

## Decolonial perspectives for mathematics teaching: a reflection on some silenced epistemes

### ARTICLE

Jailda da Silva dos Santos<sup>i</sup> 

Universidade Estadual do Sudoeste da Bahia, Jequié, BA, Brasil

Zulma Elizabete de Freitas Madruga<sup>ii</sup> 

Universidade Federal do Recôncavo da Bahia, Amargosa, BA, Brasil

### Abstract

This essay aims to discuss didactic-pedagogical possibilities for teaching Mathematics from an anti-racist perspective, which problematizes the supposed neutrality of school knowledge and promotes the recognition and appreciation of plural epistemologies, rooted in different sociocultural contexts. To this end, we conducted systematic searches and readings of academic works discussing ethnomathematics, decoloniality, and anti-racist mathematics education, aiming to construct arguments and critical reflections on mathematics teaching and the lack of discussions that guide Law 10.639/2003. The analysis was conducted through dialogues and reflections from a counter-hegemonic perspective and by proposing how mathematics can foster diverse discussions about other knowledges, not solely from a Eurocentric perspective. The results allow us to perceive other decolonial teaching practices and to learn about Black women who contributed to the development of mathematics and society, drawing on the knowledge of this science long considered masculinized and white.

**Keywords:** Mathematical Education. Ethnomathematics. Education for Diversity. Ethnic Relations. Epistemological Approach.

### Perspectivas decoloniais para o ensino de matemática: uma reflexão acerca de epistemes silenciadas

### Resumo

Este ensaio objetiva discutir possibilidades didático-pedagógicas para o ensino de Matemática a partir de uma perspectiva antirracista, que problematize a pretensa neutralidade dos saberes escolares e promova o reconhecimento e a valorização de epistemologias plurais, enraizadas em diferentes contextos socioculturais. Para tanto, foram realizadas buscas e leituras sistemáticas em trabalhos acadêmicos que discutem Etnomatemática, decolonialidade e Educação Matemática Antirracista, com vista a construir argumentos e reflexões críticas acerca do ensino de Matemática e discussões que pautem a Lei 10.639/2003. A análise deu-se por meio de diálogos e reflexões numa perspectiva contra hegemônica e na proposição de como a Matemática pode realizar discussões diversas acerca de saberes outros, não somente numa concepção eurocêntrica. Os resultados possibilitam perceber outras práticas de ensino decoloniais, e conhecer mulheres negras que contribuíram para o desenvolvimento da Matemática e da sociedade,

valendo-se dos saberes desta ciência tida por muito tempo como masculinizada e branca.

**Palavras-chave:** Educação Matemática. Etnomatemática. Educação para a Diversidade. Relações Étnicas. Abordagem Epistemológica.

## 1 Introduction: antiracist mathematics education – plural knowledges

2

This essay originates from an assessment activity developed within the course *Epistemology and Sociology of Knowledge: Foundations for Teaching and Research in Science Education*, taught by Prof. Dr. Bruno Ferreira dos Santos in the doctoral program of the Graduate Program in Science Education and Teacher Education at the State University of Southwest Bahia (Campus Jequié, Bahia, Brazil).

The enactment of Law No. 10,639/2003—later expanded by Law No. 11,645/2008—represents a significant milestone in Brazilian educational policy by mandating the inclusion of African, Afro-Brazilian, and Indigenous history and culture in the Basic Education curriculum. Beyond mere legal compliance, these regulations articulate an ethical and pedagogical commitment to constructing a school system grounded in social justice and epistemic equity. Despite their normative importance, however, substantial challenges remain regarding the effective implementation of these laws, particularly in ensuring the transversal integration of historically marginalized knowledges across all areas of knowledge.

Law No. 10,639/2003, which mandates the teaching of African and Afro-Brazilian history in Basic Education in both public and private schools, may be understood as a means of demonstrating to students that knowledge produced by diverse peoples and cultures is equally relevant to teaching and learning processes, while fostering the critical formation of citizens. As Gonçalves and Coelho (2025) observe, teaching and learning practices are frequently structured around a Eurocentric matrix.

Subsequently, this law was expanded through Law No. 11,645/2008 to establish the mandatory teaching of Indigenous history as well. Notwithstanding the importance of

these legislative advances, it is necessary to reflect on the implications of promoting curricular diversity solely in response to legal obligation. Each people and each culture have generated forms of knowledge that have contributed to social development and to the constitution of scientific knowledge widely employed in everyday life. Such contributions therefore warrant explicit recognition within the curriculum.

In the field of Mathematics Education in particular, there is a predominance of Eurocentric perspectives that render invisible the contributions of African, Afro-descendant, and Indigenous peoples to the constitution of mathematical knowledge (Gonçalves; Coelho, 2025). In this context, envisioning an antiracist Mathematics Education requires moving beyond the formal compliance with legislation and demands a break with hegemonic epistemologies, as well as the recognition of narratives, practices, and intellectual productions emerging from subalternized contexts. As Pinheiro (2019, p. 334) argues, “it is necessary to deconstruct such perspectives not only to comply with the Law of Guidelines and Bases of National Education [...], but fundamentally to recover narratives, intellectual productions, and positive ancestral references.”

