DOI: http://dx.doi.org/10.5007/2175-7941.e106729

Between Rivers and Knowledges: Physics Education and Teacher Training from a Decolonial Perspective in the Amazon Region of Pará[+*]

Marlon Fernandes Farias[1]
State University of Pará
Belém – PA
Doctoral Studant in Education – University of São Paulo
São Paulo – SP

Abstract

This article investigates how the decolonial perspective can be integrated into Physics teaching in the Amazon region of Pará, with emphasis on teacher education. The study adopts a qualitative approach, based on a systematic bibliographic review and the analysis of official documents and federal programs related to science education in the region. Academic publications, curricula, and teacher training initiatives were examined, highlighting both the limits imposed by the predominance of Eurocentric epistemologies and the possibilities of dialogue with local knowledge and Amazonian community practices. The findings reveal the absence of systematic studies articulating decoloniality with Physics education in riverside contexts, pointing out gaps and perspectives for further empirical research. It is concluded that valuing epistemic plurality and contextualizing science can strengthen teacher education and contribute to science education guided by cognitive justice.

Keywords: *Physics Education; Decoloniality; Brazilian Amazon; Local Knowledge; Teacher Training.*

[+] Entre Rios e Saberes: Ensino de Física e Formação Docente a partir de uma Perspectiva Decolonial na Amazônia Paraense

[*] *Received: April 26, 2025.*
Accepted: September 18, 2025.

[1] E-mails: marlon.farias@uepa.br; marlon.farias@usp.br

I. Introduction

Physics teaching in Brazilian schools has been predominantly structured based on Eurocentric conceptions of science, detached from the cultural, territorial, and epistemic realities of the subjects that constitute the national educational landscape. In the Amazon region of Pará, this disconnect intensifies given the region's ethnic, linguistic, and ecological plurality. Schools located in riverside, indigenous, and quilombola territories, for example, are permeated by pedagogical practices and curricula that often neglect the local populations' ways of knowing and living. This detachment compromises the link between school knowledge and the students' cultural universe, hindering the learning process and the recognition of science as a situated and historically constructed practice.

In this context, the decolonial perspective constitutes a relevant theoretical-pedagogical key for reconfiguring Physics teaching, as it problematizes the epistemic monoculture imposed by Western modernity and proposes an ecology of knowledges guided by cognitive justice (Santos, 2014). Authors like Quijano (2005) and Mignolo (2020) address the coloniality of knowledge as the persistence of epistemic hierarchies that delegitimize knowledge originating from non-hegemonic contexts. In the educational field, this coloniality manifests itself both in curricula and in teacher training processes, which tend to reproduce the centrality of Euro-American science and silence knowledges produced in peripheral territories and by historically subalternized populations.

The research question guiding this work is: how can the decolonial perspective be integrated into Physics teaching in the Amazon region of Pará? To answer this question, the central objective of this work is to investigate how the decolonial perspective can be integrated into Physics teaching in the Amazon region of Pará, with an emphasis on teacher training, analyzing the challenges and possibilities that open up in this direction.

The research adopts a qualitative approach, based on a systematic bibliographic review and analysis of official curricular documents. It seeks to understand how conceptions of science are constituted in these documents, the epistemological limits of the current curricula, and the possibilities for valuing local knowledges in Science teaching. The analysis is structured around the categories: non-hegemonic epistemologies, decolonial pedagogical practices, and methodological strategies for contextualization.

The results indicate a still marginal presence of epistemologies of the South in Physics documents and curricula, as well as a lack of empirical studies focused on school experiences in Amazonian contexts. However, formative initiatives and pedagogical practices that outline ruptures with the coloniality of knowledge are identified, especially when associated with territorialized and collaborative educational approaches. Thereby, the article contributes to the debate on Science teacher training based on an intercultural, counter-hegemonic, and situated logic, proposing pathways for public policies and pedagogical practices that recognize epistemic diversity as the foundation for a more just, inclusive, and contextualized Physics education.

II. Decoloniality and Education

Decoloniality constitutes a critical response to the coloniality of power, knowledge, and being – concepts formulated by Quijano (2005) to characterize the persistence of colonial structures in contemporary societies. The coloniality of power refers to the imposition of a global hierarchical system that privileges certain ethnic-racial and economic groups. The coloniality of knowledge is associated with the epistemic domination of Western matrix, which subalternizes other forms of knowledge (Mignolo, 2020). The coloniality of being deepens this critique by addressing the existential impacts of colonization on the subjective constitution of individuals (Walsh, 2013). In the educational field, these dimensions operate in an interconnected manner, influencing curricular organization, teacher training, and the recognition of non-Western knowledges.

Eurocentrism in science education manifests itself in the universalization of knowledge, often disregarding the cultural and historical contexts of local populations (Santos, 2014). In Physics teaching, this is expressed in the predominance of exclusively Western theoretical and methodological frameworks, which delegitimize indigenous, riverside, and quilombola epistemologies present in the Amazon. This reductionist approach collaborates with the process of "epistemicide", a term used by Santos (2014) to describe the symbolic elimination of traditional knowledges in favor of a hegemonic science. In contrast, the proposal of an ecology of knowledges seeks to promote dialogue and complementarity between different epistemologies.

The incorporation of decoloniality into educational processes is essential for the promotion of social justice, as it allows for re-signifying teaching based on local realities. As argued by Freire (1967), education should constitute itself as an instrument of liberation, stimulating critical reflection on lived conditions and the transformation of social realities. In the Amazon, this implies recognizing the empirical knowledge of forest populations as an integral part of Physics teaching. For Corrêa et al. (2024), teacher training should adopt a dialogical pedagogy that values vernacular knowledges and encourages community participation in curricular construction. Continuing education, from this perspective, should align with local identities and experiences, promoting pedagogical practices rooted in the sociocultural experiences of school communities.

Education, in this sense, has a primordial function in overcoming coloniality, by fostering cultural and epistemological diversity in the school environment. According to Hage and Araújo Silva (2024), teacher training in the Amazon should be guided by principles of interculturality and emancipatory pedagogies. This is fundamental for educators to integrate different matrices of knowledge – traditional and scientific – into Physics teaching. By breaking with the dichotomy between theory and practice, this approach favors the construction of contextualized and meaningful teaching, expanding the possibilities for pedagogical and scientific innovation in the Amazon territory and contributing to the strengthening of students' cultural identity.

III. Physics Teaching and Decoloniality

The history of Physics teaching is marked by a strong Eurocentric influence, perceptible in the way scientific knowledge is presented and constructed in educational institutions. The dominant narrative emphasizes the contributions of European and American scientists, reinforcing the idea that the development of Physics occurred exclusively in the West. This perspective disregards the role of other civilizations – such as African, Asian, and indigenous – whose traditions and discoveries were equally relevant to the construction of scientific knowledge. According to Quijano (2005), this epistemic supremacy translates into the coloniality of knowledge, a process that marginalizes and subalternizes other ways of knowing. In the Amazonian context, the coloniality of Physics teaching manifests itself in the adoption of decontextualized curricula that do not consider the region's cultural and environmental specificities. As a result, pedagogical practices fail to explore the potential of regional knowledges and the lived experiences of students, limiting the effectiveness of the teaching-learning process (Campos; Menezes, 2009).

