


A study on the Socio-Political-Cultural Dimension from the VIII National Forum for Initial Teacher Education who Teach Mathematics

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Abstract: In this paper, we discuss the socio-political-cultural dimension identified in syntheses produced by discussion groups that addressed specific sociocultural contexts in regional forums for teacher education in mathematics organized by SBEM. Theoretically, we draw on assumptions from the Rural Education Degree (RED), Quilombola School Education Degree (QSED) courses, and Intercultural Indigenous Degree (IID), as indicated in normative frameworks related to the Education Teachers. We analyzed 14 syntheses submitted to Discussion Group 05 of the VIII FPMat. We based our data analysis on the axis: "The socio-political-cultural dimension": diagnosis, challenges, and proposals." As a result, we highlight the need to expand discussions about specific sociocultural contexts and marginalized groups in the RED, QSED, and IID courses and Mathematics and Pedagogy teacher education programs.

Keywords: Rural Education Degree. Quilombola School Education Degree. Indigenous Intercultural Degree. Specific Sociocultural Contexts. Teachers Education who Teach Mathematics.

Un estudio sobre la Dimensión Sociopolítica-Cultural a partir del VIII Foro Nacional de Formación Inicial de Maestros de Matemáticas

Resumen: En este artículo, discutimos la dimensión socio-político-cultural identificada en síntesis producidas por grupos de discusión que abordaron contextos socioculturales específicos en foros regionales para la formación de profesores que enseñan matemáticas, organizados por SBEM. Teóricamente, nos basamos en supuestos de las Licenciaturas en Educación Rural (LER), Educación Escolar Quilombola (LEEQ) y Educación Intercultural Indígena (LEII), según lo indicado en marcos normativos relacionados con la formación de profesores de Educación Básica. Para el análisis de datos, consideramos 14 síntesis presentadas en el Grupo de Discusión 05 del VIII FPMat. El análisis de datos se realizó en función del eje: "La dimensión socio-político-cultural: diagnóstico, desafíos y propuestas". Como resultado, destacamos la necesidad de ampliar las discusiones sobre contextos socioculturales específicos y grupos marginados, no solo en los cursos de LER, LEEQ y LEII, sino también en los programas de formación de maestros de Matemáticas y Pedagogía.

Palabras clave: Licenciatura en Educación Rural. Licenciatura en Educación Escolar Quilombola. Licenciatura Intercultural Indígena. Contextos Socioculturales Específicos. Formación de Maestros que Enseñan Matemáticas.

Um estudo sobre a Dimensão Sócio-Político-Cultural a partir do VIII

Fórum Nacional de Formação Inicial de Professores que Ensinam Matemática (FPMat)

Resumo: Neste artigo, discutimos a dimensão sócio-político-cultural identificada em sínteses produzidas por grupos de discussão (GD) que abordaram contextos socioculturais específicos em fóruns regionais de formação de professores que ensinam matemática, organizados pela SBEM. Teoricamente, apoiamos-nos em pressupostos das Licenciaturas em Educação do Campo (LEdoC), Educação Escolar Quilombola (LEEQ) e Intercultural Indígena (LII), conforme indicados em marcos normativos que tratam da formação de professores da Educação Básica. Para a análise dos dados, consideramos 14 sínteses encaminhadas ao GD 05 da VIII FPMat. A análise dos dados foi realizada a partir do eixo: “A dimensão sócio-político-cultural: diagnóstico, desafios e propostas”. Como resultado, evidenciamos a necessidade de ampliar as discussões sobre contextos socioculturais específicos e grupos minorizados, não apenas nos cursos de LEdoC, LEEQ e LII, mas também nos cursos de Licenciatura em Matemática e Pedagogia.

Palavras-chave: Licenciatura em Educação do Campo. Licenciatura em Educação Escolar Quilombola. Licenciatura Intercultural Indígena. Contextos Socioculturais Específicos. Formação de Professores que Ensinam Matemática.

1 Introduction

Following Brazil's democratization and the enactment of the 1988 Federal Constitution, social movements have pressured the Brazilian state to acknowledge the diversity within its population and consider this diversity when guaranteeing fundamental social rights.

We still need to do much to ensure quality and equitable education, recognizing it as a fundamental right. Since the 1988 Constitution and National Education Guidelines and Framework Law (LDB) of December 20, 1996, various operational guidelines, national curriculum guidelines, decrees, resolutions, ordinances, and laws have modified and complemented the LDB. These efforts aim to ensure that rural populations, indigenous peoples, and traditional communities receive primary and higher education, reflecting their aspirations and respecting their lifestyles and social organizations. These actions represent the state's effort to correct historical social inequalities affecting these groups. It's important to note that these achievements resulted from mobilizing social movements, unions, universities, and other civil society representatives advocating for land and other rights.

Several normative documents have been developed and revised in education to promote equitable access to schooling and address various forms of racism, considering the diverse sociocultural contexts of the Brazilian population. This paper will discuss some of these documents, focusing on the training of mathematics teachers. The discussions and documents from the VIII National Forum on the Initial Training of Mathematics Teachers (FPMat), organized by Working Group 07 of the Brazilian Society of Mathematical Education (SBEM), held from November 30 to December 2, 2023, in Teresina, Piauí, will serve as the basis for this analysis.