The challenge, therefore, lies not merely in incorporating content, but in reconfiguring the pedagogical practices and theoretical frameworks that underpin the school curriculum. Valuing the knowledge produced by different cultural groups should not be a punctual response to legal requirements, but rather an ongoing pedagogical stance that recognizes knowledge as a collective and situated construction.

This position does not seek to minimize the impact of these laws on the educational landscape. On the contrary, it acknowledges them as an achievement resulting from a historical process of struggles and demands for a more equitable and inclusive education. Its purpose is to emphasize that teaching and learning processes should not be restricted to hegemonic knowledge, but should open space for practices that value the peoples and cultures that shape students' social environment and lived realities (Melo; Souza, 2025).

From this perspective, counter-hegemonic practices should be highlighted across different spaces and contexts so that more individuals feel recognized and are encouraged to advocate for the appreciation of their peoples, their knowledge, and their cultural

expressions. Accordingly, the implementation of these laws in educational institutions should not be limited to the subject of History, but should encompass all areas of knowledge, since each person has forms of knowledge that relate to different disciplinary fields.

4 According to Silva, Costa, and Pinheiro (2021, p. 2), “there is still strong resistance to these studies both in Basic Education and in teacher education, especially outside the fields of the humanities and social sciences, as if the responsibility for promoting this debate belonged exclusively to them.” In this scenario, with regard to Mathematics, a discipline within the exact sciences, the Ethnomathematics Program emerges as an important pathway for promoting counter-hegemonic educational practices by highlighting mathematical concepts, techniques, and forms of reasoning that arise from specific cultural, social, and historical contexts.

Proposed by Ubiratan D’Ambrosio (2008, 2019), this program values the distinctive ways in which diverse cultural groups develop and apply mathematical knowledge in their everyday practices, challenging the assumption that Mathematics is a neutral, universal, and decontextualized science. It involves recognizing that Mathematics, like other fields of knowledge, is a human, historical, and cultural construct, collectively produced by different peoples over time.

This essay seeks to promote a critical reflection on the teaching of Mathematics, with an emphasis on the recognition of historically silenced epistemologies. Based on a theoretical–conceptual approach grounded in Ethnomathematics and the Epistemologies of the South, it aims to problematize the centrality of Eurocentric rationality within the school curriculum and to indicate didactic-pedagogical possibilities aligned with a decolonial, critical, and antiracist perspective.

The discussion is supported by a bibliographic mapping of academic works addressing decoloniality, local knowledges, and Antiracist Mathematics Education, thereby contributing to debates on the effective implementation of Law No. 10,639/2003 (Brazil, 2003). To this end, the objective is to discuss didactic-pedagogical possibilities for Mathematics teaching from an antiracist perspective that questions the presumed neutrality

of school knowledge and promotes the recognition and appreciation of plural epistemologies rooted in diverse sociocultural contexts.

## 2 Ethnomathematics and Epistemologies of the South: Decolonial Dialogues

5

Mathematics teaching in the Brazilian school context has largely been grounded in a Eurocentric epistemic framework, in which concepts, historical narratives, and scientific productions reflect a white, Western, and male hegemony. Such a curricular structure silences other ways of producing and validating mathematical knowledge originating from Indigenous, African, and Afro-Brazilian peoples, among other historically subalternized groups. As James (2022) points out, many forms of knowledge incorporated into modern science were appropriated from marginalized communities, delegitimizing their origins and erasing the contributions of these subjects from the official history of science.

This perspective is directly related to what has come to be known as the coloniality of knowledge, one of the dimensions of coloniality proposed by Maldonado-Torres (2007), which operates as a logic of power that survives historical colonialism and persists within contemporary educational structures. In addition to this dimension, other forms of coloniality have been proposed by different authors, such as the Coloniality of Knowledge (Maldonado-Torres), the Coloniality of Power (Quijano, 2005), and the Coloniality of Nature (Walsh, 2012).

The *Coloniality of Knowledge* establishes Europe as the exclusive reference for knowledge production, suppressing epistemologies derived from other cultural matrices. The *Coloniality of Power* is sustained by a global racialized social structure that maintains non-white peoples in positions of subalternity. The *Coloniality of Being* operates through the dehumanization and ontological negation of colonized subjects, promoting the valorization of white identities over others. The *Coloniality of Nature*, in turn, disrupts ancestral cosmologies by separating nature from culture and imposing a mechanistic, utilitarian, and fragmented view of life.

From this theoretical framework, it becomes evident that Mathematics teaching—by privileging only knowledge validated by Western institutions—reproduces the logic of the coloniality of knowledge. A paradigmatic example is the Pythagorean theorem<sup>1</sup>, whose underlying principles were already present in African civilizations long before their formalization by Greek mathematicians, yet whose authorship remains exclusively attributed to the Hellenic tradition. Such erasures reinforce the need to reconstruct the curriculum from a decolonial perspective capable of recognizing and incorporating plural knowledges.

Reflecting on strategies to overcome these patterns of coloniality is profoundly necessary in order to reconnect with our histories, epistemologies, and identities. It involves an ongoing process of unlearning and self-deconstruction that enables reconstruction through new affective relationships with oneself (Pinheiro, 2019, p. 334-335).

As Caurio, Cassiani, and Giraldi (2021, p. 641) argue, it is urgent to “(re)think the issues surrounding the production and validation of knowledge” through the recognition of the *Epistemologies of the South*—an epistemic horizon that emerges from the social struggles of historically silenced peoples. These epistemologies propose a rupture with modern epistemological universalism by affirming the legitimacy of localized, situated forms of knowledge constructed in dialogue with the historical, cultural, and spiritual experiences of different peoples.