The invisibilization of the contributions of other peoples and cultures to the development of Physics is a direct reflection of the coloniality of knowledge and power. According to Guerra and Moura (2022), non-Western civilizations – such as Islamic, Chinese, Indian, and pre-Columbian – made significant advances in areas like optics, mechanics, and astronomy. However, these contributions are often omitted from school curricula, which reinforce a Euro-centered narrative and silence influences from other cultures. This omission perpetuates a distorted view of the history of science, marginalizing epistemic diversity and reducing knowledge to a single cultural matrix.

In the Amazon, for example, the empirical knowledge of indigenous populations about natural phenomena – such as tidal behavior or river navigation – reveals a sophisticated understanding of physical principles, even if not expressed in the formal language of Western science. This is a knowledge built over generations, based on observation and experience, which guides these communities' effective interaction with the environment. The inclusion of these knowledges in Physics teaching could favor more contextualized and meaningful learning, articulating scientific content with local experiences and cultures. This approach values students' trajectories and contributes to a more inclusive and intercultural education (Neves *et al*., 2023).

Despite this, such knowledges are often relegated to the status of "popular knowledge" and are not legitimately incorporated into the formal curriculum. This exclusion impoverishes students' scientific training and reinforces epistemic hierarchies that disqualify traditional knowledges in favor of a homogeneous and hegemonic science.

Overcoming these limitations requires a pedagogical approach that recognizes the diversity of knowledges and the plurality of perspectives in Physics teaching. The incorporation of epistemologies of the South, as proposed by Santos (2014), can favor more inclusive teaching that legitimizes the contributions of historically marginalized populations. In the case of the

Amazon, this implies re-signifying Physics teaching based on the concrete experiences of riverside and indigenous communities, connecting the discipline's concepts to practices such as boat building, sustainable management of natural resources, or traditional systems of spatial orientation (Corrêa *et al*., 2024). This approach expands students' understanding of physical phenomena and strengthens their connection to the territory and their cultural identity.

The construction of a decolonial Physics teaching requires the adoption of pedagogical strategies that promote contextualization, interdisciplinarity, and the valorization of local knowledges. Contextualization allows anchoring content in concrete situations, facilitating learning. Interdisciplinarity, in turn, fosters dialogue between Physics and other areas of knowledge – such as Biology, Geography, and History – enabling a more integrated understanding of natural phenomena. This integration is relevant in the Amazonian context, where knowledges are articulated in an interdependent manner (Hage; Araújo Silva, 2024).

Furthermore, recognizing local knowledges as a legitimate expression of scientific knowledge implies incorporating them into the curriculum in a critical and reflexive manner. Approaches such as Freirean problematization and participatory methodologies can contribute significantly to this process by stimulating student engagement and promoting emancipatory practices (Freire, 1974). In this way, Physics ceases to be perceived as a discipline distant from Amazonian realities and reconfigures itself as an instrument of empowerment and social transformation.

IV. Education in the Amazon Region of Pará

Education in the Amazon region of Pará is situated within a unique context, where cultural, social, and environmental diversity imposes specific challenges and opportunities for constructing pedagogical practices consistent with the local reality. The region is home to a multiplicity of indigenous peoples, riverside communities, and quilombola populations, whose ways of life, forms of social organization, and knowledge systems diverge substantially from hegemonic Western paradigms (Hage; Araújo Silva, 2024). Such diversity demands an educational approach that recognizes and values traditional knowledges, integrating them into the school curriculum in a legitimate and dialogical manner. Furthermore, the region's environmental wealth, with its biodiversity and complex ecosystems, constitutes an invaluable educational potential, enabling contextualized teaching linked to the everyday experiences of local communities (De Sousa; Gomes, 2024).

Despite this cultural and environmental heritage, education in the Amazon faces structural challenges that compromise its access, quality, and relevance. The difficulty of transportation between isolated communities – many accessible only by river – limits both school attendance and student retention in the educational system (Campos; Menezes, 2009). Added to this is the precariousness of school infrastructure, characterized by poorly equipped teaching units, a scarcity of contextualized teaching materials, and a lack of qualified teachers. Teacher training, in turn, still relies on pedagogical models alien to regional specificities,

resulting in the adoption of methodologies that do not dialogue with Amazonian contexts (Corrêa *et al*., 2024). This disconnection between school and territory reinforces processes of exclusion and devaluation of traditional knowledges, hindering the construction of a culturally meaningful education for Amazonian peoples.

Given this scenario, the implementation of an educational model that considers the needs and knowledges of the region's communities becomes imperative. The school cannot act as an instrument of cultural erasure, but rather as a space for strengthening local identities. Decolonial pedagogy, by recognizing epistemological plurality and conferring legitimacy to historically marginalized knowledges, offers a promising path for constructing a more equitable and situated education (Santos, 2014). In the case of the Amazon, this implies including traditional ecological knowledge, indigenous and riverside languages, and the ways of life of local populations in the curriculum, promoting meaningful learning that contributes to valuing students' origins (Neves *et al*., 2023). For this, it is essential to reformulate teacher training processes so that teachers are prepared to act in this complex scenario, incorporating pedagogical practices sensitive to local realities (Rios *et al*., 2024).

The articulation between education, sustainability, and the valorization of local culture constitutes a structuring axis for a truly transformative educational model in the Amazon. The school cannot dissociate itself from the environmental and social issues affecting the region, especially in the face of impacts from deforestation, ecological degradation, and climate change (Freitas; Marques, 2019). Teaching committed to sustainability should empower students to understand the importance of environmental preservation and to develop solutions for the problems faced by their communities. In this context, according to Walsh (2013), the school can function as a space of cultural resistance, promoting activities that encourage the rescue of local traditions, the valorization of traditional agricultural and fishing practices, as well as the strengthening of Amazonian languages and cultural expressions. In this way, education in the Amazon can ensure the right to formal knowledge while simultaneously contributing to social empowerment and the construction of a sustainable future for the region's populations.

V. Teacher Training and Decoloniality

Teacher training constitutes one of the pillars for building a Physics education committed to overcoming the coloniality of knowledge and to valuing the epistemological diversity present in the Amazon. However, such training still occurs, for the most part, under a Eurocentric model, where science is taught from a perspective historically centered on European protagonism and the marginalization of other scientific traditions (Corrêa *et al*., 2024). According to De Sousa and Gomes (2024), the challenges faced by teacher training in the Amazon go beyond the structural limitations of educational institutions, as they also involve the reproduction of the coloniality of power, in which Western scientific knowledge remains as the only legitimate reference for teaching practice. This configuration compromises the construction of an education that dialogues with the realities and needs of local communities,

perpetuating the disconnection between Physics teaching and the sociocultural experiences of students.

One of the main obstacles to teacher training from a decolonial perspective lies in the curricula of Physics degree programs. According to Freitas and Marques (2019), the curricular structures of Amazonian universities are still based on models imported from institutions in the South and Southeast of Brazil, often disregarding regional specificities. As a consequence, future teachers are trained for a pedagogical practice that barely dialogues with the reality experienced by indigenous, riverside, and quilombola students. Furthermore, Abib (2010) observes that evaluation processes in Physics teaching tend to follow quantitative and standardized models, neglecting the need for formative approaches that consider local contexts. This gap reinforces a reductionist view of learning, where students are evaluated based on academic performance detached from their sociocultural reality.

