

# Mathematics Teaching in the Neoliberal Context: contributions of Historical-Critical Pedagogy<sup>1</sup>

*Ensino de Matemática no contexto neoliberal: contribuições da Pedagogia Histórico-Crítica*

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## Abstract

The present text seeks to present the contributions of Historical-Critical Pedagogy to the teaching of Mathematics, which surpass the multiculturalist and pseudo-critical theoretical frameworks of the postmodern agenda, identified in the two main research trends within the field of Mathematics Education: Ethnomathematics and Critical Mathematics Education. This is a bibliographic study that considers the main references of both approaches. Therefore, we begin with an analysis of the ideas of Ubiratan D'Ambrosio and Ole Skovsmose, without losing sight of the assumptions that shaped the development of these two trends. We conclude that their considerations on the educational process reveal their adherence to capitalism as a historical project of society and, consequently, the ineffectiveness of their formulations in favor of social transformation. In

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contrast to these limitations, this study presents an overview of the theoretical foundations and principles of Historical-Critical Pedagogy, emphasizing its counter-hegemonic possibilities for the teaching of Mathematics. Based on the contributions of Giardinetto (1999; 2021; 2023) and grounded in Marxist and Marxian theory, it advocates for a mathematics education oriented toward the interests of the working class, committed to critical formation, the understanding of social contradictions, and the effective transformation of reality, reaffirming the social role of the school as the institution responsible for the socialization of humanity's accumulated knowledge.

**Keywords:** Historical-Critical Pedagogy. Critical Mathematics Education. Ethnomathematics. Postmodernism. Neoliberalism.

## Resumo

*O presente texto busca apresentar as contribuições da Pedagogia Histórico-crítica para o ensino de Matemática, que superem os referenciais teóricos multiculturalistas e pseudocríticos da agenda pós-moderna, identificados nas duas principais tendências das pesquisas do campo da Educação Matemática: a Etnomatemática e a Educação Matemática Crítica. Trata-se de uma pesquisa de cunho bibliográfico, que considera as principais referências da área nas duas correntes. Partimos, portanto, da análise das ideias de Ubiratan D'Ambrosio e Ole Skovsmose, sem perder de vista os pressupostos que configuraram o desenvolvimento dessas duas tendências. Concluímos que suas considerações sobre o processo educativo evidenciam sua adesão ao capitalismo como projeto histórico de sociedade e, conseqüentemente, a inocuidade das suas formulações em prol da transformação social. Em contraposição a essas limitações, o estudo apresenta um panorama das bases teóricas e dos princípios da Pedagogia Histórico-Crítica, destacando suas possibilidades contra-hegemônicas para o ensino de Matemática. Com base nas contribuições de Giardinetto (1999; 2021; 2023) e na fundamentação marxista e marxiana, defende-se uma educação matemática voltada aos interesses da classe trabalhadora, comprometida com a formação crítica, a compreensão das contradições sociais e a transformação efetiva da realidade, reafirmando a função social da escola como a de socialização do saber acumulado pelo gênero humano.*

**Palavras-chave:** Pedagogia Histórico-crítica. Educação Matemática Crítica. Etnomatemática. Pós-modernismo. Neoliberalismo.

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## Introdução

For the common belief, the omnipresence of mathematical knowledge in everyday situations, its applications in technology, and even its role in the development of logical and cognitive reasoning are more than enough to attest to the importance of this science. The dissemination of these ideas by mathematicians and international organizations, as well as their wide circulation in the media, permeates schools' curricula and constitutes an element that is strongly consolidated in common knowledge. Considering, as Marx and Engels argue in *The German Ideology*, that the dominant ideas of a period are the ideas of the ruling class, it is necessary to recognize and examine the role of mathematical knowledge in the educational process under the aegis of capital and its commitment to the interests of dominant fractions of the bourgeoisie.

From the mid-twentieth century onward, mathematics education was marked by an initiative of the mathematical community known as the New Math Movement, which reached Brazil under the name Modern Mathematics Movement. This initiative sought to bring school mathematics closer to the recent advances of academic mathematics, which were characterized by the fragmentation of instruction in the field's branches—namely arithmetic, algebra, and geometry—placing greater emphasis on understanding and discovery-based learning than on mechanization (Guimarães, 2011). In Brazil, this movement was strongly influenced by the constructivist perspective, which came to understand mathematics as the result of mental operations and, therefore, the student's mathematics as a conceptual system, in which “the teacher who seeks to determine as much as possible about their students' mathematical thinking may be called a constructivist teacher, and the type of activities used for this purpose, constructivist teaching” (D'Ambrosio & Steffe, 1994, p. 31, translated by authors).

Research in the field of Mathematics Education—a designation that reflects a stance committed to contextualizing mathematical knowledge in its historical, cultural, and social dimensions—has undertaken the task of developing a critical perspective on the uses of this science, questioning its role in mechanisms of social exclusion and opening pathways for new methodologies that recognize the potential of Mathematics for social transformation. With the incorporation of sociopolitical theories and concepts, the field of Mathematics Education underwent what Gutiérrez (2013) terms the *sociopolitical turn in mathematics education*, arguing that, from the 1980s onward, scholars in the field began to engage with social and political theories, identifying relations of power and identity within the processes of teaching and learning Mathematics. The author further adds that researchers who adopted such perspectives “seek not only a better understanding of Mathematics Education in all its social forms, but to transform Mathematics Education in ways that privilege more socially just practices” (Gutiérrez, 2013, p. 40, translated by the authors).

Within this broader movement toward a multidimensional and critical contextualization of mathematical knowledge, Ethnomathematics and Critical Mathematics Education (CME) have distinguished themselves as trends within the field that position themselves as alternatives to 'traditional and mechanized' teaching. Among the principal ideas of these currents, a multiculturalist orientation constitutes a common denominator, seeking to ensure curricular space for students to engage with other forms of mathematics and their relationships to everyday phenomena and processes—that is, Mathematics as it manifests within “real” contexts. Advancing this line of thought, the proposal of CME seeks to introduce debate concerning the uses of mathematical knowledge as a tool of power in such contexts. In doing so, the field has expressed concern with positioning itself as a critical community, conscious of the problems faced by humanity and attentive to the urgency of addressing pressing issues at both national and international levels. Accordingly, researchers associated with these reform-oriented tendencies assign to the field itself the task of formulating and actively participating in the construction of such solutions, advocating for a mathematics education capable of conveying these ideals, grounded in concepts such as social justice and equity.