[...] we put forward the Epistemologies of the South as a possible epistemological horizon so that we may (re)think the issues involving the production and validation of knowledge. Other epistemologies that emerge from the social struggles of peoples and groups historically silenced and rendered invisible (Caurio; Cassiani; Giraldi, 2021, p. 641).

It is within this framework that Ethnomathematics is situated. The ideas advanced by D’Ambrosio (2008, 2019) present Ethnomathematics as understood through the roots

---

<sup>1</sup> “In a right triangle, the area of the square on the hypotenuse is equal to the sum of the areas of the squares on the legs,” a relationship known in Euclidean Geometry as the Pythagorean Theorem. However, this result had already been used by Babylonian, Egyptian, and Chinese civilizations centuries before Pythagoras. Available at: [https://www2.fc.unesp.br/revistacqd/v6/v6\\_art3.pdf](https://www2.fc.unesp.br/revistacqd/v6/v6_art3.pdf). Accessed on: Dec. 15, 2025.

*ethno + mathema + tics*. *Ethno* refers to the different environments of investigation and learning, whether cultural, social, or natural. *Mathema* encompasses the ways of understanding, teaching, and engaging with different realities and with diverse conceptions of Mathematics. *Tics* refers to the techniques and procedures used by the cultural group under study to deal with everyday situations.

Its broader aim is to give meaning to the ways of knowing and doing across diverse cultures and to “recognize how and why groups of individuals, organized as families, communities, professions, tribes, nations, and peoples, carry out their mathematical practices, such as counting, measuring, comparing, and classifying” (D’Ambrosio, 2008, p. 7).

By shifting the focus away from Mathematics as a neutral, universal, and decontextualized science, Ethnomathematics aligns with what Mignolo (2019) calls epistemic delinking—the first step toward the construction of a decolonial rationality. Such delinking involves breaking with the Western monopoly over knowledge production and recognizing that truth is neither singular nor universal, but plural, contingent, and situated.

Thus, delinking Mathematics from the coloniality of knowledge allows students to conceive of Mathematics as something connected to their own realities and to the knowledge produced by their ancestors. In this sense, Ethnomathematics does not seek to hierarchize forms of knowledge or to replace the dominant scientific tradition, but rather to create conditions for students to access and engage in dialogue with multiple epistemologies, thereby expanding their possibilities for understanding and acting in the world. As D’Ambrosio (2008) emphasizes, the aim is to provide learners with tools that enable them to recognize different ways of knowing and to choose those that are most meaningful in relation to the problem situations they encounter in their lived realities.

From this perspective, the dialogue between Ethnomathematics and the Epistemologies of the South offers a consistent theoretical foundation for the construction of a decolonial Mathematics Education, committed to valuing historically marginalized knowledges and to promoting cognitive justice within the school context. Such a proposal goes beyond the mere inclusion of cultural content, implying instead a profound

transformation in pedagogical relationships, teaching practices, and the ways in which knowledge is legitimized.

### 3 Methodology

8

This article is configured as a qualitative theoretical essay, as defined by Bogdan and Biklen (2010), guided by the purpose of critically reflecting on ways of teaching Mathematics from counter-hegemonic perspectives. The essay, as a mode of inquiry, is not grounded in empirical verification, but in the conceptual, argumentative, and analytical elaboration of ideas that seek to challenge established knowledge and propose new ways of conceiving it. As Meneghetti (2011, p. 327) states, the essay “is a permanent reflection in which the central strength lies less in empirical evidence and more in the attributes of reason that think reality.”

The aim of this study is not to present generalizable results, but to contribute to the production of meanings and pedagogical possibilities capable of disrupting the Eurocentric tradition of Mathematics Education, which has been grounded in exclusionary and monocultural epistemologies. In this sense, the essay is situated within the field of critical epistemologies, adopting as its theoretical basis discussions on Ethnomathematics, Antiracist Education, and Decoloniality, articulated with the struggle for cognitive justice and the recognition of historically silenced knowledges.

The writing was developed through an interpretative theoretical review, conducted by means of critical and dialogical readings of authors who problematize the coloniality of knowledge and advocate for the emergence of other epistemologies rooted in the experiences of subalternized ethnic-racial groups. The works of D’Ambrosio (2008, 2019), Walsh (2012), Mignolo (2019), Pinheiro (2019), and Caurio, Cassiani, and Giraldi (2021), among others, were fundamental to the construction of the argument and to the proposal of alternative pathways for Mathematics teaching committed to equity and epistemological plurality.

The analysis undertaken in this essay was guided by the construction of interpretative categories emerging from the articulation between the theoretical framework and the issues raised within the field of Mathematics Education. Two main categories were developed: (i) Gender and Decoloniality: Breaking Silences and Invisibility; and (ii) Local Knowledges and Epistemic Resistance: The Convergence between Ethnomathematics and Decolonial Thought.

These categories seek to challenge the notion that Mathematics is a neutral, decontextualized, and universal science, revealing instead that it has been historically constructed under the influence of race, class, and gender biases, and predominantly represented by white male subjects.

