutchénie - Revista de Didática e Psicologia Pedagógica*. The analytical focus is justified by the relevance of the discussions developed in this dossier, which gathers contributions based on the Historical-Cultural Theory for the critical understanding of digital technologies and their implications for the field of education.

The article is organized as follows: first, we bring the contributions of Goethel and Fonseca (2025), with emphasis on the risks of algorithmic mediation for the educational process. Second, we discuss the considerations of Rodrigues et al. (2025), emphasizing the irreplaceable role of teacher mediation. Third, we build on these analyses on the topic, not in the sense of denying the use of AI in education, but rather to alert readers to the need for caution in light of the potential harm to the omnilateral formative process of subjects, in favor of a fragmented formation, guided by algorithms and detached from the process of humanization of subjects. We advocate an integral formation through access to historically systematized knowledge (Saviani, 2013).

We highlight throughout the paper that AI, as a cultural mediation historically situated, cannot be comprehended as a neutral tool, since it expresses social relations, economic interests, and concepts of education. Based on the contributions of Leontiev and other authors from the Historical-Cultural Tradition discussed in the texts considered here, we discuss the risk of eroding the personal meaning of learning and of the weakening of teacher mediation when pedagogical functions are delegated to algorithmic systems.

2 Between Algorithmic and Teacher Mediation

The article by Goethel and Fonseca (2025) addresses the incorporation of Artificial Intelligence (AI) into education, drawing on Historical-Cultural Psychology, especially the

⁵ During the preparation of this work, the artificial intelligence tool ChatGPT-4o was used to improve textual clarity. It is declared that all generated content underwent human curation and review, with the authors bearing sole responsibility for the information and arguments presented herein.

theoretical assumptions of A. N. Leontiev regarding the formation of human consciousness. The authors start from the understanding that educational processes are, in their essence, processes of cultural mediation, in which human activity plays a central role in the psychological development when guided by reason and the senses.

As mentioned by the authors, Leontiev (1978) explains that human activity is organized in three hierarchical levels: activity, action, and operation, which structure the relationship between consciousness, need, and social practice. Thus, activity constitutes the broadest level and is oriented by a motive that responds to the subject's need, giving meaning to their action in the world. Even when it is not fully conscious, the motive manifests itself by means of emotions and the transformations of the activity itself, being inseparable from the constitution of consciousness.

The second level is action, characterized by a conscious goal to be reached. Although the action is connected to the activity, its goal does not always coincide with the motive that originated it. Leontiev (1978) exemplifies this distinction with the act of going to the library: the goal is to arrive at the place, but the broader motive is the appropriation of knowledge. In this way, the same action may be part of different activities, demonstrating its relative autonomy.

Finally, operations correspond to the technical means and to the concrete conditions for executing the actions. They vary according to the context and tend to become automated with practice, which reduces the necessity for continuous conscious control. This process allows the action to become more fluid and integrated, as in the case of memorizing a poem, when different operations (repeating, copying, reciting) may be used according to the conditions (Leontiev, 1978).

In this context, Goethel and Fonseca (2025) discuss the growing presence of algorithmic systems in school and university routines, highlighting that AI does not limit itself to being a neutral tool for pedagogical support, but it begins to occupy traditionally human functions, such as the organization of teaching, the personalization of learning, and the evaluation of student performance (Goethel and Fonseca, 2025). Such displacement raises questions regarding the formative implications of this technology.

The analysis is also based on Leontiev's distinction between social meaning and personal sense. According to Leontiev (1978), social meaning refers to the culturally stabilized content of human activities, whereas personal sense emerges from the living

relationship of the subject with these activities, mediated by their own reasons and needs. Goethel and Fonseca (2025) argue that this distinction is crucial for evaluating the impacts of AI on educational processes.

In other words, while social meaning corresponds to the contents and practices historically consolidated within educational activity, personal sense relates to the way these contents are experienced and appropriated by subjects, according to their motives, needs, and concrete conditions of life.

From this theoretical framework, the authors problematize the risk that algorithmic mediation may reduce the educational experience to the assimilation of ready-made meanings, dissociated from the concrete life of subjects. When pedagogical decisions are delegated to automated systems, there is the possibility of emptying the personal meaning of learning, since students come to relate more to technical prescriptions than to socially meaningful activities (Goethel and Fonseca, 2025).