However, the interpretation advanced in the present text is that such tendencies, even as they present themselves as heralds of a critical dimension, have incorporated the postmodern wave of relativism, which denies the universality of culture and science in favor of a plurality of “mathematics” that can no longer be ignored within the school curriculum. Behind the ideal of celebrating and reclaiming cultural diversity, the commitment of Mathematics

Education to the political and cultural dimensions of mathematics teaching appears to be established within the limits of the capitalist mode of production, insofar as the denial of the objectivity of scientific knowledge is of considerable utility in maintaining the hegemony of dominant bourgeois fractions. The transformative proposal of Mathematics Education seems to overlook the contradiction inherent in seeking new theoretical frameworks aimed at “more socially just practices” while failing to acknowledge the objective determinations of capital in education, given that the very logic of capital imposes the necessity of inequality. It may be argued that, beyond the valorization of Mathematics, conceptions such as the objection to the notion of mechanized teaching and the consequent emphasis on active methodologies, together with cultural relativism and the overvaluation of everyday knowledge—popularized within Mathematics Education—are rooted in the pedagogies of “learning to learn” (Duarte, 2011, translated by the authors), the pedagogical expression of neoliberal ideology and the theoretical basis for the educational guidelines formulated by international organizations.

Considering the advance of postmodern theses within the educational process, we recognize the urgency of incorporating a radically critical perspective across the various fields of school subject instruction—one that does not deviate from its ultimate objectives or its revolutionary commitment, given that, even under the interests of large-scale capital, schooling enables the working class to gain access to the objective knowledge accumulated and systematized by humanity. In this sense, any critique that aims to break with the logic of mathematics teaching within the neoliberal historical bloc must confront the very mechanisms that sustain this regime of production and accumulation. In the case of Mathematics Education, such critiques cannot be limited to studies and analyses exclusively concerned with teaching practices, the classroom, or specific mathematical content.

We further conjecture that the absence of categories derived from Marxian and Marxist thought in research within the field, as well as the limited use of historical-dialectical materialism, may be the result of the hegemony of the postmodern agenda, which, in rejecting the metanarratives of modernity, also dismisses Marxian and Marxist theory in its entirety. Within the postmodern framework, the dialectical relationship between structure and superstructure is lost, and “economy” and “politics” are frequently mobilized as categories belonging to distinct contexts. Thus, a central impasse emerges in the research conducted by mathematics educators: the attempt to promote a critical perspective on mathematics teaching aimed at social transformation while disregarding the very structural elements of the society that is to be transformed. By aligning itself with the postmodern framework, Mathematics Education fails to encompass the degree of radicality required to envision a new societal project. In this sense, in seeking to propose pathways for overcoming the limitations of these formulations, we advocate Historical-Critical Pedagogy (HCP) as a horizon for the construction of a perspective on mathematics teaching in the service of the working class.

The present work is structured into two sections, in addition to the introduction and conclusion. In the first section, we seek to present the two principal tendencies mentioned—Ethnomathematics and Critical Mathematics Education—outlining their central ideas based on the contributions of leading scholars in the field, as well as offering some critical reflections regarding their limitations. In the second section, we provide a general overview of Historical-Critical Pedagogy and discuss some of its contributions to the teaching of Mathematics.

## 2. The ‘Critical’ Currents in Mathematics Education

Considering these transformations and the new directions taken by Mathematics Education, the field’s concern with establishing itself as a critical community—aware of the problems faced by humanity and committed to seeking solutions to urgent issues in both national and international contexts—becomes evident. To overturn the paradigm of mathematics as an instrument for the maintenance of inequalities, research in the area has produced a discourse according to which Mathematics can—and should—fulfill a new role, this time in the service of social transformation. Throughout the development of research in Mathematics Education, the construction of this discourse

has undergone certain modifications, yet it has retained its “interdisciplinary” character, insofar as mathematics is understood as being “in everything” and therefore essential for all citizens. Accordingly, Mathematics Education assigns itself the task of promoting instruction grounded in “an ideal of peace for the happiness of humanity; of knowledge that contributes to the preservation of life, to the freedom of the subject, to the formation of a critical citizen, aware of his or her rights and duties, thereby enabling the transformation of reality” (Bampi, 1999, p. 124, translated by the authors).

Within the development of ideas in this field of research, several tendencies have gained prominence as they respond to the aspirations, needs, and determinations of the historical contexts in which they are formulated, offering interpretative frameworks aligned with the ideological positioning of researchers or purported forms of “resistance” to the neoliberal logic that permeates pedagogical thought. Recognizing the impossibility of presenting all the tendencies that compose the historical development of Mathematics Education, we focus on two of the principal currents that continue to influence research in the field: Ethnomathematics and Critical Mathematics Education.

## 2.1 Ethnomathematics

One of the most prominent tendencies in Mathematics Education, the so-called Ethnomathematics Program originated in the ideas of Ubiratan D’Ambrosio in the mid-1980s, inspired by the “recognition that different cultures have different ways of dealing with everyday situations and problems and of providing explanations for natural and social facts and phenomena” (D’Ambrosio, 2018, p. 189, translated by the authors). According to D’Ambrosio (2005, p. 114),

the discipline called mathematics is, in fact, an Ethnomathematics that originated and developed in Mediterranean Europe, having received some contributions from Indian and Islamic civilizations, and which reached its current form in the sixteenth and seventeenth centuries, from which point it was taken and imposed throughout the world. Today, this mathematics acquires a character of universality, especially due to the predominance of modern science and technology, which were developed from the seventeenth century onward in Europe (translated by the authors).