This theme has been systematically addressed in GT 07 – Teacher Training in Mathematics – since 2018, during the VII International Seminar on Research in Mathematics Education (SIPEM), in Foz do Iguaçu-PR, with the execution and sharing of research that seeks to understand, among its aspects, the relationships between mathematics and its teaching and the contexts of rural, quilombolas, indigenous, and other communities. This has been done

through the analysis of pedagogical projects in the undergraduate programs in Rural Education (LEdoC) and Indigenous Intercultural Licentiate (LII). The results have been published in the form of articles in journals and event proceedings, addressing teacher training in LEdoC in interdisciplinary courses in Natural Sciences and Mathematics (Lima, Lima, Wagner & Khidir, 2023), in LEdoC courses with training in the field of Mathematics (Fernandes, Magnus & Roseira, 2023), in teacher training in LII courses (Bicho, Auarek & Miola, 2023), and the presence, or absence, of Quilombola School Education in LEdoC courses that train Mathematics teachers (Lima, Khidir & Fernandes, 2023).

Based on these discussions, necessary for the organization of the VIII FPMat, it was suggested to the State Forums of Initial Teacher Training in Mathematics, which were held between 2022 and 2023, that they organize a Discussion Group (GD) specifically focused on this theme. The Regional Directorates (DR) sent summaries of the discussions to the National Coordination of GT 07. From the members of GT 07 who research the themes of the new GD, two researchers were appointed to systematize the discussions and recommendations from the DR and present them at the VIII FPMat, where, for the first time, there was a GD dedicated to the debate and problematization of mathematics teaching and the training of teachers who will teach/teach mathematics in specific socio-cultural contexts, particularly Rural Education, Quilombola Education, and Indigenous Education¹. To support the discussions, a trigger text was made available in advance to provide a foundation and stimulate discussions during the event. At the conclusion of the event, each GD prepared a final text to be published in the proceedings, containing the discussions and decisions from the final plenary. For this study, the coordinators of GD 05 at the VIII FPMat, titled "The Teaching of Mathematics in the Training of Indigenous, Quilombola, and Rural Teachers: Practices of Interculturality," who are the authors of this article, revisited the summaries submitted by the DR of SBEM, with the aim of deepening the discussions on the socio-political-cultural dimension.

The methodology adopted for this study was of a qualitative nature, with an interpretative approach (Fiorentini & Lorenzato, 2007). It is a documentary study based on 14 syntheses² produced from GDs focusing on the teaching of mathematics in specific socio-cultural contexts, such as Rural Education, Quilombola School Education, and Indigenous School Education—organized in Regional Forums for the Training of Teachers Who Teach Mathematics.

We considered it relevant to revisit the syntheses to identify recurrences and/or singularities that were not directly associated with the thematic axes proposed in the text of the Proceedings of the VIII FPMat. For this, we prepared a table in which elements of the socio-political-cultural dimension in the syntheses produced by the DR were highlighted. Thus, we considered the socio-political-cultural dimension: diagnosis, challenges, and proposals as an axis of analysis associated with the Training of Teachers Who Teach Mathematics.

The text is organized into four sections, with this introduction being the first. In the second, specific sociocultural contexts and normative frameworks relating to teacher training are discussed. In the third section, we present and discuss the socio-political-cultural dimension highlighted in the syntheses and, finally, we make considerations.

¹ Despite the conceptual differences that exist when using the expression "school" in Quilombola Education and Indigenous Education, in this text we will not use "school", as the notions will be treated in a broader way, considering both the traditional knowledge originating from the communities and school knowledge in basic education and teacher training.

² The synthesis produced by DR São Paulo was published in the form of an article (Pereira das Virgens, Sousa & Valle, 2023).

2 Specific Sociocultural Contexts and Normative Frameworks Related to Teacher Training

We begin the discussion on specific sociocultural contexts by clarifying some normative frameworks related to teacher training for work in rural schools, quilombolas schools, and indigenous schools. Before that, we present what the National Curriculum Guidelines for Initial Teacher Training for Basic Education—DCNFPEB (Brazil, 2019)³ indicate in Chapter III regarding the "curricular organization of teacher training courses" (p. 4), common to all licensure courses.

This document advocates, in item I of Article 7, the "commitment to educational equality and equity as foundational principles of the BNCC" (p. 4), indicating the difference between the meaning of equality and equity, pointing out that the latter must be considered in curricular organization. We also selected item XIV of the same article, which reiterates the defense of the "adoption of an intercultural perspective that values the history, culture, and arts of the nation, as well as the contributions of the ethnicities that constitute Brazilian nationality" (p. 5). In this item, it is made explicit that the document considers Brazil a nation constituted by different peoples, races, and ethnicities, and that historical, artistic, and cultural aspects should be taken into account in the initial training of teachers for Basic Education.

The DCNFPEB mentions the Licenciaturas in Educação do Campo (LEdoC), Licenciaturas in Educação Escolar Quilombola (LEEQ), and Licenciaturas Interculturais Indígenas (LII) only once, in Article 16. Therefore, we consider it appropriate to include other guidelines, ordinances, and decrees that provide detailed descriptions of these courses.

Regarding rural education, we present Decree No. 7,352 of November 4, 2010, which outlines the policy for rural education. The principles are highlighted in Article 2°:

Art. 2° The principles of rural education include:

- I - respect for *rural diversity in its social, cultural, environmental, political, economic, gender, generational, and racial aspects*;
- II - encouragement of the development of *specific political-pedagogical projects for rural schools*, promoting these units as public spaces for research and the articulation of experiences and studies aimed at *social development, economically just and environmentally sustainable, in conjunction with the world of work*;
- III - development of policies for the training of education professionals to address the specificities of rural schools, *considering the concrete conditions of rural life and social reproduction*;
- IV - *valuing the identity of rural schools through pedagogical projects with curricular content and methodologies suited to the real needs of rural students*, including flexibility in school organization and adjustments to the school calendar according to agricultural cycles and climatic conditions; and
- V - social control of the quality of school education through the effective *participation of the community and rural social movements* (Brazil, 2010, no pagination, emphasis ours).