We can relate the contribution of these authors to that of Sforni *et al.* (2021), who base their analysis on Historical-Cultural Psychology, and Activity Theory to discuss the act of studying as a specific way of human activity constituted at school. The authors affirm that the act of studying does not amount to the execution of tasks, or to the mechanical assimilation of contents; rather, it involves the formation of theoretical thinking, oriented by the conscious appropriation of scientific knowledge. This activity is socially mediated, intentionally organized, and depends on the teacher's role in creating conditions that enable the student to comprehend the concepts in their entirety, surpassing empirical and immediate ways of thinking.

In this sense, the work of teachers is understood as a central element in the organization of the act of studying. Sforni *et al.* (2021) highlight that the teacher does not act only as a transmitter of information, but as an organizer of didactic conditions that enable developmental learning. This involves the selection of content, the proposition intellectually challenging tasks, and the mediation of processes of conceptual generalization. The organization of teaching, however, must provide the transition from everyday thinking to theoretical thinking, contributing to the development of students' higher psychological functions.

Returning to Goethel and Fonseca (2025), the authors affirm, in a very similar way, that consciousness is not formed by the simple exposure to content or by the adaptation to stimuli,

but by the participation of the subject in activities that are meaningful. Along these lines, when AI predominantly operates through statistical patterns and behavioral predictions, it tends to disregard the historicity, intentionality and the contradictions that are inherent to human activity, elements that are fundamental to the development of critical consciousness.

In order to complement these reflections, Santos and Asbahr (2024) also start from Historical-Cultural Theory to affirm that the act of studying is not an individual, spontaneous, or merely cognitive process, but rather an activity that is socially mediated, historically organized, and oriented by collective goals. School learning is understood as a specific form of human activity that is constituted through social relationships and carried out through the mediation of others, especially that of the teacher. Thus, the students' psychological development depends on their integration into collective practices that enable the conscious appropriation of scientific, artistic, and philosophical knowledge that has been historically produced.

The fact that these authors share the same theoretical foundations that allows us to reiterate these aspects of the teaching and learning process within the school environment, particularly by incorporating questions related to the use of AI in education. In this sense, Goethel and Fonseca (2025) criticize the notion of algorithmic personalization of learning. Although frequently presented as a pedagogical advance, this personalization may reinforce fragmented and individualized formative trajectories, weakening the social and collective character of education. For the authors, this process threatens the construction of shared meanings, which are essential to the omnilateral formation of the subject.

In a complementary way, Santos and Asbahr (2024) emphasize that studying is an activity that is organized, intentional, and oriented toward the formation of theoretical concepts, and not only toward the acquisition of practical skills or fragmented information. Collectivity appears as an essential condition for students to comprehend the social meaning of the content and to construct personal meanings to be linked to their human formation. The interaction with classmates and teachers enables problematization, analysis, mental synthesis, and reflection, overcoming immediate ways of thinking and promoting the development of higher psychological functions.

Goethel and Fonseca (2025) also warn against the naturalization of algorithmic authority in education. By attributing to AI systems the function of orienting learning choices, pace, and learning paths, there is a risk of obscuring the social and ideological

relations that structure these technologies. In this way, the technical mediation may conceal the social mediations, displacing the pedagogical responsibilities from human subjects to apparently neutral devices.

From Leontiev's perspective, the authors defend that education must promote the conscious appropriation of culture, rather than the passive adaptation to automated systems. When AI is used uncritically, it can contribute to the alienation of students from their own learning activity, inasmuch as personal meaning is progressively replaced by automated responses and guidance that is external to the student (Goethel and Fonseca, 2025).

In line with the authors' criticism, we acknowledge the possibility of AI acting as a mediating instrument, as long as it is subordinated to pedagogical projects aimed at the formation of critical consciousness. To this end, Goethel and Fonseca (2025) emphasize the importance of teachers understanding the theoretical foundations of human development and assuming their role in pedagogical mediation.

Santos and Asbahr (2024), in turn, highlight the irreplaceable role of teacher mediation in organizing the activity of studying. The teacher does not act as a mere transmitter of content, but as the organizer of didactic conditions that enable the appropriation of scientific knowledge. This mediation involves the selection of content, the proposition of intellectually challenging tasks, and the creation of collective learning situations that favor the formation of theoretical thinking (Saviani, 2013, Duarte, 2004). Therefore, the activity of studying is inseparable from a pedagogical project that is socially oriented.