Under the influence of the sociopolitical turn, an approach was thus developed that sought to adopt a “broader” view of the mathematics known by students, highlighting the sociocultural aspects of mathematics education and emphasizing

the need for teachers and educators to develop and employ alternative pedagogical actions aimed at overcoming the sociocultural oppression of/in students that is implicit in the educational process, [seeking] to foster an understanding of mathematical concepts intended to reduce bureaucratic effects and minimize the social differences imposed by the dominant culture upon members of minority cultural groups (Rosa, 2021, pp. 22–23, translated by the authors).

From the perspective of Ethnomathematics, which marked the adoption of a socio-ethnocultural conception, both Mathematics Education and Mathematics itself come to be understood as human activities “socioculturally determined by the context in which they are carried out” (Fiorentini, 1995, p. 25). In this view, mathematical knowledge acquires validation and meaning only within a cultural group, thereby relativizing mathematics (Fiorentini, 1995). In line with D’Ambrosio’s ideas, a school curriculum aligned with the ethnomathematical tendency would include, in contrast to traditional instruction,

comprehensive content drawn from traditions as well as from recent advances in mathematics. Content in traditional Mathematics Education is a rigid arrangement of theories and techniques developed, often hundreds of years ago, accumulated in academic environments, in epistemological cages and ivory towers. Even so, within traditional teaching, it is possible to organize classes by seeking shortcuts and new arrangements and applications

of techniques and theories, especially with the extensive resources offered by new information and communication technologies. Teachers can contextualize content through problems formulated in terms of real life, everyday experience. Unfortunately, many create artificial, decontextualized problems as a mere repetitive mechanism to illustrate theories. What we may call “truly real” situations and problems are out there, outside the cages, not “invented” by the teacher. They must be recognized and addressed through ad hoc methods created by individuals—students or researchers. This was clearly demonstrated by Descartes in the Discourse on the Method. Ad hoc ways of dealing with facts and phenomena, situations and problems, may evolve into individual and shared, socialized methods (D’Ambrosio, 2018, p. 201, translated by the authors).

By employing the expression “truly real,” the author clarifies that he refers to “facts and phenomena perceived by individuals, according to their sensory and mental structures” (D’Ambrosio, 2018, p. 202, translated by the authors), adding that he understands reality as comprising “artifacts—everything material that exists, existed, or will exist—plus mentifacts, which are abstractions, the imaginary, illusions and disillusions, dreams and beliefs, even fiction, which belong to each individual’s mind” (D’Ambrosio, 2018, p. 202, translated by the authors). In this sense, contextualization in mathematics teaching serves not merely as a didactic tool but as an objective of the school institution itself, which, according to the author, “should be a space not only for instruction, but primarily for socialization and for criticizing what is observed and felt in everyday life” (D’Ambrosio, 2018, p. 201, translated by the authors).

On this basis, D’Ambrosio contends that:

The greatest objective of Education, in a broad sense, is to help people communicate. For this to occur, individuals must produce, from the mentifacts they create, artifacts that can be perceived by others. This is the step toward communication. Learning to gesture, to speak, to draw, to count, to write, and other productions—particularly artistic ones—enable individuals to materialize their mentifacts, their ideas, into artifacts, and only in this way can they be perceived and interpreted by others. In fact, these are initial evolutionary steps for every child, as well as evolutionary steps of the human species. Practices conducted in this way are typical of the Project Method, one of the most significant tendencies in Mathematics Education and the methodology most appropriate in response to the pedagogical strand of the Ethnomathematics Program (D’Ambrosio, 2018, p. 202, translated by the authors).

From the foregoing, it may be inferred that the Ethnomathematics Program aligns itself with postmodern multiculturalist premises and with the pedagogies of “learning to learn,” which relegate to a secondary position the school institution’s task of transmitting the systematized knowledge accumulated by humanity. Beyond what may amount to a diluted form of reflection, Giardinetto (1999) highlights the overvaluation of everyday knowledge in a movement that disregards the ultimate purpose of the educational process and of pedagogical work in mediating the objectifications produced by humankind. The same author identifies weaknesses in research predominantly associated with this tendency, pointing to four factors: the valorization of everyday life as the locus of true knowledge; the conception of reality at the level of its immediacy; the supposed immutability of the ideological character of the school institution, viewed merely as a mechanism for perpetuating a social structure of alienation; and the premise of “different” mathematics as a central curricular element (Giardinetto, 1999).

Thus, by invoking cultural roots as a condition for reflection and action toward social transformation, Ethnomathematics diverges from the Marxist perspective, which seeks to understand relations of alienation in the production of science without rejecting the humanizing aspects of such advances—namely, to “make evident the dynamic of the development of the human genus in the dialectic between humanization and alienation” (Giardinetto, 2023, p. 42, translated by authors). In other words, it overlooks the fact that “school mathematics, regardless of being ‘Western mathematics,’ is seen here as a legacy of the historical process of the constitution of the human genus” (Giardinetto, 2023, p. 60, translated by the authors).

In his study of the limits of ethnomathematical critique, Pais (2012, p. 34) argues that the program constitutes what Paulo Freire (1998, p. 508) termed a “superficial transformation,” which, “far from combating the status quo, contributes to its fortification.” What appears largely absent from Ethnomathematics research, in general, is a reflection

on the social function of the school and its possibilities under the regime of capital. Grounded in cultural relativism, the ideas of Ethnomathematics ultimately resonate with the ideals of the dominant class. In this sense, beyond the theoretical ineffectiveness of its critique, its incompatibility with and lack of commitment to the socialization of systematized knowledge preclude any emancipatory perspective through mathematics teaching. Precisely because of this essential incompatibility, Ethnomathematics is reduced to proposing new methodologies and valorizing non-hegemonic “mathematics,” while preserving the central elements of mathematics education that serve the interests of the dominant class.

