Revista Internacional Educon, Volume I, n. 1, e20011010, sep/dez. 2020
*ISSN: 2675-6722 | DOI: https://doi.org/10.47764/**e20011010***

The Brazilian curricula and their policies under the sociocultural perspectives of mathematics education: from the prescriptions to the elaborated-practiced curricula

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ABSTRACT: *The purpose of this text is to systematize the main topics covered by research practices in the context of the Group of Studies and Research in Ethnomathematics (GEPEm) of the School of Education - University of São Paulo, which seeks to discuss, synthesize, and address the main contributions and inquiries within the scope of the sociocultural perspectives of Mathematics Education for/about mathematics curricula and its policies. To this end, Brazilian curricular prescriptions are considered, from the first half of the twentieth century to the present decade, to discuss these syllabus regarding the authors and epistemologies that recognize the need to devise curricula under the perspectives that view school mathematical knowledge in the sociocultural relations and practices that involve its formulation.*
CURRICULUM POLICY. ETHNOMATHEMATICS. MATHEMATICS EDUCATION. MATH CURRICULUM. MAKE VISIBLE.

Introduction

As Wagner Palanch (2016) elucidated in his doctoral thesis, there is an ongoing, yet not regular, movement in Brazil in expanding research that uses mathematics curricula as an object of investigation. From focusing on curriculum prescriptions, official curricula, to focusing on practiced/real curricula, such investigations have taken on different theoretical and methodological perspectives and have multiplied throughout the national territory, albeit unevenly. This fact, in particular, drew the attention of researchers who constitute the Group of Studies and Research in Ethnomathematics (GEPEm) of the School of Education of the University of São Paulo, who were interested in contributing to the curricular reflection from the sociocultural perspectives of Mathematics Education, among which we highlight Ethnomathematics itself.

That being said, we return to Palanch's reflection, which, after mapping research on mathematics curricula in the last three decades of Brazilian history, addresses some relevant questions about the field, being capable of synthesizing concerns and tensions on which other researches may be based, when pouring over the path he's taken. According to the author, these questions emerged in the course of his investigation:

- How can educators contribute to getting teachers to take ownership of curriculum documents and the underlying theories and concepts of teaching and learning? (...)
- How does knowledge about curricula contribute to teacher professional development? (...)
- What curriculum conceptions do mathematics educators have?

- How to promote/enhance teaching authorship in the process of curriculum elaboration and development? (Palanch, 2016, pp. 152-153)

Thereupon, as an attempt to contribute to these issues, we proposed to share the results of these investigations to synthesize the main contributions and questions formulated in the scope of the socio-cultural perspectives of Mathematics Education for/about mathematics curricula. To this end, Brazilian curricular prescriptions were considered, from the first half of the twentieth century to the present decade, to discuss references, authors, and epistemologies that recognize the need to consider curricula from the perspective of mathematical knowledge in relation to sociocultural relations and practices, from its formulation to it teaching. Thus, we propose to promote a shift from curriculum descriptions to practiced curricula, in the survey areas with a mathematics curriculum.

To theoretically substantiate this proposal, we resorted to scientific production both in the field of curricula and in the production of research on mathematics curricula.

For the former, we utilize the contributions, in particular, of Professor-Researcher Inês Barbosa de Oliveira (2012), from the State University of Rio de Janeiro (UERJ), who instructs us on ways to understand the practiced curricula from their state of invisibility imposed by curriculum prescription processes. Their concepts permeate the fabric of the work because they underlie our reading of the sociocultural perspectives of Mathematics Education, which can make the field of curriculum a territory of dispute around guidelines meaningful to those who created them.

Regarding the production originating from investigations on mathematics curricula, we employ the perspectives expressed by Pires (2008), Pires and Silva (2011), Oliveira (2002), Palanch (2016) and Bigode (2019), who enlighten us on the state of mathematics curricula from the context of Brazilian educational reforms in the first half of the last century to the context of the National Common Curricular Base (BNCC, Brazil, 2017). To a greater extent, we rely on the references of Valle & Santos (2018) and Valle & Conrado (2019), which have been dedicated to - starting with Oliveira (2012) and other converging productions - problematizing the idea that a curriculum is something to be "implemented", as if it were possible and desirable to see a certain prescriptive practice in place, whatever its nature. Thus, the authors provoke us to search for curricular (mathematical) policy practices capable of critically accepting the time and action of the local agents that constitute schools, those who put the curriculum into practice.