Finally, Goethel and Fonseca (2025) conclude that the main challenge of integrating AI into education lies in preventing that the personal meaning of the educational activity from being delegated to the algorithm. The defense of a humanizing education, anchored in Historical-Cultural Psychology, implies reaffirming the centrality of human activity, conscious mediation, and the formation of subjects capable of giving meaning to their own educational and social practices.

Next, we turn to the contributions of Rodrigues *et al.* (2025), to complement the reflections already presented.

3 AI as a mediating instrument of human activity

Rodrigueiro *et al.* (2025) propose a critical reflection on Artificial Intelligence (AI), starting from the foundations of Historical-Cultural Psychology, aiming to understand its implications for teaching, learning, and human development. The authors proceed from the assumption that digital technologies, far from being neutral, as we previously mentioned, constitute cultural mediations historically situated that reconfigure social and educational practices.

According to the aforementioned authors, AI is understood as a complex cultural artifact, produced within specific social and economic relations, whose insertion in the educational field demands a rigorous theoretical analysis. From the Historical-Cultural perspective, the authors highlight that every technology acts as a mediating tool for human activity, influencing both the organization of human actions and the constitution of higher psychological processes (Rodrigueiro *et al.*, 2025).

Rodrigueiro *et al.*, (2025) engage in a consistent dialogue with the theoretical contributions of Vygotsky, Leontiev, and Luria, emphasizing that human development occurs through the appropriation of culturally elaborated tools and signs. In this sense, AI is analyzed not only as a technical tool, but as a symbolic mediation that can transform relationships among subjects, knowledge, and pedagogical activity (Rodrigueiro *et al.*, 2025).

The authors highlight that the uncritical use of AI in education may reinforce technicist and adaptive conceptions of learning, in which the focus is on efficiency, the prediction of behaviors, and the standardization of formative pathways. Such logic contrasts with the Historical-Cultural perspective, which understands learning as a social, dialectical, and intentional process oriented towards the humanization of the subject, as we have seen so far.

Another relevant aspect of the study refers to the criticism of the idea of replacing teacher mediation with artificial intelligence systems. Rodrigueiro *et al.*, (2025) argue that the pedagogical activity involves ethical, political, and affective dimensions that cannot be automated. Human mediation is considered as irreplaceable because it is through it that meanings, personal senses, and intersubjective relationships fundamental to the development of consciousness are constituted.

The study also problematizes the promise of personalized learning mediated by algorithms. Although it is presented as pedagogical innovation, this personalization may lead to the fragmentation of knowledge, and to the excessive individualization of

educational processes, weakening the collective character of learning. From the Historical-Cultural standpoint, such a movement compromises the construction of educational practices oriented toward omnilateral human formation (Rodrigueiro et al., 2025), as also discussed by Goethel and Fonseca (2025).

The authors also emphasize that AI systems operate on the basis of historical data and statistical patterns, which tend to reproduce social inequalities and structural biases. When incorporated to education without critical reflection, these technologies may reinforce exclusion processes and naturalize differences that are socially produced, icontradicting the emancipatory principles of education defended by Historical-Cultural Psychology.

In this way, the research conducted by the aforementioned authors advocates teacher formation as a fundamental element for ensuring that technology is integrated in ways that enhance pedagogical activity, without reducing teaching to automated procedures or predefined algorithmic responses (Rodrigueiro et al., 2025).

According to Marcolino and Cericato (2025), creativity, understood from the interface between Psychology and Education, constitutes an indispensable factor in teacher formation, especially in response to the challenges imposed by technological development and the contemporary demands of teaching. According to Vygotsky (2014), creativity is the human ability to produce something new by combining and transforming previously lived experiences, mediated by imagination and constituted through social and cultural relations. It is not an innate individual gift, but rather a psychological function that is historically developed from the interaction between the subject and culture. In this way, the authors reiterate that it involves cognitive processes, personality traits, motivational factors, and social conditions (cf. Marcolino and Cericato, 2025). Creativity manifests itself in the formation of teachers who are able to plan educational practices that go beyond the mere reproduction of algorithmic procedures. Thus, the organization of formative contexts and the way teachers' actions are evaluated become decisive, since the recognition – or inhibition – of creative initiatives directly impacts the professional development of teachers and their intellectual autonomy, which, in turn, is reflected in the quality of the pedagogical work.