As can be seen, when dealing with the initial and continuing training of teachers and education professionals, the Decree points out the importance of considering the "concrete conditions of production and reproduction of social life in the countryside", in order to meet the demands of running schools in the countryside. In order to implement the aspects indicated

³ On April 23, 2024, the new National Curriculum Guidelines for Initial Training at Higher Level for Basic School Education Teaching Professionals, CNE/CP Opinion No. 4/2024, were approved. However, for this article, we have taken the 2019 guidelines as a basis, as they were in force at the time of the VIII FPMAT.

in the Decree, in 2012, Notice No. 02/2012 - SESU/SETEC/SECADI/MEC was published (Brasil, 2012a), which provided opportunities for the creation of 42 regular Degree Courses in Rural Education in the five regions of the country.

Below, we will detail the characteristic elements of Quilombola School Education present in normative frameworks. From the National Curriculum Guidelines for Quilombola School Education in Basic Education, we highlight paragraph 1 of article 1:

§ 1º Quilombola School Education in Basic Education:

I - organizes primarily the teaching provided in educational institutions based on, informed by, and sustained by:

- a) *collective memory*;
- b) *reminiscent languages*;
- c) civilizational landmarks;
- d) *cultural practices*;
- e) *technologies and forms of work production*;
- f) *oral traditions* and repertoires;
- g) festivities, customs, *traditions*, and other elements that constitute the *cultural heritage* of quilombolas communities throughout the country;
- h) *territoriality* (Brasil, 2012b, p. 3, emphasis ours).

The above excerpt shows that Quilombola School Education values aspects related to history, culture, tradition and ties to the territory. In order to realize the principles of QES, the following aspects are advocated, among others, the "guarantee of initial and continuing training for teachers to work in Quilombola School Education" (Brasil, 2012b, p. 6). Since then, there has been no specific undergraduate course to train teachers to work in quilombolas schools or in schools that serve this student profile in the public school system. In September 2023, Notice No. 23/2023 was published by the Coordination for the Improvement of Higher Education Personnel - CAPES (Brasil, 2023), which aimed to select proposals to offer undergraduate courses through the National Program to Promote Equity in the Training of Basic Education Teachers - PARFOR Equidade -, with the Degree in Quilombola School Education being one of the courses to receive proposals. As a result, 25 proposals for LEEQ courses were selected, making a total of 1,730 places available. Although this action does not require the creation of regular courses at the proposing universities, we recognize that it is an advance in affirmative policies for the inclusion of the quilombolas community in higher education.

On May 14, 2024, the Ministry of Education published Ordinance No. 470, which establishes the National Policy for Equity, Education for Ethnic-Racial Relations and Quilombola School Education - PNEERQ. This policy aims to:

- I - structure a system of targets and monitoring to ensure the implementation of art.26-A of Law No. 9.394 of 1996;
- II - *to train education professionals to manage and teach ERER and EEQ*;
- III - contribute to *overcoming racist practices* in Brazilian education;
- IV - *induce the construction of institutional capacities for conducting ERER and EEQ policies* in the federated entities;
- V - recognize *anti-racist institutional advances*;
- VI - contribute *to overcoming ethnic-racial inequalities in Brazilian education*;
- VII - ensure the right to quality education for all children and young people and adults; and
- VIII - *consolidate the EEQ modality* (Brasil, 2024, emphasis added).

Ordinance No. 470 of 2024 is a historic document that marks a proposal to systematize a policy of equity in the provision of school education for the Brazilian population, with a view to overcoming racism and consolidating EEQ as a teaching modality.

Regarding Indigenous School Education and teacher training, Resolution No. 1 of January 7, 2015, which establishes the National Curriculum Guidelines for the Training of Indigenous Teachers in Higher Education and High School Courses, presents the principles of indigenous teacher training in Article 2°:

Art. 2° The principles of indigenous teacher training are:

- I - *respect for the socio-political and territorial organization of indigenous peoples and communities;*
- II - *valuing indigenous languages as an expression, communication and analysis of socio-community experience;*
- III - *recognition of the value and pedagogical effectiveness of indigenous peoples' and communities' own and differentiated teaching and learning processes;*
- IV - *promoting intercultural dialogues between different types of knowledge, values, know-how and experiences;*
- V - *coordination of the various training spaces, such as the community, the indigenous movement, the family and the school; and*
- VI - *coordination between teachers, managers and other school education professionals and between them and the traditional educators of the indigenous community* (Brazil, 2015, p. 1, our emphasis).

The above highlights characteristics of indigenous peoples that should be taken into account in teacher training processes, such as bilingualism, interculturality, dialogue between knowledge and ancestry.

Bicho, Auarek and Miola (2023), in the partial results of their research, when analyzing the pedagogical projects of Indigenous Intercultural Degree courses (PPC), noted that the projects analyzed did not highlight the "autonomy of indigenous peoples in marking the different knowledge and fundamental knowledge for indigenous school education" (Bicho, Auarek & Miola, 2023, p. 20), and, consequently, of the future teachers who will work in these schools. In addition, they observed that the syllabuses of the curricular components and their bibliographies present in the PPCs analyzed reflect a logic of course organization based on the model of non-indigenous mathematics teacher training courses, which can be considered, in the authors' view, an "inattention" (Bicho, Auarek & Miola, 2023, p. 20).

In general, we can say that over the last 15 years, despite the regulatory frameworks and advances in public policies aimed at training teachers to work in peasant, quilombolas and indigenous contexts and/or with this public, there are many challenges to be faced, especially in initial training courses.