Faced with these limitations, the adoption of formative strategies that promote the deconstruction of the colonial logics of knowledge and power becomes essential. For Mignolo (2020), the valorization of plural epistemologies is one of the possible paths for such transformation, recognizing science – and Physics in particular – as a field of knowledge in permanent dialogue with different cultures. In the Amazonian context, this implies incorporating the traditional knowledges of local populations into teaching, building bridges between Western science and the ecological, astronomical, and technological knowledge developed by indigenous and riverside peoples over generations. Neves *et al*. (2023) argue that by neglecting these contributions, education perpetuates the invisibilization of other forms of knowledge and hinders students' engagement with school content, as they do not recognize themselves in these knowledges.

Another central aspect in the training of decolonial teachers is the creation of collaborative learning spaces, where teachers can share experiences and collectively construct new pedagogical approaches. Hage and Araújo Silva (2024) highlight that degree programs in Rural Education have shown the value of this formative proposal, as they enable pre-service teachers' direct contact with communities, favoring teaching practices that dialogue with local realities. This perspective is reinforced by Rios *et al*. (2024), who advocate for the adoption of methodologies based on critical multiliteracies, which allow teachers to appropriate innovative and contextualized pedagogical strategies.

Furthermore, it is imperative to recognize the knowledges and experiences of teachers already working in the Amazon, valuing them as protagonists in the construction of a decolonial education. Campos and Menezes (2009) point out that many teachers in the region develop creative pedagogical practices based on their experiences and knowledge built over the years. However, such experiences are often disregarded by traditional training models. To reverse this situation, it is necessary to invest in continuing education policies that consider Amazonian specificities, promoting exchange between the university and local schools. Thus, it will be

possible to build a Physics education that, in addition to promoting scientific learning, strengthens the cultural identity and autonomy of Amazonian communities.

VI. Curricular Guidelines and Official Documents Guiding Conceptions of Science in Teacher Training in the Amazon Region of Pará

Teacher training in the Amazon region of Pará is traversed by a set of official documents that, while seeking to align with national guidelines, also attempt to recognize the region's sociocultural and environmental uniqueness. In this context, the conceptions of science that guide formative processes reveal tensions between hegemonic paradigms, of Euro-centered matrix, and counter-hegemonic perspectives that aim to legitimize local knowledges and Amazonian sociocultural practices. Documents such as the Pará State Curricular Document (DCEPA), the National Common Curricular Base (BNCC), and federal teacher training programs like the National Plan for Basic Education Teacher Training (Parfor), the Institutional Scholarship Program for Teaching Initiation (Pibid), and the Pedagogical Residency constitute normative references that guide both initial and continuing teacher training in the region.

The DCEPA plays a decisive role by seeking to articulate the principles of the BNCC with the specificities of Pará. Although subordinate to the logic of curricular standardization imposed by the national document, the DCEPA recognizes the importance of a curriculum that respects the cultural diversity of the Amazon, values the ways of life of riverside, indigenous, and quilombola peoples, and promotes education aimed at sustainability in its multiple dimensions. This guideline contributes to the construction of a conception of science that, besides being understood as an accumulation of universal content, is also conceived as a situated, relational, and historical practice, committed to social transformation and the recognition of local epistemologies (Pará, 2021).

Although it has a prescriptive character and has been the target of criticism for its tendency towards curricular uniformity, the BNCC includes, among its general competencies, elements that can be mobilized towards decolonial practices in Science teaching. Among these elements, the valorization of cultural diversity, the contextualization of knowledges, and the stimulation of critical and creative thinking stand out (Brasil, 2018). However, the absence of explicit guidelines on the insertion of epistemologies of the South (Santos, 2014) or traditional knowledges into curricula (Mignolo, 2012) represents a challenge to their effective incorporation in Amazonian school contexts. It should be clarified that Santos (2014) and Mignolo (2012) do not specifically address Amazonian school contexts, but they offer fundamental theoretical references for understanding the coloniality of knowledge and the epistemic alternatives that underpin this analysis. Thus, these contributions are mobilized here as a conceptual key to interpret the curricula and official documents of the Amazon region of Pará, in dialogue with local productions (Corrêa *et al*., 2024; Hage; Araújo Silva, 2024; Neves *et al*., 2023) that directly discuss the region's specificities.

In the field of teacher training, programs like Parfor, Pibid, and the Pedagogical Residency have established themselves as important instruments for articulation between university and school. Despite their potential, studies indicate that these programs face difficulties regarding curricular and methodological adaptation to the sociocultural realities of the Amazon. Frequently, the proposed content and pedagogical practices remain anchored in decontextualized conceptions of science, disregarding the ways of knowing, living, and teaching of local populations (Araújo, 2023; Johann, 2023; Cardoso; Nunes, 2017).

From an epistemological perspective, the analyzed documents point to a still incipient but growing valorization of the epistemology of praxis – a conception of science that emerges from concrete experience, is built in dialogue with subjects, and is oriented towards the critical transformation of reality. This approach challenges the supposed neutrality of modern science and calls on teachers in training to act as collaborators/facilitators/cultural mediators, articulating scientific knowledges with traditional, environmental, and territorial knowledge (Freire, 1996; Santos, 2014).

Furthermore, the official guidelines reiterate interdisciplinarity as an essential methodological strategy for teaching in the Amazon, due to the complexity of the natural and social phenomena that characterize the territory. Understanding themes such as tides, ecological cycles, fishing, agriculture, and biodiversity requires an integration between different fields of knowledge, challenging disciplinary fragmentation and promoting pedagogical approaches that make sense in students' daily lives.

Thus, although curricular documents and training policies present limitations stemming from their legal and structural frameworks, they also offer openings for the construction of more critical, situated, and decolonial teaching practices. When committed to cognitive justice and the valorization of local knowledges, Science teacher training in the Amazon region of Pará can configure itself as a political-pedagogical act of resistance to the coloniality of knowledge, contributing to a science education rooted in Amazonian realities and aimed at the emancipation of subjects.

VII. Methodological Approach: Content Analysis

This research adopts a qualitative approach (Denzin; Lincoln, 2006), based on a systematic bibliographic review and documentary analysis of curricular guidelines and teacher training programs. The choice of this methodology is justified by the need to understand how the decolonial perspective articulates with Physics teaching in the Amazon region of Pará, allowing for the identification of both the permanence of coloniality and the possibilities of rupture.

The bibliographic review was conducted in databases such as SciELO, Google Scholar, and ResearchGate, between 2020 and 2025. Combinations of keywords in Portuguese and English were used, such as: *"ensino de Física AND decolonialidade", "ciência AND*

Amazônia AND educação", "formação de professores AND epistemologias do Sul", "Physics education AND decoloniality".

After applying the inclusion criteria – thematic relevance, peer review, and linkage with science education – and the exclusion criteria – duplicate works or those without a direct relationship with Science/Physics teaching or with decoloniality – the documentary corpus of this research consists of 27 works, distributed as 12 scientific articles, 8 books and book chapters, 1 master's thesis, and 6 official documents.