Rodrigueiro *et al.*, (2025) also highlight that the analysis of AI must consider the totality of social relations in which it is inserted, including economic, political, and

ideological aspects. By emphasizing the unity between the subject and society, the Historical-Cultural Perspective offers theoretical tools to unveil the interests that orient the development and the dissemination of these technologies in the educational field.

In other words, these advances in the use of AI, if used uncritically, favor the weakening of the formation of subjects as individuals aware of their reality and of the development of capitalism. Lima and Lombardi (2026) argue that the school is a space of dispute between different worldviews and that, in a society divided into classes, education may not only contribute to the maintenance of alienation, but also to its overcoming.

From the perspective of Historical-Critical Pedagogy, alienation is connected to social conditions produced by capitalism (Lima and Lombardi, 2026). Since the consciousness of individuals is conditioned by the social relations of production, the ruling class seeks to disseminate a worldview that naturalizes inequality and exploitation. In this context, schools are frequently pressured to form individuals adapted to the existing order, reducing education to the development of instrumental competences geared toward the labor market.

The authors argue that educational reforms oriented by neoliberalism reinforce this alienation process by transforming education into a commodity, subordinating it to the logic of productivity, competition, and the formation of the labor force. Instead of promoting a critical comprehension of reality, schools begin to prioritize pragmatic and utilitarian abilities, distancing students from comprehending social and historical determinations of their own existence.

The Historical-Critical Pedagogy, in this sense, places itself in opposition to this trend (Lima and Lombardi, 2026). It holds that the social function of schools is to ensure that the children of the working class have access to scientific, philosophical, and artistic knowledge historically produced by humanity. This access is fundamental because it allows individuals to surpass the common sense and build a critical comprehension of social reality. This way, education becomes an instrument of emancipation, that is, of overcoming the forms of consciousness that conceal the contradictions of society.

When we look back at the reflections on AI, it is worth paying attention to the possible distractions that subjects may experience due to screens and social media, while countless public policies that increase the exploitation of the working class and strip away its access to healthcare, education, social security, and housing are being approved.

Rodrigueiro *et al.* (2025) highlight that Artificial Intelligence may contribute to educational processes only if it is subordinated to pedagogical proposals geared toward integral human formation. The authors reaffirm that the centrality of human activity, teacher mediation, and critical consciousness must be preserved, so that technology acts as a means, and not as an end in education.

4 The search for the formation of social subjects

By examining the studies by Goethel and Fonseca (2025) and Rodrigueiro *et al.* (2025), we identify common ground in terms of theoretical positions and concerns regarding the insertion of Artificial Intelligence (AI) in education, especially with regard to the processes of human consciousness formation. Both works are situated within the framework of Historical-Dialectical Materialism and Historical-Cultural Psychology, rejecting technicist and instrumentalist approaches that view AI as a neutral or a merely auxiliary tool in the educational process.

We have seen that the first point of convergence resides in understanding the technology as a cultural mediation historically situated. Both Goethel and Fonseca, and Rodrigueiro *et al.* (2025) reaffirm that the AI systems are produced within specific social and economic relations, expressing interests, values, and specific ways of organizing work and knowledge. This position is aligned with Historical-Dialectical Materialism, which understands the technical artifacts as products of human activity that is socially determined, and not as autonomous or neutral entities (Vieira Pinto, 2005).

In the field of Historical-Cultural Psychology, both studies dialogue with central categories such as mediation, activity, and consciousness. Goethel and Fonseca (2025) deepen the analysis from Leontiev's distinction between social meaning and personal sense, warning about the risk that delegating decisions to algorithms may cause the erosion of the personal meaning of learning. Rodrigueiro *et al.* (2025) reiterate the importance of teacher mediation and pedagogical activity as privileged spaces for the production of meanings, reinforcing the impossibility of replacing human mediation with automated systems.

At this point, both studies complement one another: while the first highlights the subjective and formative effects of algorithmic mediation on students' consciousness, the

second expands the analysis to encompass the organization of teaching and the pedagogical work. Together, they demonstrate that the issue of AI in education cannot be reduced to methodological or operational questions, but rather must be understood as an ontological and political question concerning human formation (Goethel e Fonseca, 2025; Rodrigueiro *et al.*, 2025).

From the perspective of Historical-Critical Pedagogy, both studies offer elements for criticizing the logic of the algorithmic personalization of learning. By fragmenting formative pathways and guiding teaching based on statistical patterns, AI tends to reinforce an adaptive concept of education, geared toward the adaptation of the individual to predefined systems. Such logic is distant from the Historical-Critical project of education, whose purpose is the conscious appropriation of historically produced knowledge and the formation of subjects capable of comprehending and transforming social reality (Saviani, 2013, Duarte, 2004).