Thus, the methodological choice of a theoretical essay is justified by the commitment to fostering a critical and propositional reflection, motivated by the ethical imperative to question the exclusionary structure of mathematical knowledge production. It constitutes an exercise in narrative reconstruction aimed at reinscribing within the field of Mathematics Education the voices and epistemologies that have historically been denied. As Pinheiro (2019, p. 331) argues, “it is necessary to educate youth by presenting diverse and decolonial narratives of the different civilizational milestones that have constituted us,” since the persistence of a single historical narrative centered on Europe diminishes epistemic plurality and undermines the construction of a genuinely emancipatory education.

#### 4 Gender and decoloniality: breaking silences and invisibility

The history of Mathematics shows that its teaching was once regarded as accessible only to men, while women were directed toward learning tasks related to caregiving or domestic responsibilities.

According to D’Ambrosio (2005):

Mathematics has been conceptualized as the science of numbers and forms, of relations and measures, of inferences, and its characteristics point to precision, rigor, and exactness. The great heroes of mathematics, that is, those individuals

historically identified as responsible for the advancement and consolidation of this science, are located in ancient Greece and later, in the Modern Age, in the central countries of Europe, especially England, France, Italy, and Germany. The most frequently remembered names are Thales, Pythagoras, Euclid, Descartes, Galileo, Newton, Leibniz, Hilbert, Einstein, and Hawking. These are ideas and men originating from the North of the Mediterranean (D'Ambrosio, 2005, p. 114).

10

Such a representation is not neutral. It expresses an exclusionary epistemology that silences the contributions of women, non-European peoples, and racialized subjects to the constitution of mathematical knowledge. Women's presence in the exact sciences has been systematically rendered invisible, as they have historically been excluded from the spaces of production, circulation, and validation of knowledge.

Even so, Hypatia of Alexandria, a fourth-century philosopher and mathematician, challenged the patriarchal norms of her time by publicly dedicating herself to teaching and scientific inquiry, with a focus on studies in algebra and arithmetic. Her brutal assassination, motivated by religious and gender-based persecution, reveals the structural violence that accompanies the epistemic exclusion of women (Oliveira, 2022).

An intersectional analysis of gender, race, and science broadens the critique of the coloniality of knowledge by highlighting the trajectories of Black women who, in addition to confronting sexism, also challenged structural racism within deeply elitist and racialized contexts.

One such example is Katherine Goble Johnson (1918–2020), an African American mathematician who played a crucial role in performing orbital calculations for the National Aeronautics and Space Administration (NASA), being responsible for fundamental operations in U.S. space missions (Houston, 2019). Katherine Johnson stands as a symbol of Black intellectual resistance, of the intersection of gender, race, and science, and of the capacity to break barriers within a highly elitist, masculinized, and racialized field. Her trajectory demonstrates that Mathematics has never been neutral and that the knowledge produced by Black women has also contributed to major milestones in human history, even though such contributions were long rendered invisible, as noted by Houston (2019).

Her story, portrayed in the film *Hidden Figures*<sup>2</sup>, reveals not only the technical excellence but also the political resistance of these women who, even under segregation, asserted their presence and competence within spaces marked by institutional exclusion (Houston, 2019). Johnson's trajectory thus represents a rupture with the hegemonic logic that positions Mathematics as an exclusively white and male domain. Her work, alongside that of other Black women, demonstrates that science has never been neutral and that the knowledge produced by subalternized subjects has contributed—and continues to contribute—to major milestones in human history. Decoloniality, in this context, requires that these histories be recognized as constitutive elements of mathematical production, rather than as exceptions or curiosities.

Another fundamental contribution to this process of epistemic resignification is that of Gloria Ford Gilmer (June 28, 1928 – August 25, 2021), the first Black woman to earn a Ph.D. in Applied Mathematics in the United States and a scholar who articulated Afro-American cultural practices with everyday mathematical knowledge. Gilmer was a co-founder of the International Study Group on Ethnomathematics (ISGEm), alongside Ubiratan D'Ambrosio, Patrick Scott, and Gilbert Cuevas, and was the only woman in this pioneering group (Fernandes; Passos, 2024). Her theoretical production highlights the presence of Mathematics within the fabric of Black women's daily lives, in activities such as hair braiding and geometric patterns in quilts and textiles. In doing so, her work expands the concept of mathematical knowledge beyond Eurocentric and strictly academic parameters.

By bringing these forms of knowledge to light, Ethnomathematics—dialoguing with the assumptions of the Epistemologies of the South and with decolonial thought—proposes a rupture with the coloniality of knowledge that permeates Mathematics Education. As

---

<sup>2</sup> The film *Hidden Figures*, which portrays mathematicians Katherine Johnson, Dorothy Vaughan, and Mary Jackson, is based on the book *Hidden Figures* by Margot Lee Shetterly. An African American author born in Hampton, home to the Langley Research Center, she grew up in a family connected to NASA and became interested in the stories of the Black women who worked there. Available at: <http://blogs.unicamp.br/cienciapelosolhosdelas/2020/04/17/estrelas-alem-do-tempo-mulheres-cientistas-nasa/>. Accessed on: Dec. 15, 2025.

Pinheiro (2019) argues, it is necessary to move beyond a single narrative and to promote the recognition of the multiple contributions of peoples who have historically been cast into the abyss of forgetting.