## 2.2 Critical Mathematics Education

Grounded in the Critical Theory of the Frankfurt School and in the ideas of Paulo Freire, Ole Skovsmose maintains that any project aimed at constructing a critical mathematics education must seek to promote democratic competence. Starting from the premise that Mathematics and the Natural Sciences are guided by a technical interest, whereas the Social Sciences are oriented toward emancipation, Skovsmose seeks to overcome an apparent contradiction: “If mathematics serves technical interests, how could Mathematics Education serve emancipation?” (Ceolim & Hermann, 2012, p. 11, translated by the authors). Influenced by Paulo Freire and by Adorno’s Education after Auschwitz, Skovsmose (2023, p. 167) concludes that, for education to play a political role in social transformation, it is necessary to rethink the role of Mathematics and Mathematics Education within social structures. Thus, he argues that:

For education, both as practice and as research, to be critical, it must discuss the basic conditions for the production of knowledge, be aware of social problems, inequalities, suppression, etc., and seek to make education a progressively active social force. A critical education cannot be a mere extension of existing social relations. It cannot function as an accessory to prevailing inequalities. To be critical, education must react to social contradictions (Skovsmose, 2001, p. 101).

Critical Mathematics Education (CME) recognizes that “mathematics is placed in the role of an idol” (Ceolim & Hermann, 2012, p. 12) and that many decisions are justified on the basis of “mathematical argumentation,” thereby conferring significant social power upon mathematics and subjecting those without access to it to the control of power holders (Filho et al., 2017, p. 70, translated by the authors). While Skovsmose (2005, p. 112) acknowledges the importance of such concerns and conceives CME as a discourse characterized by its intention to “establish situations that facilitate processes of dialogue,” he also claims that “there exists no justification for any discourse,” including CME, thereby introducing a level of uncertainty typical of critical theories of learning (Skovsmose, 2005, p. 113).

For Skovsmose (2001, p. 18, translated by the authors), “education must be part of a process of democratization.” Accordingly, dialogue and the student–teacher relationship are crucial: “If we wish to develop a democratic attitude through education, education as a social relation must not contain fundamentally non-democratic aspects. It is unacceptable that the teacher (alone) should have a decisive and prescriptive role” (Skovsmose, 2001, p. 18, translated by the authors). He argues that

In CE [Critical Education], critical competence is attributed to students (and to teachers). This competence is attributed primarily to students for two reasons. First, for factual reasons: although students’ experiences may be flawed, fragmentary, and so forth, they nonetheless possess a general body of experience which, in dialogue with the teacher, enables them to identify issues relevant to the educational process—relevant both to their immediate interests and to the broader perspective of the educational process. Second, for principled reasons: if education intends to develop critical competence, such competence cannot be imposed upon students; rather, it must be developed on the basis of capacities already in existence (Skovsmose, 2001, p. 18, translated by the authors).

It can thus be observed that both in Skovsmose’s work and in research related to Ethnomathematics there is an emphasis on situating the locus of the educational process within concrete reality. Such studies underscore the

valorization of contextualized forms of mathematical knowledge, spontaneous mathematics, and everyday forms of knowing. According to Skovsmose (2017, p. 34, translated by the authors), for Critical Mathematics Education (CME), “it is important to address critically any form of reading and writing with mathematics. This does not concern only academic mathematics and engineering mathematics. It concerns all forms of mathematics. It concerns any version of ethnomathematics.”

Skovsmose (2005, p. 122, translated by authors) further maintains that critical thinking requires questioning “how could mathematics, this apparently sublime form of reason and rationality, be associated not only with marvels but also with ‘horrors’?”, thereby challenging the notion of progress and its relationship to the Age of Enlightenment.

According to the Enlightenment, the straitjacket constraining the development of knowledge has been dogma. In its place, free knowledge production must be introduced as the driving force of progress. Such knowledge would ensure that humanity does not regress into a new medieval period encapsulated in dogmatism. The light of reason would serve as a safeguard against indoctrination. The problem lies not in knowledge itself, but in how it is obtained and how this universal good is distributed. Knowledge represents a form of epistemic well-being. Accordingly, it is not deemed necessary to exercise any form of “control of knowledge.” On the contrary, the objective should be to eliminate all institutions that attempt to control knowledge. Knowledge must be free. This principle applies equally to scientific knowledge. Since scientific knowledge is regarded as a “good” and “attractive” resource, it is considered unnecessary to question whether scientific progress should advance. Yet this assumption itself may be challenged (Skovsmose, 2005, p. 120, translated by the authors).

In favor of valuing language games, Skovsmose and the ideas advanced by Critical Mathematics Education (CME), grounded in the postmodern premise of the “decomposition” of metanarratives and “unified conceptions,” censure Marxist contributions to pedagogical thought and affirm the absence of ontological foundations capable of sustaining the emancipatory ideals of Critical Mathematics Education. According to the author, “there are no modernist metanarratives to provide critical education with any uncontested foundation [...]. Critical mathematics education has to operate in an open landscape of diverse, even contradictory, interpretations of its defining notions” (Skovsmose, 2017, p. 34, translated by the authors). He goes further, asserting that this theoretical “dismantling”

also applies to concepts such as autonomy, freedom, and social justice. One should not expect the existence of well-defined meanings for such notions. Rather, one must be prepared to assume that these notions may likewise lack a solid core; that they may operate within different language games; and that they may express a variety of meanings (Skovsmose, 2017, p. 20, translated by the authors).

Particularly in recent decades, the adoption of post-structuralist/postmodern frameworks in the research of mathematics educators has, evidently, also encompassed studies in Critical Mathematics Education. Pais (2013, p. 17) thus argues that “sociopolitical studies leaves us without theoretical tools to address the global economic system of capitalism and the role of school mathematics within it”. In this sense, there appears to be an alignment—albeit perhaps inadvertent—with the project of maintaining a dominant and alienating ideology that seeks to obscure social conflicts and, ultimately, to deny the manifest reality of class struggle. The question that arises, therefore, in distinguishing reflections on the social function of the school within Marxist thought from those advanced by the aforementioned tendencies in Mathematics Education (Ethnomathematics and Critical Mathematics Education), concerns how research in Mathematics Education fails to produce any substantive critique of the capitalist system in its totality. This stands in contrast to Historical-Critical Pedagogy (HCP), which seeks to situate education within a class-divided society on the basis of the theoretical and methodological framework of Marxism. Consequently, although several tendencies in Mathematics Education advocate a critical stance regarding the uses of Mathematics—by recognizing relations of power and identity in educational policies—their disregard for the place of schooling within the structure of the capitalist mode of production, which generates the necessity of school failure (Pais, 2013), ultimately characterizes the field itself as a compilation of methodologies aimed at understanding and overcoming low academic performance in the subject.