This selection encompasses a diversity of sources that address central themes such as teacher training, science education, educational public policies, traditional knowledges, and decolonial perspectives, with an emphasis on the Amazonian context. The presence of classic authors like Paulo Freire and contemporary theorists such as Walter Mignolo and Boaventura de Sousa Santos, coupled with regional academic productions and institutional regulations, allows for a critical and interdisciplinary analysis, articulating theoretical foundations, pedagogical practices, and educational policies aimed at valuing the territories and epistemologies of the Global South. This systematization ensures greater transparency in the selection process and assures the analytical consistency of the investigation.

In order to value scientific production situated in the territory, journals from the Northern region were prioritized, such as Science Education Journals, for example the Revista Cocar (UEPA), as well as publications from UFPA, UFAM, and UEA. This choice sought to ensure regional representativeness and reinforce the relevance of analyzing academic debates from Amazonian specificities, avoiding the exclusive centrality of productions from the South-Southeast axis.

The documentary analysis focused on two axes: (i) normative documents (BNCC, DCEPA, ordinances and regulations of Parfor, Pibid, and Pedagogical Residency) and (ii) academic productions on training policies (Cardoso; Nunes, 2017; Johann; Lima, 2023). In the case of federal programs, both official documents (MEC and CAPES Ordinances) and studies evaluating their implementation in Amazonian universities were examined, allowing for an understanding of how these initiatives dialogue with local realities.

For the analysis, Bardin's (2011) content analysis method was adopted, structured in three stages: (i) pre-analysis, with organization of the corpus and definition of recording units; (ii) material exploration, where data were coded and grouped into thematic categories; and (iii) treatment and interpretation, in light of the decolonial perspective. During the exploration stage, significant statements revealing the conception of science and curriculum were extracted.

The BNCC (2018), for example, reiterates the determination of the Law of Guidelines and Bases of National Education (LDB), from 1996, by stating that *"the curricula of Early Childhood Education, Elementary Education, and High School must have a common national base, to be complemented […] by a diversified part, required by the regional and local characteristics of society, culture, economy, and students"* (Brasil, 1996 apud Brasil, 2018, p.

28). This excerpt was categorized as evidence of the tension between national standardization and the valorization of regional diversity.

Similarly, the Pará State Curricular Document (DCEPA, 2021) establishes that school education should be organized in a way that considers Amazonian realities, promoting pedagogical practices that value the knowledges of traditional communities and the socio-environmental specificities of the region (Pará, 2021, p. 18, 43, 61, 190, 259, 263, 322). This statement was classified as an indicator of openness to decoloniality, given that the document itself explicitly states the need to *"decolonize the Pará curriculum"* and to *"envision new analytical tools that can found new logics and rationalities in this process of interculturalizing, plurinationalizing, and decolonizing"* (PARÁ, 2021, p. 61, 63-64), in addition to assuming a stance of autonomous construction in relation to national policy (Pará, 2021, p. 37), albeit circumscribed at the normative level.

The analysis categories emerged from both the academic texts and the official documents, organized into three axes: (i) presence (or absence) of non-hegemonic epistemologies in Physics curricula; (ii) challenges in implementing decolonial pedagogical practices; and (iii) methodological strategies for valuing local knowledges.

To ensure the validity and consistency of the results, source triangulation was employed, contrasting academic productions, official documents, and training programs. This procedure strengthens the reliability of the inferences and enables a critical understanding of the conditions for inserting the decolonial perspective into Physics teaching. Thus, the methodology organizes the empirical corpus and enables a situated analysis, allowing for the articulation of the global theoretical references of decoloniality with Amazonian educational specificities.

VIII. Results and Discussion

VIII.1 Overview of academic productions on Physics teaching and decoloniality in the Amazon

The mapping of academic productions on Physics teaching and decoloniality in the Amazon reveals an emerging field, still in the process of consolidation. Based on the systematic analysis of articles, dissertations, and theses available in databases like SciELO, Google Scholar, and journals from universities in the Northern region, it is observed that most studies focus on general approaches to decolonial education, with an emphasis on rural education, intercultural pedagogies, or school experiences with indigenous and quilombola populations. However, there is a scarcity of research that specifically addresses Physics teaching from a decolonial perspective situated in the Amazonian reality. This gap highlights the persistent marginalization of this discipline in the debate on contextualized pedagogical practices, despite its potential to problematize the relationship between science, culture, and territory.

The most recurrent theoretical approaches in the analyzed productions are anchored in the works of authors such as Aníbal Quijano, Walter Mignolo, and Boaventura de Sousa Santos. Quijano (2005) provides the conceptual framework of the "coloniality of knowledge", fundamental for understanding how science teaching, including Physics, has historically operated under an exclusionary and hierarchical logic. Mignolo (2020) contributes with the notion of "border thinking" and the critique of imperial epistemology, which allows for questioning the epistemic authority attributed to Western science in schools. Santos (2014) proposes the "ecology of knowledges" as an alternative to the monoculture of modern scientific knowledge, emphasizing the need to articulate academic and popular knowledges in a horizontal manner. These references are used to propose forms of teaching that break with the unidirectional logic of content transmission and that recognize students as subjects of valid and situated knowledges.

Even in the face of important theoretical advances, academic production is still timid regarding the systematization of pedagogical experiences in Physics in riverside contexts and schools in the interior of the Amazon. Most empirical studies focus on the analysis of public policies or on specific reports of school experiences, without methodologically deepening the impacts of decolonial proposals on Physics teaching. The absence of more robust studies in this field is not only a symptom of disciplinary disinterest but also a reflection of the historical invisibilization of the Amazon in curricular and scientific debates. As highlighted by Santos (2014), modern science has operated, throughout its history, through "epistemicides", eliminating or subalternizing forms of knowledge that did not correspond to the dominant rationality. In the case of the Amazon, this elimination is accompanied by a geographical silencing, where the territory and its people are reduced to the condition of objects of study and not as knowledge-producing subjects.

Therefore, the current panorama indicates the urgency of expanding studies that articulate Physics teaching, decoloniality, and the Amazon, whether through empirical investigations that reveal teachers' practices in Amazonian territories, or through the theoretical deepening of the pedagogical implications of the ecology of knowledges in science teaching. Such a movement is necessary for school Physics to cease reproducing a colonial epistemology and transform itself into a field of critical formation, rooted in the territories and historical experiences of its subjects.

VIII.2 Conceptions of science in official curricular guidance documents

The analysis of the official documents guiding teacher training and Physics teaching in the Amazon region of Pará reveals a tension between different conceptions of science. On one hand, there is a predominance of a traditional and universalizing perspective of science, centered on technical-experimental rationality and the objectivity of scientific methods; on the other, attempts to incorporate more critical, contextualized, and integrative conceptions emerge, aligned with the valorization of the region's cultural and epistemic diversity.