However, it is also possible to establish analytical distinctions between the two studies. Goethel and Fonseca (2025) adopt a more forceful stance by problematizing the risk of subjective alienation arising from the delegation of personal meaning to the algorithm, thus offering a more radical criticism of algorithmic mediation. Rodrigueiro *et al.* (2025), in turn, maintain a more cautious stance, emphasizing the possibility of the critical appropriation of AI, provided that it is subordinated to conscious pedagogical projects and to teacher formation. This difference does not constitute a theoretical contradiction, but rather expresses different levels of emphasis within a common critical ground.

Both investigations converge, however, by reaffirming the centrality of human activity as a founding category of psychic development. Thus, when AI comes to organize, prescribe, or anticipate educational activity, there is a risk of removing the subject from their active position, compromising the formation of critical consciousness, which encompasses both the teaching praxis and students' learning processes (Goethel e Fonseca, 2025; Rodrigueiro *et al.*, 2025).

From perspective of Historical-Dialectical Materialism, both articles contribute to unveiling the ideological character of the uncritical incorporation of AI into education. The naturalization of the algorithmic authority conceals the power relations, the economic interests, and the forms of exploitation of intellectual labor that sustain these

technologies. In this aspect, the texts reiterate the necessity for analysing AI as part of social totality, relating education, labor, science, and technology, which is also present in Vieira Pinto's studies (2025).

Finally, we reinforce that the works of Goethel and Fonseca (2025) and Rodrigueiro *et al.* (2025) strengthen one another by offering a well-founded criticism of AI in education from the perspectives of Historical-Cultural Psychology and from Historical-Dialectical Materialism. Their contributions point to the urgency of an educational project that reaffirms teacher mediation, the centrality of human activity, and the formation of conscious subjects capable of assigning meaning to social practices, preventing education from being converted into an algorithmic adaptation process to the existing order.

We also incorporate contributions from Historical-Critical Pedagogy, which is likewise grounded in Historical-Dialectical Materialism, in order to complement our discussion by examining, more specifically, the presence of AI in education. In this way, we reiterate our concern regarding the unrestrained and uncritical use of AI and social media by children and young people, particularly students from mainstream schools as the growing number of violent situations reveals alarming evidence of changes in individuals' subjectivity resulting from the virtual universe of communication and socialization.

Furthermore, the declining interest in face-to-face interaction, the reduced attention span, and the superficiality of social relationships have also been giving rise to new configurations of social activity, reshaping the school environment and requiring education professionals to develop an urgent, and yet in-depth multilateral comprehension of these changes in school reality.

As Santos Júnior (2018) reminds us, insofar as the critical analysis of the social function of schools is not dissociated from the structural crisis of the capitalist mode of production, we can understand the context in which the project of the globalization of education is consolidated, marked by the privatizing logic of employability. This confrontation is expressed both at the level of conceptions of the world, human beings, schooling, and within educational institutions, which reconfigure curricula, political-pedagogical projects, and formative practices.

Critical analysis must be materialistic and historical when it is grounded in the Marxist tradition, starting from a concrete basis for comprehending the totality of social

relations that structure human formation. From this perspective, the school is understood as it presents itself in reality, and it is the task of criticism to identify, within the existing contradictions, the possibilities for overcoming them and for constructing a social function and a teaching role oriented toward human emancipation (Santos Júnior, 2018).

5 In conclusion

We have seen that the growing presence of digital technologies and AI, associated with the intensification of virtual culture, imposes new challenges to the school, demanding that educators develop a historical, material, and totalizing understanding of these transformations. From this perspective, the Marxist criticism does not limit itself to denouncing the limits imposed by privatizing and technicist logics; on the contrary, it seeks to identify, within the contradictions of reality itself, the possibilities for overcoming them, reaffirming the role of education and teachers in the formation of subjects capable of comprehending and transforming social reality.

The school and teaching work must assume, however, the task of mediating the use of these technologies in order to promote the development of consciousness, intellectual autonomy, and the critical appropriation of historically produced knowledge. In this way, technology may cease to be an instrument of adaptation and control and become a means of expanding human capabilities, provided that it is integrated into pedagogical practices whose ultimate aim is the emancipation of individuals and the transformation of existing social conditions.

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