### 3. Historical-Critical Pedagogy and possibilities for mathematics teaching

Within the context of Marxist theory, the formation of a free and universal individuality entails the appropriation of the objectifications of the human genus, which denote the ongoing process of transforming natural reality and developing humankind. In the course of human history, the necessity of such appropriation for the creation of new objectifications has revealed the dynamic of the process of objectification and appropriation, which “comes to constitute the generative dynamic of the historical process” (Giardinetto, 2021, p. 11). Precisely because of the centrality of this dynamic in the production of human existence, the school emerges as an institution dedicated to the formation of individuals.

In order to understand the central elements of Historical-Critical Pedagogy (HCP), it is necessary to establish its position regarding the determinants of social relations and of the educational process itself: insofar as class struggle and school education present themselves as “objective modalities of social practice under the conditions of the prevailing society characterized by division into antagonistic classes” (Saviani, 2013, p. 26, translated by the authors), HCP understands educational practice as a mediating activity within social practice. In this sense, what Saviani seeks to convey with the expression

Historical-critical pedagogy is the endeavor to understand the educational question on the basis of objective historical development. Therefore, the conception presupposed in this view of historical-critical pedagogy is historical materialism, that is, the understanding of history from material development, from the determination of the material conditions of human existence (Saviani, 2011, p. 76, translated by the authors).

Any counter-hegemonic perspective of action within the field of education must begin with a precise understanding of the manner in which the society where educational practice unfolds is structured. When we speak of apprehending concrete reality in its totality, we seek to reaffirm, in accordance with Marxist thought, that objectivity is

a characteristic of reality. It is part of objectivity that objective beings exist as part of a set of relations. They do not exist in isolation. Objectivity is, above all, a characteristic of nature, which, in order to exist, does not need to be the object of any consciousness. In the case of nature, objectivity means that the object can exist without being in relation to any subject. With the emergence of human beings, of labor activity, and therefore of the sphere of social being, the objectivity of historical-social phenomena arises, which is, in part, different from the objectivity of purely natural phenomena, due to the fact that human activity is conscious activity, teleological activity—that is, guided by conscious ends. Nevertheless, social phenomena can also exist without human beings fully knowing them, that is, knowing them in their essence (Malanchen, 2015, pp. 61–62, translated by the authors).

This is the case with the relations that determine the educational process. Owing to the antagonistic character of class relations in capitalist society, education is likewise permeated by this logic; that is, it may take different forms depending on the interests of the class it serves. For this very reason, education is a political act. The denial of the role of education in the class struggle—or even the denial of the very existence of class struggle—is also a political act, one that favors the ruling class. On this premise, Saviani (2021) presents Historical-Critical Pedagogy (HCP) as a surpassing of both non-critical and critical-reproductionist theories of education. According to the author, for the former group, education is an instrument of homogenization, possessing autonomy in relation to social phenomena; for the latter, the educational process is subordinated to the structural determinants of society.

In this direction, Saviani (2011) maintains that, as a revolutionary theory of the educational process, HCP must set itself the following objectives:

a) The identification of the most developed forms in which historically produced objective knowledge is expressed, recognizing the conditions of its production and understanding its principal manifestations, as well as the current tendencies of its transformation.

b) The conversion of objective knowledge into school knowledge, so that it becomes assimilable by students within the time and space of schooling.

c) The provision of the necessary means for students not only to assimilate objective knowledge as a product, but to grasp the process of its production, as well as the tendencies of its transformation (Saviani, 2011, pp. 8–9, translated by the authors).

Based on the objectives highlighted above, it may be concluded that the project of schooling proposed by Historical-Critical Pedagogy (HCP) does not lose sight of the psychological and biological conditions of human development, while at the same time not limiting itself to them. The totality underlying the historical-critical conception does not suppress pedagogical thought; rather, it integrates it within a perspective of dialectical overcoming of any idealism that detaches the educational process from the historical and social determinations that shape it. It is essential to observe that “the definition of school contents is also a position-taking in this clash between worldviews that are not merely different, but fundamentally conflicting with one another” (Duarte, 2016, p. 95, translated by the authors), and this position, in turn, determines the conception of the social function of the school. Taking as the ultimate objective of schooling the appropriation of the classical knowledge produced by the human genus, it becomes evident that

teaching school subjects such as science, history, geography, the arts, physical education, Portuguese language, and mathematics is to teach the worldviews conveyed by this knowledge; that is, it is to educate. However implicit the worldviews present in the knowledge taught at school may be, they always exist, which makes the teaching of such knowledge invariably an educational act and invalidates the claim that teaching is not educating (Duarte, 2016, p. 95, translated by the authors).

In assuming the social function of the school as that of transmitting the systematized knowledge produced by the human genus, we do not, of course, disregard the importance of considering different effective teaching strategies and methods. On the contrary, the aim is to establish means that enable individuals to gain access to knowledge in its most developed forms. According to Saviani (2021, p. 56, translated by the authors),

these will be methods that stimulate students’ activity and initiative without, however, relinquishing the teacher’s initiative; that foster dialogue among students and between students and the teacher, while also valuing dialogue with the historically accumulated culture; that take into account students’ interests, learning rhythms, and psychological development, without losing sight of the logical systematization of knowledge, its organization and gradation for the purposes of the process of transmission and assimilation of cognitive contents.

The perspective of transformative teaching proposed by the aforementioned trends in Mathematics Education overlooks the fact that the learning process is the result of intentional and directed pedagogical work, aimed at creating the conditions for the assimilation of systematized knowledge. Ultimately, this implies affirming that school knowledge is not produced by students, as suggested by certain currents within Mathematics Education, but rather that it is the product of the teacher’s work of converting, selecting, and organizing objective knowledge in its most developed forms, with a view to understanding natural and social reality beyond immediacy. This reflection also entails a necessary distinction between school knowledge and scientific knowledge: it is part of the teacher’s work to organize and convert the former into the latter, contrary to the conception advanced by Ubiratan D’Ambrosio (2018, p. 191), who identifies the terms “academic mathematics” and school mathematics.