In this sense, the inclusion of female and racialized references in Mathematics teaching should not be treated as a curricular add-on, but as part of a pedagogical commitment to cognitive justice that acknowledges the effects of gender and racial structures on the scientific field. Overcoming the historical silencing of women—particularly Black women—in Mathematics constitutes an essential condition for the construction of an education that is genuinely emancipatory, plural, and decolonial.

## 5 Local knowledges and epistemic resistance: the convergence between Ethnomathematics and Decolonial Thought

The concept of Ethnomathematics was formulated by Ubiratan D’Ambrosio in the 1970s as a response to the limitations of hegemonic Mathematics, historically shaped by Eurocentric perspectives. According to the author, the term refers to multiple ways of understanding, representing, and acting in the world (*mathema*), developed by different cultural groups (*ethnos*) through everyday practices, techniques, and their own languages (*tics*) (D’Ambrosio, 2005, 2008, 2019). This proposal challenges the monolithic notion of Mathematics and affirms the existence of multiple “mathematics,” each historically and culturally situated.

For D’Ambrosio (2019), Ethnomathematics is not restricted to the practices of traditional ethnic groups, but also encompasses the mathematical knowledge of workers, artisans, healers, fishers, and other historically marginalized subjects. Recognizing these practices means challenging the epistemic hierarchies that delegitimize non-European and non-academic forms of knowledge. Mathematics, like any science, is a social and historical product and is therefore shaped by symbolic and political disputes.

Authors such as Gerdes (1996) expanded this debate by proposing concepts such as “oppressed mathematics,” “informal mathematics,” and “non-standardized

mathematics”—expressions that expose the epistemic violence produced by a Eurocentric model of science. Although valuable, these ideas were later incorporated and further developed within the theoretical and methodological scope of Ethnomathematics, which has become established as an international and transdisciplinary field of research. Numerous efforts can be observed to move away from Eurocentric knowledge and to enable the presentation and recognition of diverse mathematical knowledges.

In this process, it is important to highlight that the Ethnomathematics Program was directly influenced by African experiences, particularly after D’Ambrosio’s visit to Mali in 1970. The centrality of Africa in this context is often erased by narratives that attribute the origins of Mathematics exclusively to ancient Greece. However, as James (2022) argues, there is substantial evidence that many foundations attributed to the Greeks are, in fact, inheritances from Egyptian peoples and other African civilizations. The right-triangle theorem known as the “Pythagorean Theorem,” for example, was already used in construction practices and land demarcation long before its Greek formalization.

This critique of epistemic erasure resonates with decolonial thought, which denounces the coloniality of knowledge (Quijano, 2005) and advocates the revaluation of local, ancestral, and peripheral knowledges. In dialogue with decoloniality, Ethnomathematics strengthens the struggle against epistemicide (Santos, 2008), functioning as a tool of resistance, particularly within Basic Education.

Rosa and Orey (2013) consider Ethnomathematics to be a Lakatosian research program, with a hard core grounded in principles such as transdisciplinarity, transculturality, cultural diversity, and the recognition of local knowledges. The protective belt of the program is articulated with other fields, such as Cultural Anthropology, the History of Mathematics, and Mathematical Modeling. “The protective belt of the ethnomathematics program consists of auxiliary theories and hypotheses that are created or discarded in order to protect the integrity of the hard core of this program” (Rosa; Orey, 2013, p. 3441).

Thus, the program proves fertile in generating hypotheses, pedagogical strategies, and innovative methodological approaches. Dowling’s critique, cited by Knijnik (1996), which accuses Ethnomathematics of adopting a monoglossic discourse, is countered by

D'Ambrosio (2008), who defends the right of subjects to access and preserve their own ways of knowing while also engaging with other forms of knowledge.

In this sense, educational practices that incorporate local knowledges—especially those of African origin—constitute concrete strategies of epistemic resistance. The use of African games in the classroom, such as those belonging to the Mancala family, exemplifies this approach.

Mancala is a game originating from the African continent, particularly associated with Egypt, with its origins dated between 2000 BCE and 7000 BCE. The term *mancala* derives from the Arabic word *naqaala*, meaning “to move.” It is a board game composed of multiple concavities used for sowing and harvesting pieces. It is noteworthy that there are more than 200 variations of the game, with names and specific rules differing according to region. Beyond fostering cognitive abilities, logical reasoning, and counting skills, these ancestral games recover cultural memories and affirm the oral and ludic traditions of African peoples.

**Figure 1 – Mancala being played**



Source: *Primeiros Negros* website.

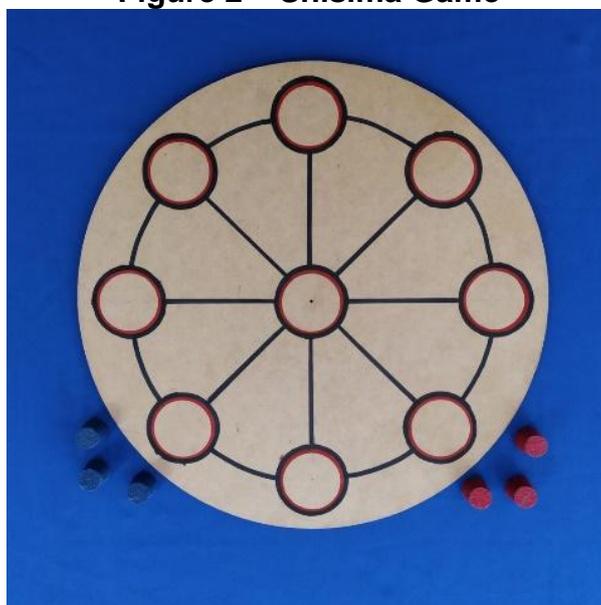
African games from the Mancala family, in addition to being widely popular across the continent, are considered among the oldest games in the world, possibly emerging

alongside the origins of civilization itself. “These are board games that allow students to work, often without realizing it, with basic mathematical concepts such as laterality, notions of quantity and sequence, predecessor and successor” (Barreto, 2016, p. 40).