Understanding that the preparation of teachers and future teachers who will teach mathematics should also take place in Mathematics and Pedagogy degree courses, we ask: what can (or should?) be taken into account in the initial and ongoing training of teachers who teach and will teach mathematics in specific socio-cultural contexts?

We will try to answer this question by presenting one possible path, but certainly not the only one: considering the socio-political-cultural dimension as part of the process of training teachers who teach mathematics.

To deal with this dimension, we rely on the discussion carried out by Fernandes, Magnus and Roseira (2023). Fernandes, Magnus and Roseira (2023, p. 4) considered the

"constituent - and interdependent - elements of rural education" *territory, land, culture and school*, which are related to and interwoven with the notion of (rural) identity.

The concept of *territory*, understood as a category of rural education, is not restricted to the notion of geographical location alone, but also involves "disputes between agricultural production logics" (Fernandes, Magnus & Roseira, 2023, p. 4), which are played out between the projects that are being developed in the countryside. 4), between the rural projects defended by Agribusiness, based on large estates and the production of commodities, and Family Farming, with the production of food on small properties that guarantee food security for Brazilians (Confederação Nacional dos Trabalhadores e Trabalhadoras na Agricultura Familiar do Brasil, 2020).

Linked to the notion of *territory*, the element of *land* is the place of production of subjects - peasant subjects in search of a space to produce and reproduce their ways of life, ways which are governed by cycles of nature - marked by the waters of rivers, floods and ebbs, or by the moon. The land not only produces food and income, but also culture (Arroyo, 2011).

The element of *culture* is associated with the notions of *territory and land*. According to Fernandes, Magnus and Roseira (2023), in disputes with capital, the peasant population suffers from the invisibilization and "erasure of traditions such as artistic and religious manifestations and social practices associated with productive activities, either by stigmatizing the countryside as a place of backwardness and the people who live there" (p. 5).

The last element, the rural *school*, also associated with the other elements, must be built on foundations that make the knowledge produced by humanity accessible and that constitute a "privileged space for rescuing and valuing the history and memory of the countryside, as well as for discussing power relations between scientific knowledge and local knowledge" (Fernandes, Magnus & Roseira, 2023, p. 5).

For the authors, the elements that characterize territory, land, culture and school are articulated by (rural) identity:

(...) rural identity serves as the articulating link between the elements of territory, land, culture, and rural school, present and interwoven with collective struggles for rights, recognizing and valuing relationships of belonging to the territory, agroecological production methods, ways of life in the countryside, as well as the relationships established between subjects and work in the countryside, respect for nature, and the implications for curricular organization and pedagogical work in schools, among other aspects. In other words, we consider the diversity of the countryside manifested in its multiple aspects (Fernandes, Magnus & Roseira, 2023, p. 5).

In order to expand the understanding of the socio-political-cultural dimension systematized by Fernandes, Magnus, and Roseira (2023), who took into account the context of Rural Education, it became necessary to incorporate other characterizing elements associated with the contexts of quilombolas and indigenous (school) education. Based on the previously presented framework regarding the normative landmarks and national curricular guidelines pertinent to teacher training in the two mentioned modalities, we can highlight *ancestry* as a distinguishing element that sets quilombolas and indigenous peoples apart from other rural populations.

Through oral tradition, stories, ways of life, and knowledge have been transmitted from generation to generation as a form of resistance to the erasure, social, political, and cultural

invisibility, and other violences experienced by quilombolas and indigenous populations. Krenak (2022), when discussing the relationship with ancestry from the perspective of indigenous peoples, questions the capitalist exploitation model, which expanded and strengthened following the colonization of the Americas and the imposition of an urban civilizational ideology. The implications of this can be seen, for example, in the planet's natural conditions, in the relationship that humans establish with nature, and in the education offered to children in the current school model.

The author illustrates how the school and educational model has shaped children in a way that distances them from the environment from an early age:

Children are isolated in a classroom to be literate and are inculcated, from an early age, with the idea of a sanitary life. (This is very contradictory, because many children from communities do not even have access to basic sanitation, but they are soon taught to be disgusted by the earth) (...) It is the formation of a mentality in which a child should not touch the earth to avoid getting dirty hands (Krenak, 2022, pp. 109-110).

Such a mentality is also explained by Arroyo (2014), who, in discussing the affirmation of racial and ethnic identities, talks about how we arrived at the current unequal social structure that discriminates against ethnic and racial groups in Brazil, extending to Latin America. When particularly addressing education and pedagogical theories, Arroyo (2014, p. 125) is categorical in affirming that "education has directly participated in the construction and preservation of these degrading, segregating representations." According to the author, the colonization process of Latin America, based on violence and supported by a

The civilizing, educational ideal, in the Jesuit catechisms of the sixteenth century and the republican education systems, played a central role in constructing this imaginary that places the different outside, on the other side of the conceptions of humanity, citizenship, republic, and democracy. On the other side, without rights to rights. Those different in ethnicity, race, class, were represented as unequal in humanity. Soulless, hence enslaved. Not people. Objects for sale (Arroyo, 2014, p. 125).

To break with this imaginary that segregates different ethnicities and races, it is necessary to reflect and construct another narrative of the history of education, in which pedagogical theories abandon a conformist and subordinate character to social, racial, and ethnic classification. Social movements are pointing to other paths so that we do not have a single history of education told from the colonizer's perspective:

[...] There are Other Pedagogies that are part of our history. The black, indigenous, quilombolas movements, in their diversity of actions and frontiers of struggle, restore the centrality of race and ethnicity and racial and ethnic identity in our formation. Their pedagogies involve the deconstruction of the racist character that permeates power relations, knowledge of work, spatial segregation, and their reduction to a negative, inferior racial identity (Arroyo, 2014, p. 158).