This intentional work aimed at the transmission and assimilation of knowledge also includes a crucial distinction between the activities that take place within the school. Malanchen (2016) reaffirms the importance of distinguishing between core and complementary activities, understanding this distinction as essential for establishing what truly constitutes knowledge of interest to individuals as school knowledge and what represents cultural or playful manifestations of a given historical context. Within the specific field of Mathematics Education, which is avowedly postmodern, researchers often

assume everyday life and objective reality as the ultimate reference for school content, treating as core certain complementary activities that do not, in fact, provide access to the most developed forms of knowledge.

It is important to highlight, in this context, the multiculturalism present in Mathematics Education research, which presupposes the impossibility of the political neutrality of knowledge but incorrectly concludes from this the absence of objectivity. However, since this critical contribution is artificially introduced into the educational process, it would not be capable of producing the effects desired by the community of these researchers. Representing this “critical” stance,

in terms of pedagogical proposal, D’Ambrosio (2001) considers it essential that Ethnomathematics foster a critical view of reality, making Mathematics “something alive, dealing with real situations in time (now) and space (here). And, through critique, to question the here and now. In doing so, we immerse ourselves in cultural roots and practice cultural dynamics” (D’Ambrosio, 2001, p. 46), thereby situating subjects within their own time and enabling them to reflect and act toward the transformation of society. In light of these various perspectives, conceptions, and understandings, we perceive that the potential of Ethnomathematics may lie in critically reflecting upon and seeking to break with the distorted view of a single universal, ahistorical, and Eurocentric Mathematics, restoring to this field of knowledge its philosophical, historical, cultural, and human dimension, which, according to D’Ambrosio himself, makes it an Ethnomathematics (Soares; Fantinato, 2023, p. 86, translated by the authors).

In this case, the perspective of grafting a supposed critical thinking onto the teaching of Mathematics ultimately neglects core activities—those pertaining to the transmission of school contents—in order to concentrate efforts on complementary actions, a tendency aggravated by the popularity of project-based pedagogy, aligned with the postmodern slogan of “learning to learn.” It thus becomes evident that the intentional distinction between core and complementary activities is directly related to the commitment to socialize school knowledge.

In his work *Dialectic of Knowledge*, Prado Jr. demystifies the idealist view that understands mathematical knowledge as a complete abstraction and presents evidence of its development from empirical foundations, even in the most recent and complex areas of its evolution. A careful historical analysis reveals, in the advancement of Mathematics, the recurrence of two distinct movements: that of the production of knowledge, grounded in objective empiricism; and that of the formalization of this production, which relies upon intuition. From these two distinct movements, Prado Jr. (1963) identifies in Mathematics the same subtleties found in other areas of knowledge, recognizing in the construction of this science the precedence of empirical observation—related to the production of knowledge—over theoretical abstraction—related to the moment of formalization—which nevertheless does not lose its relation to experience, this time through intuition.

This finding restores the objective character of mathematical knowledge. Although its natural process of increasing complexity—especially in the context of science advancing under the aegis of capital—may obscure its connections with objective reality, these relations are never entirely severed. Thus, the product of this critique allows for a new approach to its teaching, for it is precisely on the basis of this ineliminable principle of correspondence with reality that Giardinetto (2021) sees possibilities for overcoming the pedagogical challenge posed to Historical-Critical Pedagogy (HCP): that of creating the conditions for students to appropriate the logic of relations inherent in mathematical knowledge.

The contributions of sensible experience manifested in everyday life, mobilized within the hegemonic ideas of Mathematics Education, represent—like the healthy core of common sense—a starting point for pedagogical work in school subjects. However, the level of abstraction achieved by the aforementioned dynamic of appropriation and objectification has rendered the assimilation of school knowledge through everyday sensible experience alone impossible. In seeking to contextualize this knowledge within empiricism, the postmodern thought of Mathematics Education revives the pragmatism of the progressive education movement, which understands schooling as a means of adapting individuals to society. With regard to the particularity of Mathematics teaching, this subjectivity becomes more complex precisely in the intuition referred to by Prado Jr. (1963). For Giardinetto (2021), Mathematics teaching

from the perspective of HCP must overcome “the logical-formal conception of this science and of its teaching, seeking in dialectical logic the means to carry out a dynamic Mathematics teaching that highlights the relations among its concepts” (Giardinetto, 2021, p. 33, translated by the authors). Accordingly, Giardinetto (2021, p. 33) establishes the use of the categories of the logical and the historical, the abstract and the concrete, and the singular, particular, and universal as keys to conceiving a Mathematics teaching that moves beyond the logical-formal conception and makes evident the relations between mathematical definitions and their effective determinations.

The dialectical categories of the logical and the historical relate directly to the teaching of school knowledge. As explained by Giardinetto (2021, pp. 33–35), systematized objective knowledge corresponds to the “logic of the product,” whereas the category of the historical represents the “logic of the process.” Taken in isolation, these categories are incapable of creating the conditions necessary for the appropriation of school contents; however, their complementarity ensures the understanding of the essential aspects of the objects of such knowledge. In this regard, Giardinetto (2021) emphasizes that, beyond recovering historical elements of the development of mathematical objects, it is necessary to recover the very logic of this development. In other words, it is not necessary to reproduce in full the development of the objects, but only the essential aspects that determine the evolution of concepts; history, as well as mastery of the final product, are each necessary but not sufficient conditions for the appropriation of knowledge. The mobilization of the historical notion here is not to be confused with dispersed elements of the historical context of knowledge production; that is, “the historical investigation necessary for the elaboration of teaching sequences does not coincide with the history of concepts” (Giardinetto, 2021, p. 66, translated by the authors).

The categories of the concrete and the abstract, in turn, relate to the movement of overcoming the immediacy of the concrete through the mediation of abstractions. According to Giardinetto (2021, p. 69, translated by the authors), “these function as mediators in the process of constructing the ‘concrete’ in thought. They fulfill the role of unveiling the ‘concrete’ through the characterization of each constitutive part of its whole and of its internal relations, its multiple determinations.” In the context of Mathematics teaching, the dialectical pair concrete/abstract opens the possibility of understanding the concreteness of abstractions; that is, “the comprehension of objective reality as a synthesis of multiple determinations through the understanding of each determination mediated by the appropriation of the most developed forms of knowledge required” (Giardinetto, 2021, p. 70, translated by the authors).