The Pará State Curricular Document (DCEPA, 2021) emphasizes that school education should be organized in a way that considers Amazonian realities, promoting pedagogical practices that value the knowledges of traditional communities and the socio-environmental specificities of the region (Pará, 2021, p. 15, 43, 250, 397). The document itself categorizes this approach as an indicator of openness to decoloniality, by stating the need to "decolonize the Pará curriculum" and "envision new analytical tools that can found new logics and rationalities in this process of interculturalizing, plurinationalizing, and decolonizing" (Pará, 2021, p. 61, 398). This perspective reinforces the possibility of dialogue between epistemologies of the South (Santos, 2014) and formal Science teaching, as expressed in the "valorization of different knowledges and subjects, be they riverside, quilombola, indigenous, or urban, so that they understand that knowing the functioning of part of science does not mean abandoning other local knowledges" (Pará, 2021, p. 250, 642). This guideline suggests an opening for overcoming modern scientific hegemony, even though, in practice, structural and epistemic challenges remain that hinder its effective implementation.

Similarly, the National Common Curricular Base (BNCC), although not specific to the Amazon region, also strongly influences local curricula and teacher training programs. It proposes competencies such as scientific, critical, and creative thinking, as well as the valorization of sociocultural diversity (Brasil, 2018). The BNCC (2018), for example, states that "the curricula of Early Childhood Education, Elementary Education, and High School must have a common national base, to be complemented […] by a diversified part, required by the regional and local characteristics of society, culture, economy, and students" (Brasil, 1996, *apud* Brasil, 2018, p. 28). This excerpt highlights the tension between national standardization and the valorization of regional particularities, a central aspect for thinking about the insertion of Amazonian knowledges into Physics teaching.

However, this valorization of diversity appears in a generic form and disconnected from a coherent epistemological project. While stimulating the contextualization of knowledge, the BNCC maintains a fragmented curricular structure oriented towards classical and Euro-centered content, especially in the Natural Sciences areas. Thus, even while recognizing the importance of the plurality of knowledges, the national documents make little progress towards a situated science that recognizes epistemologies of the South as legitimate and formative.

In the analyzed documents, the presence of the so-called epistemology of praxis is also identified, mainly in training programs like Parfor and the Pedagogical Residency. These programs, when adapted to regional realities, seek to bring theory and practice closer, promoting a Science teaching that takes into account the concrete experience of the subjects and the contradictions of the territory (Araújo, 2023).

Regarding Parfor, the project is aimed at "teaching professionals who are currently practicing in the public basic education network" (Brasil, 2017, art. 2º), indicating that the courses are designed for those who already possess classroom experience.

The responsibilities of the general and assistant coordinators reinforce this perspective, stipulating that they must: "Coordinate, promote, and monitor academic and pedagogical activities, as well as carry out, together with course coordinators, the adaptation of the pedagogical project to the specificities of the students selected for special classes" (Brasil, 2017, art. 52, I, b). This "adaptation of the pedagogical project to the specificities of the students," where the students are practicing teachers, suggests an implicit recognition of practical teaching experience as a relevant starting point for knowledge construction within the program, aiming for training that directly addresses their needs and contexts of practice.

It is noteworthy that the program seeks to promote reflective teacher training, based on the articulation between theory and practice, valuing the teachers' experience in school and problematizing the school reality to generate new knowledge and combat decontextualized pedagogical practices. Despite structural difficulties, Parfor guides participants to critically reflect on their practice, promoting a school that thinks about its mission collectively and in a theoretically grounded manner.

Regarding Pibid, the program also seeks to "contribute to the articulation between theory and practice necessary for teacher training, enhancing the quality of academic actions in licentiate degree courses" (Brasil, 2016, art. 4º, VI). The insertion of licentiate students into the school environment is central, as the program aims to "insert licentiate students into the daily life of public education schools, providing them with opportunities to create and participate in methodological, technological, and teaching experiences of an innovative and interdisciplinary nature" (Brasil, 2016, art. 4º, IV).

The valorization of local knowledges is promoted through the "comparison of the analysis of didactic-pedagogical cases with the practice and experience of basic education school teachers, with their knowledges about the school and about the didactic mediation of contents" (Brasil, 2016, art. 6º, VII). Projects must involve the "study of the educational context involving actions in different school spaces", which ensures the training is sensitive to the reality of the schools (Brasil 2016, art. 6º, I). The "elaboration of actions in the school space based on the dialogue and articulation of program members and between them and the community" is encouraged, promoting integration and the contextualization of teacher training (Brasil, 2016, art. 6º, IX).

Parfor must also contemplate "the educational context of the region where it will be developed" and include "a description of the educational context of the region where the institutional project will be developed", ensuring the local relevance of activities (Brasil, 2016, art. 7º, IV; Annex III, item 4.11, a, I). The pedagogical proposals of the subprojects must demonstrate "how it will articulate [...] with the pedagogical project of the schools", reinforcing integration with existing school practices and planning (Brasil, 2016, art. 7º, Annex III, item 4.11, c, I). To strengthen the joint construction of knowledge, basic education systems must "articulate with the Higher Education Institutions (IES) to enable the development of the project

and the creation of study and research groups formed by teachers from the Basic Education System" (Brasil, 2016, art. 22, I).

Supervisors, who are basic education teachers, have the duty to "integrate into the research groups of the IES and promote the formation of study groups in the school or school system, aiming to enhance the production of knowledge about teaching and learning in Basic Education" (Brasil, 2016, art. 37, XII).

Attention to diversity is a principle, with projects having to address "socio-environmental, ethical issues and diversity as principles of social equity, which should transversally permeate all subprojects" (Brasil, 2016, art. 7º, VII). The institutional coordinator must "promote meetings and encounters among scholarship holders, ensuring the participation of all, including principals and other teachers from public schools and representatives of education departments, when appropriate", facilitating the exchange of experiences and collaboration (Brasil, 2016, art. 35, XIV).

Project methodology must include the "planning and execution of activities [...] that expand opportunities for knowledge construction in formative spaces," stimulating continuous and collaborative learning (Brasil, 2016, art. 6º, III). The program aims to "contribute so that licentiate students insert themselves into the school culture of teaching, through the appropriation and reflection on instruments, knowledges, and peculiarities of teaching work" (Brasil, 2016, art. 4º, VII). Finally, PIBID contributes to the "creation or strengthening of groups of researchers that enhance teacher training at the IES, educational research, and articulation with school systems", fostering the production and dissemination of knowledge (Brasil, 2016, Annex III, item 4.11, a, V, iv).

In this context, there are possibilities for collaborative practices and valorization of local knowledges, through activities that bring together licentiate students, school teachers, and the community, favoring contextualized teacher training. Furthermore, the program fosters interaction among licentiate students, teachers, and coordinators, strengthening the joint construction of knowledge and contributing to teacher training that is more contextualized and attentive to diversities.

Regarding the Pedagogical Residency, the Program aims to "foster innovative projects that stimulate the articulation between theory and practice in licentiate degree courses" (Brasil, 2018, p. 59, 1.1) and has as one of its objectives "To perfect the training of licentiate degree students, through the development of projects that strengthen the field of practice and lead the licentiate student to actively exercise the relationship between theory and professional teaching practice" (Brasil, 2018, p. 3, 2.1, I). The Pedagogical Residency consists of the "planned and systematic immersion of the licentiate student in a school environment aiming at the experience and experimentation of concrete situations of school and classroom daily life which will later serve as an object of reflection on the articulation between theory and practice" (Brasil, 2018, p. 64, 3.1).