Quilombola intellectual and activist Antônio Bispo dos Santos constructs the concept of counter-colonialism which, according to the author, is the use of colonialism against itself. In Santos' words (2023),

The indigenous people lived in Brazil in a polytheistic cosmology system. They lived cosmologically integrated, not humanistically. Then the Portuguese arrived with their humanities and tried to apply them to our peoples' cosmologies. It didn't work. Thus, counter-colonialism emerged. Counter-colonialism is simple: it is you wanting to colonize me, and I do not accept that you colonize me; it is me defending myself. Counter-colonialism is a way of life different from colonialism. [...] We created an antidote: we are taking the poison out of colonialism to transform it into an antidote against itself (pp. 58-59).

Santos (2023) brings together the convergences between indigenous and quilombolas worldviews to propose an antidote to the European colonizer's vision. It is no longer possible to think about school education without including the diversity of worldviews of the traditional peoples and communities present in Brazilian territory. And it is from the territories of these peoples and their knowledge, social organizational forms, and sociocultural practices that school education should be considered.

Silva, Silva, Dealdina, and Rocha (2021) assert that for quilombolas educators, Education, in all its complexity, necessarily involves the primordial principle of territoriality with all that belongs to it. Quilombola School Education must be offered in constant symbiosis with Quilombola Education. In the words of the authors, "Quilombola Education draws from, sustains, and inspires itself in quilombolas practices and knowledge," when considering the quilombolas territory as an educational space (Silva, Silva, Dealdina & Rocha, 2021, p. 74).

Given the above, we consider that the socio-political-cultural dimension, expanded to include quilombolas and indigenous peoples and incorporating the element of ancestry, can contribute to the reflection on the model of teacher education programs that train teachers to teach mathematics and continuous education.

3 The socio-political-cultural dimension: diagnosis, challenges and proposals

In this thematic axis, we will discuss the synthesis produced in the GD of the Regional Forums, based on their approaches to the socio-political-cultural dimension and possibilities for the training of teachers who teach /teach mathematics. Initially, we present excerpts from syntheses that made a diagnosis of the research topic in your state or the first relationships established with the topic.

DR-Ceará pointed out the difficulty of finding a researcher in the state who carries out research in Mathematics Education in the context of Rural Education. DR-Tocantins highlighted the absence of works sent to the GD, indicating the little interest of researchers from that Regional Directorate in the topic. DR-Santa Catarina explained that, in the state, as there are no initial training courses in Quilombola and Indigenous Intercultural School Education in the area of knowledge in Mathematics, this public has enrolled in Degree courses in Rural Education.

As this is an emerging theme in the training of teachers who teach mathematics, the situations highlighted did not surprise us. It is possible that the training of teachers who teach mathematics to work in specific sociocultural contexts is being more widespread in regions that are served by LEdoC, LEEQ and LII courses and/or by the promotion of extension activities by universities. Some DR, such as São Paulo, recognized the importance and relevance of the discussions that took place in the GD, considering how it could contribute to a rethinking of teacher training processes and pedagogical practices:

In this final section we present some of the GD's propositions and directions -5 that

can support the continuation of discussions that aim to highlight training processes for teachers who teach mathematics in the context of ethnic-racial relations, interculturality, anti-racist mathematics education and rural education. Such propositions and directions point, in general, to the recognition of the importance of the theme in the context of teacher training, especially to enhance practices that place mathematics learning as part of the humanization process that values the intercultural contexts of the subjects involved in the processes and to overcome other practices that tend to consider mathematics as an end in itself (Pereira das Virgens, Sousa & Valle, 2023, p. 101).

The recognition highlighted by DR-São Paulo, in our view, reinforces the importance of promoting debates and reformulations of training courses for teachers who teach mathematics in order to ensure that the socio-political-cultural dimension is present in pedagogical projects of courses and is carried out in training practices, which could break with a vision of mathematics as an end in itself.

Other syntheses sought to indicate challenges in teaching mathematics and in training teachers who teach mathematics to work in specific sociocultural contexts. DR-Goiás, for example, considers that “the biggest challenge is the lack of knowledge about sociocultural reality and the denial that rural subjects have specific and important knowledge that deserves to be shared” (SBEM Regional Goiás, 2023, p. 7). This observation made by DR-Goiás, about the denial of rural subjects as producers of knowledge, refers to what Arroyo (2014) discusses about the importance of affirming ethnic and racial identities, as a historical reparation for subjects who were subjugated to not having rights.

In a similar way, DR-São Paulo describes the process of erasure and invisibilization suffered by quilombolas peoples, enslaved Africans and the black community in Brazil since the Discovery, in 1500.

After the invasion of indigenous peoples' territories by the Portuguese, nearly 400 years ensued during which indigenous and black people, forcibly brought from their territories, were subjected to slavery and had to fight even to be recognized as human beings. As the last country in the continent to abolish enslaved labor, it took another 100 years to publish a law recognizing the importance of African, Afro-Brazilian, and Indigenous history and culture in shaping the Brazilian people's identity. It took another 20 years to witness discussions about this recognition in the context of a Forum on teacher education for those teaching mathematics. Although slow, it is a movement that cannot retreat behind the curtains that obscure the pursuit of recognition that knowledge is also produced in the context of indigenous peoples, quilombolas communities, rural populations, and in the formative context of minorities (Pereira das Virgens, Sousa & Valle, 2023, pp. 10-11).

The deconstruction of the colonizer's narrative cannot be done on Eurocentric epistemological grounds. It is necessary and urgent to take into account the worldviews of original peoples and quilombolas communities, according to Santos (2023), to build a new educational paradigm.