Among the games that can be integrated into the Mathematics curriculum, *Matacuzana*, *Shishima*, and *Yoté* stand out. *Matacuzana*, originating from Mozambique, enables the exploration of counting, quantity concepts, comparison, and strategic thinking. *Shishima*, similar to tic-tac-toe, uses an octagonal board and allows for the investigation of symmetry, geometry, and spatial positioning. *Yoté*, comparable to checkers, involves logical reasoning and anticipation of moves, while also encouraging interaction among peers (Neto; Souza; Alencar, 2019).

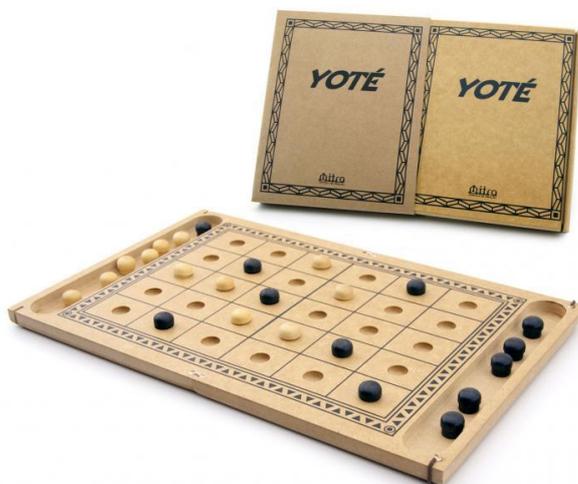
15

**Figure 2 – Shisima Game**



Source: Museum of Mathematics, Federal University of Minas Gerais (UFMG).

**Figure 3 –Yoté Game**



Source: *Miltra Oficina de Criação* blog

**Figure 4 – Matacuzana Game**



Source: *Ciência Hoje das Crianças* website

These games, beyond their ludic dimension, represent culturally situated forms of mathematical knowledge. When incorporated into the school context, they disrupt the monocultural model of teaching and contribute to the recognition of Afro-Brazilian identities, in alignment with Law No. 10,639/2003 (Brazil, 2003). More than a methodological

approach, this constitutes a political and ethical stance: affirming that other worlds and other knowledges are both possible and necessary within the school environment.

Therefore, by articulating Ethnomathematics and decolonial thought, a pedagogical proposal emerges that challenges the coloniality of knowledge and contributes to the construction of an Antiracist Mathematics Education. This approach values local knowledges, questions exclusionary paradigms, and expands learning possibilities, making Mathematics teaching more human, inclusive, and politically committed to social justice.

## 6 Final considerations

This essay aimed to discuss didactic-pedagogical possibilities for Mathematics teaching from an antiracist perspective that problematizes the presumed neutrality of school knowledge and promotes the recognition and appreciation of plural epistemologies rooted in diverse sociocultural contexts. As Rios and Araújo (2025, p. 19) state, “It is necessary to adopt an expanded perspective [...], grounded in critical-reflective thinking, rather than in a reductionist approach oriented toward a single and universal idea and mode of thought, which rejects contradiction and other worldviews and diverse epistemologies.”

Based on a systematic review of the literature and recent theoretical contributions, this study sought to substantiate a critical reflection on Mathematics teaching grounded in counter-hegemonic epistemes. The analyses indicate that it is possible to promote educational practices aligned with the guidelines of Law No. 10,639/2003, fostering the development of an Antiracist Mathematics Education that values other knowledges—especially those rooted in African and Afro-Brazilian matrices—as also highlighted by Costa (2024).

One of the aspects evidenced in this study is that, even within academic discussions addressing gender, race, and ethnicity in the field of Mathematics Education, there remains a predominance of female representations centered on Eurocentric figures, such as Hypatia. In contrast to this logic, the present essay highlighted the trajectories of Black women who have also made significant contributions to the development of

Mathematics, thereby expanding the historical and epistemic repertoire available to students.

It is important to emphasize that the intention was not to replace one narrative with another, but rather to demonstrate that other histories are possible—histories that challenge the linearity of the traditional History of Mathematics and move toward a decolonial perspective. In the same movement, African-origin games that are still underexplored within the Brazilian school context were presented, indicating pathways for pedagogical practices that engage with ancestry, popular knowledge, and playfulness as a meaningful mode of learning.

It can be concluded that this essay contributes not only by proposing ways to incorporate antiracist practices into Mathematics teaching, but also by valuing historically silenced knowledges and fostering affirmative identity processes. By recognizing the relevance of African and Afro-Brazilian contributions to science and education, it reaffirms a commitment to a democratic, plural, and socially engaged school—one capable of embracing diversity as both an epistemic and ethical value.