Finally, the categories of the singular, particular, and universal, according to Giardinetto (2021), relate to the process of humanization of individuals through the appropriation of the objectifications produced by the human genus. Giardinetto understands that the relation between individual and society—which corresponds to the categories of the singular and the particular—is subsumed under a more general relation, that of the human being with the human genus—corresponding to the relation between the singular and the universal. In the specific context of Mathematics teaching, Giardinetto (2021, p. 75, translated by the authors) states that “the mathematical knowledge mastered by an individual, the mathematics that emerges from the singularity of individuals in their engagement in social practice, is the particularity in which universality presents itself under the specific social circumstances of life, including social inequalities.” He further adds that “the recognition of a similarity within the diversity of knowledge production in social practice points to a reflection on the relation between the production of mathematics in specific local contexts and universal knowledge, through the historicity of the constituted human genus” (Giardinetto, 2021, p. 77, translated by the authors).

Such an understanding returns to the debates previously presented regarding the multicultural paradigm that gained prominence in Mathematics Education through Ethnomathematics, and once again highlights the need to establish the social function of the school and the role of the most complex forms of systematized knowledge produced by humankind in the process of humanization. In this sense, HCP, even within the context of Mathematics teaching, cannot be confused with a merely “content-centered” stance, insofar as it prioritizes the notion of classical knowledge already presented and seeks to make evident, in the Mathematics classroom, the dialectic of the categories discussed above.

Saviani (2011), as well as Duarte (2016), enable an understanding of the contradictions that traverse the educational process and of the necessity of schooling for the very development of capital. The same determinations

that create the demand for the increasing complexity of labor-power formation transform scientific knowledge into a means of production and render schooling a contradictory space: functional to the reproduction of capital, while simultaneously presenting itself as a possibility for the working class to appropriate the means of production. By enabling the process of humanization of individuals through the appropriation of the objectifications of the human genus, schooling in light of Marxist thought overcomes postmodern libertarian pessimism and positions itself before the system of capital as the representative of another possible metanarrative.

#### 4. Final remarks

In the conceptual and theoretical patchwork that constitutes postmodern thought as developed within Mathematics Education, the centrality attributed to mathematical science in this project of social emancipation reveals the weakness of a critical stance incapable of analyzing the core determinations acting upon the very issues it seeks to resolve: the system of capital. By rejecting Marxist theory, key categories necessary for understanding the functioning of society are also lost. Insofar as it is impossible to transform society without first comprehending the causal relations underlying the afflictions faced by most of the world's population, postmodern thought—even when presenting itself as critical, and even explicitly critical of neoliberalism—fails to indicate paths toward the genuine overcoming of the challenges confronting humanity. At the heart of this rejection lies the notion that class struggle has been superseded: the supposed postmodern, post-industrial, and post-capitalist society proclaimed the death of the grand socialist narrative and erroneously identifies in the regime of flexible accumulation, which accompanies new structural and superstructural determinations, a new economic model.

By establishing language, rather than labor, as the founding element of social being, the postmodern condition introduces notions of ambiguity and suspicion which, paradoxically, assume that the overcoming of inequalities and the realization of social justice are compatible with the capitalist mode of production. In the words of Ellen Wood (2006, p. 224), “Perhaps this is not a time for optimism, but a critical confrontation with capitalism is, at the very least, a good beginning.” Thus, the defense of plurality invoked through the rejection of metanarratives opened the way for the popularization of multiculturalism and relativistic propositions. From the perspective advanced by postmodern Mathematics Education scholars, multiculturalism stands out as the key to a supposedly democratizing conception of mathematical knowledge. In this context, relativism gains strength through the sophism that the impossibility of the political neutrality of knowledge likewise implies the impossibility of its objectivity.

We therefore understand Ethnomathematics as a development of this line of thought within the field of Mathematics Education, insofar as it proposes the valorization of socially and culturally situated forms of knowledge. By identifying school mathematics as knowledge originating from colonizing countries that impose their knowledge as superior, ethnomathematical thought presents everyday life as the locus of mathematical learning, recognizing “forgotten” mathematics of marginalized peoples and cultures. By further incorporating notions of project-based pedagogy, student protagonism, and the importance of learning to learn, we conclude that Mathematics Education ultimately succumbs to the imperatives of the pedagogies of capital, which, under a progressive veneer, promote an emptying of the educational process, maintaining individuals in a condition of alienation—even when the discourse is one of Critical Mathematics Education.

Regarding Critical Mathematics Education (CME), we observe that, beyond reiterating ethnomathematical ideals, Skovsmose's thought does not break with a perspective that overvalues Mathematics as an instrument of social transformation. On the contrary, we understand that the proposal to “read and write the world through Mathematics” reinforces the notion of a central role for this knowledge in achieving social justice and overcoming inequalities. That is, although various alienating elements of common-sense conceptions of Mathematics are recognized—such as its metaphysical and neutral character, detached from concrete reality and ideological dilemmas—CME is unable to

position itself as a genuine overcoming of these obstacles precisely because it conforms to the same neoliberal framework that produces and reproduces them.

By shifting the debate from class struggle to the terrain of diversity and identity-based agendas, the postmodern agenda loses sight of the structural character of the issues raised by minority struggles. From this same standpoint, we understand that the sociopolitical turn in Mathematics Education, rather than making evident the political determinations manifested in educational practice, limited itself to identifying the manifestations of these structural conditions in students' performance in Mathematics. In this sense, the research field becomes yet another instrument for adapting subjects to the ideological imperatives of the neoliberal offensive, concealed beneath a progressive discourse.

It is within this scenario that we establish Historical-Critical Pedagogy (HCP) as a possible horizon for a Mathematics teaching committed to the working class, even while recognizing, as Malanchen (2016, p. 158, translated by the authors) observes, that "if every pedagogy must contend with problems arising from attempts at its adoption in educational practice, in the case of historical-critical pedagogy such problems are of far greater complexity, since we are speaking of the adoption of a socialist pedagogy within a capitalist society."