When we question ourselves about the time it took us – as a community of mathematics educators – to start the debate on this topic in Brazilian Mathematics Education, we agree with Arroyo (2014) when he refers to the school model and practices developed by it, which would still be aligned with a conservative conception and which preserves “inferiorizing segregating [social] representations” (Arroyo, 2014, p. 125), of the catechist-Jesuit model initiated in Brazil with the arrival of Europeans.

Among the challenges, DR-Acre highlights that

The great challenge is to train teachers who work and will work in this context, from the perspective of developing intercultural practices. In fact, it is about breaking with our conceptions of mathematics, recognizing and respecting the existence of cultural practices in terms of different uses of mathematics, to meet certain needs” (SBEM Regional Acre, 2023, p. 1).

We understand that a proposal for teacher training based on principles of interculturality should not focus only on hegemonic – Eurocentric – mathematics, considered universal. Exploring other mathematical logics and rationalities, we believe, would also be formative for teachers and future teachers who teach/will teach mathematics. To do so, it would be necessary to know what specific sociocultural contexts and their groups – social, ethnic, racial – have to say about their practices that mobilize what we call mathematics.

We note that colonizing Eurocentrism would not be restricted only to the type of mathematics privileged in teacher training and, consequently, to the pedagogical practices developed at universities and basic schools. This is also present in normative guiding documents such as the National Common Curricular Base (BNCC). In addition to the mention made by DR-São Paulo, DR-Rio Grande do Sul, when analyzing the document, observed that the quilombolas population or quilombolas school education is mentioned nine times. In the Early Childhood Education stage, no mention is made of education relating to original peoples.

In order to propose new perspectives on teacher training, DR-Rio Grande do Sul and DR-Rondônia used the expressions *Decolonize/Decolonization of the Curriculum*, which “implies addressing the mathematics of culturally diverse groups, promoting self-criticism in relation to social injustices, combat the invisibility of women and ethnic minority groups in the process of recording the history of the development of mathematical knowledge” (SBEM Regional Rondônia, 2023, p. 6). As this is a situation that does not require the replacement of political authorities that control the territory or nation, we consider the expression *decolonize* in the sense of *decolonizing*, that is, as an action to combat racism, inequalities and violence generated by the colonization process.

DR-Minas Gerais, despite not using the expression decoloniality, in our interpretation, refers to this approach when defending a proposal for reformulating the curriculum and pedagogical practices of teacher training courses that teach mathematics to be done in “intense dialogue with indigenous, quilombolas and rural people” (SBEM Regional Minas Gerais, 2023, p. 2). In other words, establishing dialogue with quilombolas, indigenous and peasant peoples implies the construction of proposals *together/with/from* the knowledge and epistemologies of these subjects.

As previously mentioned by DR-Rondônia, regarding the social injustices suffered by certain minority groups, we mobilize the notion of Teacher Training for Social Justice (FPJS) in terms of Zeichner (2008). For the author, the main objective of the FPJS is:

to prepare teachers in order to contribute to reducing the inequalities that exist between children from the low, middle and upper classes in public school systems around the world and the injustices that exist in societies, outside of education systems: in relation to access to housing, food, health, transport, decent work that pays a fair wage and so on (Zeichner, 2008, p. 11).

Based on this objective, Zeichner (2008) systematizes a list of teacher training

practices to “develop greater intercultural sensitivity and teaching competence among future teachers” (Zeichner, 2008, p. 22):

1. Insert admission policies that classify candidates based on a variety of factors, including their commitment to teaching all students, as well as other personal characteristics related to intercultural competence;
2. Modify teaching standards and assessments to more clearly focus on aspects of culturally sensitive teaching (Vavrus, 2002);
3. Help prospective teachers develop a clearer sense of their own ethnic and cultural identity and social location and learn about how various forms of privilege function in their society (for example, the privilege of being white and speaking English, as first language in the United States);
4. Help future teachers deeply examine their own attitudes and conceptions about those who are different from themselves in various ways;
5. Develop high expectations for all students (for example, exposure to successful teaching initiatives for students who have low expectations for them);
6. Carefully supervise and review internships in culturally diverse schools and communities, including cultural immersion experiences in which interns live in culturally diverse communities;
7. Include community members as (non-certified) and paid trainers to transmit cultural and linguistic knowledge to future teachers (for example, workshops in the community);
8. Teach future teachers how to learn about their students’ families and communities and how to transform this learning into culturally sensitive teaching practices (e.g., incorporating communities’ wealth of knowledge);
9. Pay attention to the commitment to diversity that is evident in the program and institutional contexts, and not just in individual courses;
10. Recruit, support, and maintain a more diverse teacher education faculty (Zeichner, 2008, pp. 23-24).

Among the practices listed, we highlight items 6 and 7. Item 6, in our interpretation, would be provided through internships “in culturally diverse schools and communities” (p. 23). In the summaries, the supervised internship was not mentioned by the DR, but there was an allusion to the teaching initiation and pedagogical residency programs, which were remembered as possibilities of spaces existing in the initial training of teachers who teach mathematics and which could enable a dialogue with contexts specific sociocultural courses, in addition to extension courses (SBEM Regional Bahia, 2023; SBEM Regional Minas Gerais, 2023). Particularly, through university extension and the current need for extension formalization, we consider it opportune to promote courses and projects that dialogue with such contexts, “with the intention of leading students in Degrees, Pedagogy and Basic Education to value the knowledge, traditions, values, struggles and forms of social participation of these groups” (SBEM Regional Minas Gerais, 2023, p. 3).