The program establishes a co-responsibility between IES, school networks, and public schools, being “carried out under a collaboration regime” formalized by a “Technical Cooperation Agreement (TCA) signed between the Federal Government, through Capes; the National Council of Education Secretaries (Consed) and the National Union of Municipal Education Leaders (Undime)”. The participation of States, the Federal District, and Municipalities is formalized by a “Term of Adhesion to the TCA” (Brasil, 2018, p. 7, 2.3.1). Furthermore, one of the objectives is to “Strengthen, expand, and consolidate the relationship between the IES and the school, promoting synergy between the entity that trains and the one that receives the licentiate graduate and stimulating the protagonism of school networks in teacher training” (Brasil, 2018, p. 4, 2.1, III). The Institutional Project must be “coordinated and executed in an organic and interactive manner with the school networks, articulating the subprojects with the pedagogical projects of the IES’s licentiate degree courses and the partner schools” (Brasil, 2018, p. 31, 9.4), and must be “elaborated and organized based on a prior and subsequent study on the expectations and needs of the school networks” (Brasil, 2018, p. 60, 1.1, b).

The immersion of the licentiate student in the school daily life is a pillar of the program, which defines the pedagogical residency as a “training activity [...] developed in a public basic education school, called a partner school”, with “320 hours of immersion, 100 of which are for teaching practice” (Brasil, 2018, p. 5, 2.2.1.1). The resident should be led to “seek knowledge of the context and culture of the school, of the interrelationships of the school social space” (Brasil, 2018, p. 67, 3.1.2, c)].

Regarding the promotion of collaborative research and academic production, the program encourages the “development of projects that strengthen the field of practice [...] using data collection and diagnosis on school teaching and learning” (Brasil, 2018, p. 3, 2.1, I). Activities include the elaboration of reports, research instruments, scripts, and other activities arising from the resident's experience. Additionally, the program provides to “Guide and maintain groups of residents to share experiences with non-resident students, aiming to create a collaborative learning network in the IES's licentiate degree courses” (Brasil, 2018, p. 70, 3.1.2, h).

However, the Pedagogical Residency does not contain explicit or direct indications that it aims to promote a decolonial perspective in education, value traditional knowledges, generate ruptures in the colonial logic of science teaching, or foster an anti-racist and critical education in the terms described in the second part of your statement. The Program primarily addresses the improvement of teacher training and the theory-practice articulation, with references to the National Common Curricular Base (BNCC) (Brasil, 2018, p. 4, 2.1, IV; 71, 3.1.4, a, b, c). Although courses such as “Intercultural Indigenous Licentiate Degree and Rural Education Licentiate Degree” may integrate the projects (Brasil, 2018, p. 9, 4.2), the general regulations of the Edict do not detail how these specificities would be approached in relation to themes of decoloniality or anti-racist education.

This analysis shows that, despite the structural limitations of the programs, the action of teachers and researchers committed to decolonial education can generate important ruptures in the colonial logic of science teaching. This perspective, although still a minority, proposes a less neutral and more socially transformative science, in tune with the propositions of Santos (2014), who defends an ecology of knowledges as an alternative to the epistemicide caused by Western modernity. According to the author, it is necessary to overcome the monoculture of science and institute dialogued and horizontalized forms of knowledge, especially in contexts like the Amazon, where traditional knowledges remain alive and productive (Santos, 2014).

Despite these normative advances, the analysis reveals that the documents still do not break with the logic of the coloniality of knowledge. The prevailing conception of science remains linked to instrumental rationality and the model of European science, to the detriment of other forms of understanding the world. The space reserved for indigenous, quilombola, and riverside epistemologies is peripheral, usually presented as a complement and not as an alternative foundation.

The challenge, therefore, is to transform this marginal presence into a structuring element of curricular policies, promoting teacher training that recognizes and legitimizes the science produced in the territories, in articulation with Amazonian ways of life.

VIII.3 Presence (or absence) of non-hegemonic epistemologies in Physics curricula

The analysis of curricula and pedagogical proposals aimed at Physics teaching in the Amazon region of Pará evidences the predominance of a Euro-centered epistemological matrix, with low insertion of non-hegemonic perspectives. The current curricular structure, especially in the teaching materials and lesson plans used in licentiate degree courses, still reproduces a historical linearity of science marked by European foundational milestones – such as the theories of Galileo, Newton, Maxwell, and Einstein – to the detriment of other scientific traditions and alternative ways of knowing. This predominance silences local epistemologies and disarticulates any possibility for the Amazonian student to recognize themselves as a legitimate subject of school science, which compromises the construction of bonds with the discipline and with the educational process as a whole.

Despite recent guidelines, such as the Pará State Curricular Document (Pará, 2021), pointing towards the valorization of epistemic diversity and respect for traditional knowledges, indigenous, quilombola, and riverside epistemologies remain absent or scarcely explored in Physics curricular content. When mentioned, these knowledges appear in an accessory manner, often without the due status of valid knowledge, being presented as cultural curiosity or as a complementary illustration to a “central” content that continues to be that of modern Western science. This form of peripheral insertion reveals what Boaventura de Sousa Santos (2014) calls “subordinate inclusion”, where traditional knowledge is tolerated but not recognized as an autonomous producer of knowledge (Santos, 2014).

Furthermore, there is an absence of systematic institutional initiatives that articulate Physics curricula with the epistemologies of the Amazonian territory. The presence of ancestral knowledges – such as the observation of the lunar cycle and tides for fishing, the use of acoustic knowledge in long-distance communication, or constructive practices involving thermodynamics and thermal insulation – could offer starting points for addressing Physics concepts in a situated and critical manner. However, these elements are rarely mobilized in the curricula and, when they are, they do not receive due epistemological treatment, remaining as empirical data disconnected from the conceptual structures of the discipline.

This absence is a symptom of a persistent curricular coloniality, which manifests itself in the content and the way scientific knowledge is constructed: through transmissive methodologies, exclusionary technical language, and evaluation based on the memorization of abstract formulas. Decolonial thinking, by proposing the recognition of epistemic borders (Mignolo, 2020), invites the reformulation of these curricula based on an effective dialogue between different forms of knowledge, breaking with the hierarchy that positions modern science as the only valid reference. In the Amazonian context, this reformulation is even more urgent, given the richness of ecological, technological, and cosmological knowledges present in local ways of life, which can – and should – be mobilized as a constitutive part of a plural, contextualized, and intellectually just school Physics.

VIII.4 Challenges in implementing decolonial pedagogical practices

The effective implementation of decolonial pedagogical practices in Physics teaching in the Amazon region of Pará encounters various obstacles, ranging from structural impediments to epistemological and formative resistances. Although there are curricular guidelines that recognize the importance of valuing local knowledges, contextualizing teaching, and interdisciplinarity – as expressed by the DCEPA (2021) and, to a lesser extent, the BNCC (2018) – the translation of these principles into concrete actions faces a series of difficulties in school contexts. Teaching practices remain largely subordinated to traditional teaching models, with a strong emphasis on content reproduction and the validation of a single form of knowledge: modern Western science. This hegemony manifests itself both in the organization of curricula and in the choice of methodologies and teaching materials.