## Acknowledgments

To the National Council for Scientific and Technological Development of Brazil, for funding the Research Project “Valuing local cultures through Ethnomodelling and its relations with the teaching of Mathematics”, approved in the CNPq/MCTI Call for Proposals No. 10/2023 – Universal Call for Proposals.

## References

BARRETO, G. B. B. **O ensino de matemática através de jogos educativos africanos: um estudo de caso em uma turma de educação de jovens e adultos (EJA) de uma escola municipal de Aracaju.** 2016. 136 f. Dissertação (Pós-Graduação em Ensino de Ciências e Matemática) - Universidade Federal de Sergipe, São Cristóvão, 2016.

BOGDAN, R. C.; BIKLEN, S. K. **Investigação qualitativa em educação: uma introdução à teoria e aos métodos.** Lisboa: Porto Editora, 2010.

BRASIL. **Lei nº 10.639, de 9 de janeiro de 2003.** Altera a Lei nº 9.394, de 20 de dezembro de 1996, que estabelece as Diretrizes e Bases da Educação Nacional, para incluir no currículo oficial da Rede de Ensino a obrigatoriedade do ensino de História e Cultura Afro-Brasileira e Africana e dá outras providências. Diário Oficial da União: seção 1, Brasília, DF, 10 jan. 2003. Disponível em:

[http://www.planalto.gov.br/ccivil\\_03/leis/2003/L10.639.htm](http://www.planalto.gov.br/ccivil_03/leis/2003/L10.639.htm). Acesso em: 15 jul. 2025.

BRASIL. **Lei nº 11.645, de 10 de março de 2008.** Altera a Lei nº 9.394, de 20 de dezembro de 1996, que estabelece as Diretrizes e Bases da Educação Nacional, para incluir no currículo oficial da Rede de Ensino a obrigatoriedade do ensino de História e Cultura Afro-Brasileira e Indígena e dá outras providências. Diário Oficial da União: seção 1, Brasília, DF, 11 mar. 2008. Disponível em:

[http://www.planalto.gov.br/ccivil\\_03/\\_ato2007-2010/2008/lei/l11645.htm](http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2008/lei/l11645.htm). Acesso em: 15 jul. 2025.

CAURIO, M. S.; CASSIANI, S; GIRALDI, P. M. O Sul enquanto horizonte epistemológico: da produção de conhecimentos às pedagogias decoloniais. **Revista de Ensino de Biologia da SBEnBio**, p. 680-699, 2021.

COSTA, A. P. da. Intervenção pedagógica antirracista à Educação Escolar Quilombola: uma proposta teórica para o ensino de Geometria. **Rev. Pemo**, Fortaleza, v. 6, p. e11013, 2024. Disponível em:

<https://revistas.uece.br/index.php/revpemo/article/view/11013>. Acesso em: 29 jul. 2025.

D'AMBROSIO, U. Sociedade, cultura, matemática e seu ensino. **Educação e pesquisa**, v. 31, p. 99-120, 2005.

D'AMBROSIO, U. O Programa Etnomatemática: uma síntese (The Ethnomathematics Program: A summary). **Acta Scientiae**, v. 10, n. 1, p. 07-16, 2008.

D'AMBROSIO, U. **Etnomatemática: elo entre a tradição e a modernidade.** 6ª ed. Belo Horizonte: Autêntica, 2019.

FERNANDES, J. L. S; PASSOS, J. C. Etnomatemática: um Programa Antirracista. **Com a Palavra, o Professor**, v. 9, n. 24, p. 99-118, 2024.

GERDES, P. Etnomatemática e educação matemática: uma panorâmica geral. **Quadrante**, v. 5, n. 2, p. 105-138, 1996.

GONÇAVES, A. S.; COELHO, W. N. B. Currículos nortistas reestruturados pela Base Nacional Comum Curricular: a (não) subversão do eurocentrismo e do sudestecentrismo. **Educação e Pesquisa**, São Paulo, v. 51, e286839, 2025. Disponível em <https://www.scielo.br/j/ep/a/SWS8DHbx4HYjxKKW8FkXq4n/>. Acesso em: 29 jul. 2025.

HOUSTON, J. L. The Life and Pioneering Contributions of an African American Centenarian: Mathematician Katherine G. Johnson. **Notices of the American Mathematical Society**, v. 66, n. 3, 2019. Disponível em <https://www.ams.org/journals/notices/201903/rnoti-p324.pdf?adat=March%202019&trk=1809&cat=feature&galt=feature> Acesso em: 29 jul. 2025.

JAMES, G. G. M. **O legado roubado**: A filosofia grega é a filosofia egípcia roubada. Editora Ananse, 2022.

KNIJNIK, G. **Exclusão e resistência**: educação matemática e legitimidade cultural. Porto Alegre, RS, Artes Médicas, 1996.

MALDONADO-TORRES, Nelson. Sobre la colonialidad del ser: contribuciones al desarrollo de un concepto. *In*: CASTRO-GÓMEZ, S.; GROSFUGUEL, R. (orgs.) **El giro decolonial**. Reflexiones para una diversidad epistémica más allá del capitalismo global. Bogotá: Universidad Javeriana-Instituto Pensar, Universidad Central-IESCO, Siglo del Hombre Editores, 2007.