Item 7 of the previous quote is in line with what DR-Tocantins proposes about the importance of having traditional masters in teacher training: “It is necessary to encourage the participation of masters of traditional knowledge from the various traditional communities and existing indigenous peoples in Tocantins in academic activities” (SBEM Regional Tocantins, 2023, p. 3). This positioning of DR-Tocantins is in line with one of the FPJS practices and is materialized through Parfor Equidade, Notice No. 23/2023/Capes, which provides for the participation of masters of traditional knowledge as *guest trainers*, with payment of scholarships, in LII, LEdoC and LEEQ courses. Annex I of the aforementioned notice specifies some of the minimum requirements for the category of *guest trainer*:

I – be a traditional master (known knowledge) or be recognized by an indigenous, quilombolas or rural population organization or segment of traditional peoples and communities , within the scope of their respective community, social group or through titles obtained from IES (Brazil, 2023, pp. 15-16).

When reading the summaries, we noticed that, among the proposals and referrals made, the need for curricular reformulation and inclusion of discussions on specific sociocultural contexts in the Degree in Mathematics and Degree in Pedagogy courses was explained by DR-Santa Catarina, DR-Bahia, DR-Roraima, DR-Distrito Federal, DR-Goiás and DR-Minas Gerais.

DR-Santa Catarina was the only regional board to highlight the importance of reflecting on the training of teacher trainers who teach mathematics, taking into account that the trainer “was trained in conventional undergraduate courses. Therefore, it is necessary to reflect on the training process of these trainers, in order to include an understanding of the dynamics of the field and the appreciation of local knowledge” (SBEM Regional Santa Catarina, 2023, p. 1).

The previously mentioned RD highlighted the need to discuss, reflect and rethink the Degree courses in Mathematics and Pedagogy in order to also be able to contribute to the training of future teachers who will teach mathematics to work in specific sociocultural contexts.

DR-Santa Catarina argues that “it is also necessary to think about how to include discussions around Rural Education, Quilombola Education and Indigenous Education in the curriculum of Mathematics degrees” (SBEM Regional Santa Catarina, 2023, p. 1). In DR-Roraima, it is highlighted “how important it is for initial training courses to be committed to strengthening and building peasant, indigenous, quilombolas identities, etc.” (SBEM Regional Roraima, 2023, p. 1).

DR-Goiás, when dealing with the need to problematize knowledge specific to peasant, quilombolas and indigenous cultures in the training of teachers who teach mathematics, indicates as a possibility the creation of subjects that enable such dialogue between knowledge:

Think about the training of indigenous teachers, quilombolas, etc., can be an important point for the training of teachers in other undergraduate courses and working on subjects that address different knowledge and cultures to bring different perspectives to mathematics course students can contribute to the training of more inclusive mathematics teachers and concerned with the formation of human beings (SBEM Regional Goiás, 2023, p. 8).

Unlike the suggestion made by DR-Goiás, DR-Tocantins considers it opportune to review training curricula for teachers who teach mathematics in order to “advance the discussions that issues of sociocultural contexts should permeate the entire course and not just subjects such as Ethnomathematics and Ethnic-racial Relations” (SBEM Regional Tocantins, 2023, p. 2)

Lima, Khidir and Fernandes (2023), when analyzing how the EEQ is presented in PPC of Rural Education Degree courses, noted such discussions in a few curricular components, generally known as Education for Ethnic-Racial Relations. The authors understand that this component is present in the PPCs by virtue of Law No. 10,639/2003, but that it is not sufficient to deepen the discussion regarding the social-political-cultural dimension inherent to

quilombolas peoples and communities.

In our interpretation, we corroborate the position of DR-Tocantins, by defending that discussions about the socio-political-cultural dimension do not only occur in specific subjects of the curriculum, but rather that there is an effort by the Structuring Teaching Centers of each undergraduate course, which observe and analyze curricular components related to specific training and of a didactic-pedagogical nature that enable such approximations, dialogues and/or integration between local knowledge, originating from specific sociocultural contexts - including, including, the most common aspects of enrolled undergraduates and territories covered by the aforementioned course – and hegemonic mathematical knowledge in initial training that dialogues with Basic Education.

Another recurring aspect present in the syntheses deals with the need to produce teaching materials in mathematics with a focus on specific sociocultural contexts, cited by DR-Mato Grosso, DR-Goiás, DR-Sergipe, DR-Bahia and DR-Minas Gerais.

In DR-Mato Grosso and DR-Goiás, the defense for the production of teaching materials is justified based on the absence and need for materials for indigenous school education. Such materials, in accordance with the National Curricular Guidelines for the training of indigenous teachers, must be constructed based on interculturality and bilingualism, fundamental aspects for the constitution of this school model. Regarding the production of teaching materials focusing on specific sociocultural contexts, DR-Sergipe emphasizes that:

the way in which the textbook in school education is presented does not bring representativeness; the difficulty for teachers to create their own material; the textbook cannot be understood as the only teaching resource available in educational institutions, so it is necessary to expand the methodological teaching repertoire of Mathematics teachers” (SBEM Regional Sergipe, 2023, p. 5).

The DR-Minas Gerais includes as a possibility “Articulating professional master’s degrees around the production of educational products for the schooling of indigenous, quilombolas and rural people, with the participation of these social groups and consideration of their specificities” (SBEM Regional Minas Gerais, p. 3, emphasis added).

We agree with the statement made by DR-Minas Gerais that, when developing educational products aimed at the peasant, quilombolas and rural school population, these should be produced *with/together* with these people, seeking a more horizontal relationship and production.