One of the main challenges is the initial training of Physics teachers. As shown by De Sousa and Gomes (2024), licentiate degree courses in the region still operate mostly under a content-based logic, centered on classical science and teaching methods that barely dialogue with the sociocultural realities of the Amazon. Many future teachers are trained without epistemological references that value traditional knowledges or that stimulate the problematization of the relationships between science, power, and territory. Furthermore, there is a lack of disciplines that address the coloniality of knowledge as an analytical category and that encourage the construction of localized pedagogical projects. This absence compromises

teachers' ability to develop teaching practices that articulate Physics with students' experiences and with riverside, quilombola, and indigenous ways of life.

Another important obstacle refers to school infrastructure and the availability of adequate teaching materials. In many Amazonian communities, Physics teaching is hampered by the lack of laboratories, basic equipment, and internet access. This reality hinders the realization of experimental activities and the creation of pedagogical contexts that value local knowledges, especially when the available material is produced outside the region and lacks connection with local territories and cultures. As pointed out by Campos and Menezes (2009), this disconnection between school content and students' social practices contributes to the devaluation of the discipline and students' distancing from scientific learning.

Institutional resistance to curricular change also represents a recurring challenge. School culture often naturalizes the authority of Eurocentric scientific knowledge and delegitimizes any attempt to include popular or ancestral knowledges as a legitimate part of the curriculum. This resistance is reinforced by normative evaluative mechanisms, which pressure teachers to follow national performance standards to the detriment of critical and contextualized approaches. Rios **et al.** (2024) argue that the adoption of decolonial pedagogies requires deep ruptures in the ways of teaching, evaluating, and conceiving the role of the school, which implies facing not only pedagogical issues but also political and ideological disputes within educational institutions.

Faced with these challenges, it becomes necessary to invest in continuing teacher training with a decolonial focus, create collaboration networks between schools and communities, and promote public policies that ensure the presence of Amazonian epistemologies in teaching materials and pedagogical projects. Without this commitment, Physics teaching in the region will continue to reproduce an exclusionary logic detached from the knowledges and needs of Amazonian peoples.

VIII.5 Methodological strategies for valuing local knowledges

Valuing local knowledges in Physics teaching demands the development of methodological strategies that break with the transmissive logic of knowledge and promote dialogue between different epistemologies. In the Amazonian context, where ways of life are deeply intertwined with nature's cycles, water flows, orality, and community memory, pedagogical practices that start from active listening and situated observation can constitute effective paths for bringing scientific content closer to students' lived experience. In this sense, inquiry-based methodologies and integrative projects emerge as potent alternatives for concretizing a decolonial pedagogical practice. By proposing that the student acts as a researcher of their own territory, these strategies enable the articulation between Physics concepts and the natural and technological phenomena that are part of the riverside, indigenous, or quilombola daily life.

Among the practices documented in recent academic productions, pedagogical projects that address, for example, the study of motion from the analysis of the displacement of traditional boats on rivers, the exploration of optics from sensory experiences with light and colors in the forest, or the teaching of thermodynamics based on food preservation strategies used by local communities stand out. Such examples demonstrate that it is possible to construct a Physics teaching that starts from the materiality of Amazonian life without relinquishing conceptual rigor, but shifting the starting point of knowledge to the historically invisibilized knowledges. For this, it is fundamental that teachers are stimulated to elaborate didactic sequences open to the investigation of the sociocultural and environmental contexts in which the school is inserted.

Interdisciplinarity also constitutes an essential methodological axis in this process. By integrating knowledge from different areas – such as Geography, Biology, History, and Portuguese Language – Physics teaching can be re-signified through the construction of generative themes and thematic units that reflect the real problems faced by communities. This proposal harks back to Paulo Freire's (1974) problem-posing pedagogy, in which knowledge is constructed from the critical reading of the world and the educand's reality. In the Amazonian context, interdisciplinarity gains strength not only as a pedagogical strategy but above all as an epistemological requirement of a region that is not compartmentalized but organizes itself from the complexity and interdependence of natural and human phenomena.

Another relevant aspect is the involvement of the community in the educational process. Workshops with local masters, conversation circles with community elders, and technical visits to non-school knowledge spaces – such as flour houses, boat shipyards, fishing outposts, or collective farms – allow students contact with practices that involve physical principles not yet translated into school scientific language. This recognition of the community as a legitimate space of knowledge production contributes to deconstructing the hierarchy between school knowledge and traditional knowledges. As argued by Corrêa et al. (2024), valuing the experiences of subjects and their ways of knowing is a fundamental step towards teacher training committed to cognitive justice and the transformation of Science teaching.

Finally, it is necessary that these strategies are supported by an expanded conception of curriculum, which allows for flexibility, listening, and experimentation. A decolonial curriculum cannot be tied to fixed scripts and unified evaluative standards; on the contrary, it must open space for collective creation, for doubt, and for the incompleteness of knowledge, recognizing that science is always a process in dispute. By incorporating local knowledges as a starting point and not as an addendum, Physics teaching in the Amazon can reconfigure itself as a living practice, rooted in the territory and committed to the subjects who inhabit it.

IX. Final Considerations

The problem that guided this study consisted of understanding how the decolonial perspective can be integrated into Physics teaching in the Amazon region of Pará, with an

emphasis on teacher training. To answer it, the objective was to analyze the challenges and possibilities of this integration in light of official documents, academic productions, and formative experiences in the region.

The originality of this investigation lies in highlighting the lack of studies that articulate decoloniality specifically with Physics teaching in Amazonian riverside contexts. While much of the literature addresses the topic broadly, focused on education or the humanities in general, this work delimits itself to a particular field – Physics teaching – and situates it in a reality marked by its own sociocultural, environmental, and historical challenges.

The analysis showed that Physics curricula and practices remain predominantly guided by Eurocentric epistemologies, which tend to marginalize Amazonian knowledges. At the same time, initiatives that seek to bring science and territory closer were identified, especially through contextualization, interdisciplinarity, and the recognition of traditional knowledge as a legitimate part of the educational process.

The results also evidence the centrality of teacher training for the advancement of decolonial proposals but point to the scarcity of empirical research in Amazonian contexts as a limitation, especially those that document classroom practices and community experiences. This aspect reinforces the need for new studies capable of consolidating more situated theoretical and methodological frameworks.

Thus, the article contributes to filling a gap by proposing systematized reflections on how school Physics can dialogue with local knowledges and community practices of the Amazon, expanding the understanding of science not only as a universal body of concepts but as a process permeated by cultures, territories, and power relations. This approach paves the way for science teacher training to become more critical, plural, and contextualized, favoring the strengthening of Amazonian identities and a science education guided by cognitive justice.

References

ABIB, M. L. V. S. Avaliação e melhoria do ensino de física. In: CARVALHO, A. M. P. (Coord.) CARVALHO, A. M. P. **Ensino de Física** - Col. Ideias em Ação. 1. ed. São Paulo: Cengage Learning, 2010. v. 1. 158p.

ARAÚJO, A. P. **Um processo formativo colaborativo de formação continuada de professores de ciências da natureza na Amazônia Paraense:** tecendo diálogos sob aspectos socioemocionais e culturais para uma boa docência. 2023. Dissertação (Mestrado) - Universidade do Estado do Pará, Programa de Pós-Graduação em Educação em Ciências e Matemáticas. Disponível em: https://paginas.uepa.br/ppgeeca/wp-content/uploads/2023/03/Texto-de-Dissertacao-Ana-Paula-Araujo-Final.pdf. Acesso em: 20 abr. 2025.