MELO, L. N. dos S.; SOUZA, E. Q. de. Desvelando as relações raciais nas práticas pedagógicas: uma leitura decolonial do cotidiano escolar. **Educ. Form.**, [S. l.], v. 10, p. e14203, 2025. Disponível em: <https://revistas.uece.br/index.php/redufor/article/view/14203>. Acesso em: 29 jul. 2025.

MENEGHETTI, F. K. O que é um ensaio-teórico? **Revista de administração contemporânea**, v. 15, p. 320-332, 2011.

MIGNOLO, W. D. **A colonialidade está longe de ter sido superada, logo, a decolonialidade deve prosseguir**. São Paulo: Museu de Arte de São Paulo Assis Chateaubriand, 2019.

NETO, F. T. S; SOUZA, M. N. B; ALENCAR, A. C. Jogos africanos: uma ferramenta para o professor de Matemática. *In*: **Anais... VI JOIN / Brasil – Portugal**, ISSN: 2594-8318, Açores - Portugal 2019.

QUIJANO, A. Colonialidade do poder, eurocentrismo e América Latina. *In*: LANDER, Edgardo (org). **A colonialidade do saber**: eurocentrismo e ciências sociais. Perspectivas latinoamericanas. CLACSO, Buenos Aires, Argentina. 2005.

RIOS, F. W. S.; ARAÚJO, G. C. de. A temática História e Cultura Indígena em programas de ensino dos campi do IFTO, conforme a Lei nº 11.645/2008. **Educ. Form.**, [S. l.], v. 10, p. e14005, 2025. Disponível em:

<https://revistas.uece.br/index.php/redufor/article/view/14005>. Acesso em: 29 jul. 2025.

ROSA, M; OREY, D. C; A Etnomatemática como um programa de pesquisa lakatosiano. *In: Actas... VII CIBEM*, n. 0797, p. 3439, 2013.

OLIVEIRA, G. R. **Mulheres na Matemática e suas contribuições**. Trabalho de Conclusão de Curso (TCC). 2022. 35 f. Escola de Formação de Professores e Humanidades - Pontifícia Universidade Católica de Goiás (PUC Goiás), Goiás, 2022.

PINHEIRO, B. C. S. Educação em ciências na escola democrática e as relações étnico-raciais. **Revista Brasileira de Pesquisa em Educação em Ciências**, p. 329-344, 2019.

SANTOS, B. S. **A gramática do tempo: para uma nova cultura política**. São Paulo: Cortez, 2008.

SILVA, W. D. A; COSTA, A. S; PINHEIRO, B. C. S. Educação para relações étnico-raciais na constituição curricular da Licenciatura em Química no Ceará: que cor tem a formação de professores(as)? **Revista Cocar**, [S. l.], v. 15, n. 33, 2021.

WALSH, C. Interculturalidad y (de)colonialidad: Perspectivas críticas y políticas. **Revista Visão Global**, Joaçaba, SC, v. 15, n. 1-2, p. 61-74, jan./dez. 2012.

<sup>i</sup> **Jailda da Silva dos Santos**, ORCID: <https://orcid.org/0000-0002-2061-0178>

Universidade Estadual do Sudoeste da Bahia (UESB)

Grupo de Estudos e Pesquisas sobre Tendências da Educação Matemática e Cultura (GEPTEMaC) Doutoranda no Programa de Pós-graduação em Educação Científica e Formação de Professores (UESB). Mestre em Educação em Ciências e Matemática (UESC). Licenciada em Matemática pela Universidade Federal do Recôncavo da Bahia (UFRB).

Author contribution: administração do projeto, análise formal, conceituação, curadoria de dados, escrita – primeira redação, investigação, metodologia, validação.

Lattes: <http://lattes.cnpq.br/5515038503260357>

E-mail: [jaildasyva@hotmail.com](mailto:jaildasyva@hotmail.com)

<sup>ii</sup> **Zulma Elizabete de Freitas Madruga**, ORCID: <https://orcid.org/0000-0003-1674-0479>

Universidade Federal do Recôncavo da Bahia (UFRB)

Grupo de Estudos e Pesquisas sobre Tendências da Educação Matemática e Cultura (GEPTEMaC) Doutora em Educação em Ciências e Matemática (PUCRS). Docente no Centro de Formação de Professores (UFRB). Professora permanente do Programa de Pós-graduação em Educação Científica e Formação de Professores (UESB).

Author contribution: administração do projeto, análise formal, conceituação, curadoria de dados, escrita – revisão e edição, obtenção de financiamento, supervisão, validação e visualização.

Lattes: <http://lattes.cnpq.br/2942749670170194>  
E-mail: [betemadruga@ufrb.edu.br](mailto:betemadruga@ufrb.edu.br)

**Responsible publisher:** Genifer Andrade.

22

**Ad hoc specialist:** Paulo Melgaço da Silva Junior, Tânia Gorayeb Sucupira and Lia Ciomar Macedo de Faria.

**How to cite this article (ABNT):**

SANTOS, Jailda da Silva dos; MADRUGA, Zulma Elizabete de Freitas. Perspectivas decoloniais para o ensino de Matemática: uma reflexão acerca de epistemes silenciadas. **Rev. Pemo**, Fortaleza, v. 8, e16044, 2026. Available at: <https://revistas.uece.br/index.php/revpemo/article/view/16044>

Received on July 30, 2025.

Accepted on December 18, 2025.

Published on March 3, 2026.