Mathematics teaching, in this sense, must cease to be conceived as a technical competence or a tool for individual advancement and instead be understood as part of a collective project of human formation, as knowledge produced and systematized by the human genus. In light of the postmodern alignment with the logic of capital—and its consolidation as an integral theoretical tool within Mathematics Education thought—we affirm the urgency of a counter-hegemonic pedagogy to confront the neoliberal offensive in education: Historical-Critical Pedagogy. As presented in this work, albeit briefly, the implications of historical-dialectical materialism for pedagogy open new possibilities for conceiving Mathematics teaching in the service of the working class.

## References

- BAMPI, L. Efeitos de poder e verdade do discurso da Educação Matemática. *Educação e Realidade*, Porto Alegre, v. 24, n. 1, p. 115-143, 1999.
- CEOLIM, A. J.; HERMANN, W. Ole Skovsmose e sua Educação Matemática Crítica. *Revista Paranaense de Educação Matemática*, Campo Mourão, v. 1, n. 1, p. 8–20, 2012.
- D'AMBRÓSIO, U. A visão engaiolada do mundo. Entrevista concedida para o IHU OnLine. *Revista IHU ON-LINE*, São Leopoldo, n. 153, 2005.
- D'AMBROSIO, U. Etnomatemática, justiça social e sustentabilidade. *Estudos Avançados*, v. 32, n. 94, pp. 189- 204, 2018.
- D'AMBROSIO, B.; STEFFE, L. O ensino construtivista. *Em Aberto*, Brasília, v. 14, n. 62, pp. 23- 32, 1994.
- DUARTE, N. *Vygotsky e o "aprender a aprender": Crítica às apropriações neoliberais e pós-modernas da teoria vigotskiana*. 5. ed. Campinas, SP: Autores Associados, 2011.
- DUARTE, N. *Os conteúdos escolares e a ressurreição dos mortos: contribuição à teoria histórico-crítica do currículo*. Campinas, SP: Autores Associados, 2016.
- FILHO, D. B. *et al.* Cenários para investigação, imaginação e ação. *Revista Paranaense de Educação Matemática*, Campo Mourão, v. 6, n. 12, p. 64- 80, 2017.
- FIORENTINI, D. Alguns modos de ver e conceber o ensino da matemática no Brasil. *Zetetikè*, Campinas, v. 3, n. 1, p. 1- 38, 1995.
- FREIRE, P. Cultural action for freedom. *Harvard Educational Review*, v. 8, n. 4, P. 471–521, 1998.
- GIARDINETTO, J. R. *Matemática escolar e matemática da vida cotidiana*. Campinas, SP: Autores associados, 1999.

- GIARDINETTO, J. R. *Pedagogia histórico crítica e educação matemática: fundamentos teóricos e incursões pedagógicas*. Jundiaí, SP: Paco Editorial, 2021.
- GIARDINETTO, J. R. *Escola, Matemática e Cultura: Reflexões à luz da Pedagogia Histórico-crítica*. Jundiaí, SP: Paco Editorial, 2021.
- GUIMARÃES, H. A “modernização” do ensino da Matemática em Portugal – Sebastião e Silva e as perspectivas metodológicas emanadas de Royaumont (1959). In: Anais da Conferência Interamericana De Educação Matemática. *Anais [...]*, [S.l.]: Comitê Interamericano de Educação Matemática, 2011.
- GUTIERREZ, R. The Sociopolitical Turn in Mathematics Education. *Journal for Research in Mathematics Education*, v. 44, n. 1, p. 37-68, 2013.
- MALANCHEN, J. Pedagogia histórico-crítica e saber objetivo versus multiculturalismo e o relativismo no debate curricular atual. *Germinal: Marxismo e Educação em Debate*, v. 7, n. 1, p. 58-67, 2015.
- MALANCHEN, J. *Cultura, conhecimento e currículo: contribuições da pedagogia histórico-crítica*. Campinas, SP: Autores associados, 2016.
- PAIS, A. A investigação em etnomatemática e os limites da cultura. *Revista Reflexão e Ação*, Santa Cruz do Sul, v. 20, n. 2, p.32-48, 2012.
- PAIS, A. An ideology critique of the use-value of mathematics. *Educ Stud Math*, v. 84, p. 15–34, 2013.
- PRADO JR., C. *Dialética do conhecimento: tomo I: preliminares: pré-história da dialética*. 4. ed. Tatuapé, SP: Brasiliense, 1963.
- ROSA, M. Etnomatemática e o papel de Ubiratan D’Ambrosio: contribuições para a educação matemática, *APeDuC*, v. 2, n. 02, p. 13-26, 2021.
- SAVIANI, D. *Pedagogia histórico-crítica: primeiras aproximações*. 11. ed. Campinas, SP: Autores Associados, 2011.
- SAVIANI, D. A pedagogia histórico-crítica, as lutas de classe e a educação escolar. *Germinal: Marxismo e Educação em Debate*, v. 5, n. 2, p. 25-46, 2013.
- SAVIANI, D. *Escola e democracia*. 44. ed. Campinas, SP: Autores Associados, 2021.
- SKOVSMOSE, O. *Educação Matemática Crítica: A questão da democracia*. Campinas, SP: Papyrus, 2001.
- SKOVSMOSE, O. Guetorização e globalização: um desafio para a Educação Matemática. *Zetetike*, v. 13, n. 24, 2005.
- SKOVSMOSE, O. O que poderia significar a Educação Matemática Crítica para diferentes grupos de estudantes?. *Revista Paranaense de Educação Matemática*, v. 6, n. 12, p. 18–37, 2017.
- SKOVSMOSE, O. *Critical Mathematics Education*. Dordrecht: Springer, 2023.
- SOARES, G. A.; FANTINATO, M. C. Etnomatemática como um caleidoscópio de olhares e concepções. *Revista Latinoamericana de Etnomatemática Perspectivas Socioculturales de la Educación Matemática*, v. 16, p. 78 - 97, 2023.
- WOOD, E. M. *Democracia contra capitalismo: a renovação do materialismo histórico*. São Paulo, SP: Boitempo, 2006.

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