In general, we can state that the production of teaching materials, particularly mathematics, in dialogue with peasant, quilombolas and indigenous groups, in our interpretation, would provide the opportunity for the mobilization of elements characterizing the socio-political-cultural dimension: the territory, the land, culture, school and ancestry, valuing the identity of these subjects.

In addition to discussing initial training, the DR also highlighted the continuing training of teachers, but without highlighting peculiar aspects of initial training.

Despite not being explicit in the GD-05 syllabus, the discussions, propositions and directions were extended to other contexts and minority groups. The DR-Distrito Federal and DR-Tocantins explained their concern for refugees, foreigners and “itinerant people to expand the understanding of the composition of societies living in Brazilian territory” (SBEM

Regional Distrito Federal, 2022, p. 2). In addition to this audience, the aforementioned DR mentioned the need to advance discussions about gender, sexuality and LGBTQIA+ representation. The DR-Distrito Federal and DR-Rondônia highlighted, in addition to these, the “inclusion of people with disabilities” (SBEM Regional Rondônia, 2023, p. 6), expanding the discussions to the dimension of Inclusive Education.

In the discussions that took place within the scope of FPMat's GD-05, the participants considered that the expansion of themes is pertinent, but that other GDs or SBEM spaces would discuss them and that they would not be restricted to a single GD: “It was suggested that discussions about gender, sexuality, LGBTQIA+ representation, religion, religiosity, refugees, inclusive education and other topics must permeate all GD and not only be discussed in GD 05” (Fernandes & Khidir, 2023).

A singular point perceived in the synthesis of DR-Minas Gerais was the defense of a more active, political participation of SBEM and its members, in relation to the abuses suffered by peasant, quilombolas and indigenous peoples, whose questioning and positioning does not only refer to the initial and continuing training of teachers who teach mathematics:

1) Regarding the Brazilian Society of Mathematics Education – regional Minas Gerais and National – and its relations with social movements and collective actions, the working group proposes that:

- SBEM and its associates demonstrate and engage in actions to fight against PL 490 /2007, approved by the Chamber of Deputies – now, PL 2903/2023 in the Federal Senate – which, by establishing the time frame for the demarcation of indigenous lands, severely attacks the history and struggle of the indigenous peoples of our country and makes territorial violence invisible which particularly affect the most vulnerable indigenous communities.
- SBEM and its associates demonstrate and engage in actions to fight against the MST's CPI, understanding it as a clear attempt to criminalize social movements in the countryside of our country and as a form of retaliation for the reestablishment of agrarian and environmental policies aligned with promoting family farming, valuing traditional peoples and preserving the environment.
- SBEM and its associates demonstrate and engage in actions to fight against the closure of rural schools, a phenomenon known as “nucleation” and ongoing in the state of Minas Gerais.
- May SBEM and its associates get closer to collectives fighting for indigenous (school) education, quilombola (school) education and rural education, understanding their demands and articulating concrete actions to implement their educational demands in Minas Gerais and the country (SBEM Regional Minas Gerais, 2023, pp. 1-2).

The political position claimed in the synthesis produced by DR-Minas Gerais calls on SBEM and its associates to participate in the struggle and defense of original peoples, quilombolas peoples and peasant peoples who, in the year 2024, still do not have their rights guaranteed and are criminalized for fighting and resisting, resistance that educates us, or could educate us. It is the defense of a deconstruction of inferiorizing segregations (Arroyo, 2014).

To conclude, we note that the discussions initiated in regional forums for initial training of teachers who teach mathematics, regarding specific sociocultural contexts, have generally pointed out challenges and proposals for the socio-political-cultural dimension to be present in PPCs of all courses that train teachers who will teach mathematics and that materializes in training practices in these spaces, in the continued training of teachers and in the pedagogical practices to be developed in Basic Education.

4 Final considerations

Based on the objective initially proposed in this article – to discuss the socio-political-cultural dimension identified in syntheses produced by discussion groups (GD) that addressed specific socio-cultural contexts in regional forums for training teachers who teach mathematics, organized by SBEM–, we consider that the discussions promoted in the Regional Forums and FPMat highlighted the need to create and consolidate a space in the SBEM, through these forums and/or other events, to discuss and problematize the training of teachers who teach/will teach mathematics for acting in specific sociocultural contexts. As pointed out by several regional directorates, sometimes such discussions have not yet been started, sometimes there was no space at SBEM for such reflections, due to the absence of a DG to discuss the aforementioned contexts – peasants, indigenous people, quilombolas and others.

Although the DRs have indicated the need to advance discussions on the training of teachers who teach/will teach mathematics for the aforementioned contexts, within the scope of SBEM, government changes have affected the implementation of public policies that serve peasant populations, indigenous people and quilombolas and who have challenges and tensions to be faced within training institutions, we emphasize that the last two decades have been successful – but also full of struggle! – towards advancing regulatory frameworks and implementing permanent actions, such as the regular offering of LEdoC and LII courses. We hope the same happens soon with LEEQ.

We noticed that the discussions held were not restricted only to Degrees in Rural Education, Quilombola School and Indigenous Intercultural, expressing the desire for the socio-political-cultural dimension to also be present in Degree courses in Mathematics and Pedagogy.

Regarding the elements that characterize the socio-political-cultural dimension – territory, land, culture, school and ancestry – these were identified in the syntheses produced, but which still need to be debated, discussed and studied also by NDEs, Colleges of training courses teachers who teach mathematics and their teacher trainers, so that they not only explain the socio-political-cultural dimension and its characterizing elements in the PPC of these courses, but mainly mobilize them in training practices within the scope of teaching – curricular components specific training, didactic-pedagogical and mandatory supervised internship –, research and university extension.

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