BRASIL. **Base Nacional Comum Curricular**. Brasília: MEC, 2018. Disponível em: https://basenacionalcomum.mec.gov.br/. Acesso em: 20 abr. 2025.

BRASIL. Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). **Edital Capes nº 06/2018**: Programa de Residência Pedagógica. Retificado. Brasília, DF, 2018. Disponível em: https://www.gov.br/capes/pt-br/centrais-de-conteudo/27032018-edital-6-residencia-pedagogica-alteracao-ii-pdf. Acesso em: 20 abr. 2025.

BRASIL. Ministério da Educação. **Portaria nº 46, de 11 de abril de 2016**. Regulamento do Programa Institucional de Bolsa de Iniciação à Docência (Pibid). Diário Oficial da União, Brasília, DF, 12 abr. 2016. Disponível em: https://www.gov.br/capes/pt-br/centrais-de-conteudo/15042016-portaria-46-regulamento-pibid-completa-pdf. Acesso em: 20 abr. 2025.

BRASIL. Ministério da Educação. **Portaria nº 82, de 17 de abril de 2017**. Regulamento do Programa Nacional de Formação de Professores da Educação Básica (Parfor). Diário Oficial da União, Brasília, DF, 18 abr. 2017. Disponível em: https://www.gov.br/capes/pt-br/centrais-de-conteudo/24082017-portaria-82-2017-regulamento-parfor-pdf. Acesso em: 20 abr. 2025.

CAMPOS, E. S.; MENEZES, A. P. S. **Práticas avaliativas no ensino de Física na Amazônia**. Boa Vista: Universidade Estadual de Roraima, 2009. Disponível em: https://dialnet.unirioja.es/descarga/articulo/3694130.pdf. Acesso em: 14 fev. 2025.

CARDOSO, E. A. M.; NUNES, C. P. O plano nacional de formação de professores da educação básica (PARFOR): o ideal e a realidade vigente. **Educ. Form.**, *[S. l.]*, v. 2, n. 6, p. 54-69, 2017. DOI: 10.25053/edufor.v2i6.2011. Disponível em: https://revistas.uece.br/index.php/redufor/article/view/159. Acesso em: 25 abr. 2025.

CORRÊA, D. R. *et al.* Formação de professores do campo bragantino e a perspectiva pedagógica decolonial: refletindo saberes, identidade e profissionalização. **Revista Contemporânea**, v. 4, n. 11, p. e6564, 2024. Disponível em: https://doi.org/10.56083/RCV4N11-077. Acesso em: 14 fev. 2025.

DE SOUSA, P. E.; GOMES, S. E. Formação de professores na Amazônia: uma perspectiva decolonial. **Revista de História da Educação Matemática**, v. 10, p. 1-18, 2024. Disponível em: https://doi.org/10.62246/HISTEMAT.2447-6447.2024.10.661. Acesso em: 14 fev. 2025.

DENZIN, N. K.; LINCOLN, Y. S. **O planejamento da pesquisa qualitativa**: teorias e abordagens. 2. ed. Porto Alegre: Artmed, 2006.

FREIRE, P. **Educação como prática da liberdade**. 5. ed. Rio de Janeiro: Paz e Terra, 1967.

FREIRE, P. **Pedagogia do oprimido**. 17. ed. Rio de Janeiro: Paz e Terra, 1974.

FREITAS, N. M. D. S.; MARQUES, C. A**.** Sustentabilidade e CTS: o necessário diálogo na/para a Educação em Ciência em tempos de crise ambiental. **Educar em Revista**, Curitiba, v. 35, n. 77, p. 265-282, set./out. 2019. DOI: https://doi.org/10.1590/0104-4060.61568. Acesso em: 14 fev. 2025.

GUERRA, A; MOURA, C**.** História da Ciência no ensino em uma perspectiva cultural: revisitando alguns princípios a partir de olhares do sul global. **Ciência & Educação**, Bauru, v. 28, e22018, 2022. DOI: https://doi.org/10.1590/1516-731320220018. Acesso em: 14 fev. 2025.

HAGE, S. A. M.; ARAÚJO SILVA, D. Formação de Professores e Professoras nas Amazônias com a Licenciatura em Educação do Campo e seus Princípios Estruturantes: Teacher Educating in the Amazon with a Degree in Rural Education and its Structuring Principles. **Revista Cocar**, *[S. l.]*, n. 29, 2024. Disponível em: https://periodicos.uepa.br/index.php/cocar/article/view/9233. Acesso em: 25 abr. 2025.

JOHANN, C. A. H.; LIMA, J. R. D. Pibid e Residência Pedagógica e seus impactos na formação docente: percepção de coordenadores institucionais. **Revista Linhas**, Florianópolis, v. 24, n. 56, p. 12-31, 2023. DOI: 10.5965/1984723824562023012. Disponível em: https://periodicos.udesc.br/index.php/linhas/article/view/24425. Acesso em: 25 abr. 2025.

MIGNOLO, W. D. **Histórias locais / projetos globais:** colonialidade, saberes subalternos e pensamento liminar. Tradução: Solange Ribeiro de Oliveira. 1. ed. rev. Belo Horizonte: Editora UFMG, 2020.

MIGNOLO, W. Geopolítica do conhecimento e colonialidade do saber. In: SANTOS, B. S. (org.). **Conhecimento prudente para uma vida decente**: um discurso sobre as ciências revisitado. São Paulo: Cortez, 2012. p. 351-394.

NEVES, M. D. A.; NEVES, B. D. A.; SILVA, J. N. D.; SALES, R. E. D. S. Saberes tradicionais: um rio de possibilidades na educação do campo. **Contemporânea – Contemporary Journal**, v. 3, n. 8, p. 12584-12601, 2023. DOI: https://doi.org/**10.56083/RCV3N8-145**. Acesso em: 20 abr. 2025.

PARÁ. **Documento Curricular do Estado do Pará - DCEPA: Educação Infantil e Ensino Fundamental**. Belém: SEDUC/PA, 2021. Disponível em:

https://www.seduc.pa.gov.br/site/public/upload/arquivo/bncc/Documento%20Curricular%20Para%20Educacao%20Infantil%20e%20Ensino%20Fundamental%20Do%20Estado%20Do%20Para-c304d.pdf. Acesso em: 20 abr. 2025.

QUIJANO, A. Colonialidade do poder, eurocentrismo e América Latina. In: LANDER, E. (org.). **A colonialidade do saber**: eurocentrismo e ciências sociais. Buenos Aires: CLACSO, 2005. p. 107-130.

RIOS, V. S. *et al.* Formação docente numa perspectiva decolonial: caminhos propositivos a partir dos multiletramentos críticos. **Educação**, v. 49, n. 1, p. e135/1-22, 2024. Disponível em: https://doi.org/10.5902/1984644487277. Acesso em: 14 fev. 2025.

SANTOS, B. S. **Epistemologies of the South**: Justice Against Epistemicide. London: Paradigm Publishers, 2014.

WALSH, C. **Pedagogías decoloniales**: prácticas insurgentes de resistir, (re)existir y (re)vivir. Tomo I. Quito, Ecuador: Ediciones Abya-Yala, 2013.