We will argue about this movement, inverting the curriculum policy vector proposed by the authors, to be desirable in the context of the sociocultural perspectives of Mathematics Education.

1. Prescription and centralization: mathematics curricula in Brazil

In our research, we considered the official documents, in their historical sequence, with the purpose of understanding to what extent they reflected the contributions arising from the sociocultural perspectives of Mathematics Education, which were consolidated in the second half of the 20th century, nominally through Ethnomathematics, despite our findings concerning substantive developments in Critical Mathematics Education (Valero & Skovsmose, 2012) or Sociology of Mathematics (Bauchspies & Restivo, 2001), capable of welcoming critical, anthropological, non-monolithic and unorthodox perspectives in relation to what is considered as mathematical knowledge and its formulation. In this context, we assume the perspective of Pires and Silva (2011, p. 58), when they state:

> The analyzes of the Francisco Campos Reforms (1931) and Gustavo Capanema (1942) show, for example, that the curricular innovations in the area of Mathematics, proposed by Professor Euclides Roxo, in the scope of the Francisco Campos Reform, were attacked in the next reform with little convincing arguments. An example of this was the unification of the mathematical fields - Algebra, Arithmetic and Geometry - into a single discipline, Mathematics, with the goal of approaching them in an interrelated way. Also, in the Campos Reform, there was the orientation that the teaching of deductive geometry should be preceded by a practical approach

> to geometry. But these ideas were strengthened later on. If in the Francisco Campos Reform, the curriculum concept was expanded beyond the mere list of contents to be taught, including a discussion of didactic guidelines, then in the following reform, this important achievement was not consolidated.

Therefore, until now, there has been no more critical formulation from the point of view of both the curriculum and mathematical knowledge. This is justified by the fact that many critical proposals would only be consolidated in the academic environment a few decades after such reforms occurred. In the prescribed curricula provided by the aforementioned reforms, mathematics emerges, for the first time in Brazilian history, as the unification of fields through which we understand it today. Furthermore, we must highlight that, in addition to the list of contents to be taught, the Francisco Campos Reform includes, unprecedently, a certain discussion of didactic guidelines on pedagogical work with Mathematics, which does not remain in the following reform.

After a few decades, in the period from 1960 to 1980, which coincided with the military dictatorship in Brazil, the Movement of Modern Mathematics was consolidated. With this in mind, it is important to consider that:

> The official curricula were gradually incorporating the Movement's ideas, curiously influenced by collections of textbooks that published ahead of government agencies, introducing themes related to Set Theory, emphasizing the use of symbolic language. Because it was proposed by textbooks, this idea quickly reached schools and had a great influence, especially in the selection of the contents to be taught. With criticism of the Modern Mathematics Movement and also with the demand for new curricular orientations more aligned with the Brazilian educational context, new ideas began to be incorporated into curricula in general and, particularly, in Mathematics. (Pires & Silva, 2011, p. 58)

It was not to be expected that, at that moment, there would be any problematization of curricular policy or the nature of mathematical knowledge, including its cultural, human, "fragile and fallible" character (Ernest, 1991). However, with the return of democracy, this began to change, both due to the increase of problematization in the field of curricula and in Mathematics Education, and democracy being a more fertile political environment to accommodate such propositions.

Relevant experiences in the context of curricular policies in some Brazilian states and municipalities - of which São Paulo is a prime example for having Paulo Freire as the Municipal Secretary of Education (Valle & Santos, 2018; Oliveira, 2002), as we will also address later in this work - flourish when challenging the idea that the imposition of a centralized and prescriptive curriculum policy is the only way to structure curriculum policies. These experiences will lead us to a process of reflection and curricular dispute that are consolidated through legislation (both in the constitutional text itself and in the text of the Law of Guidelines and Bases of National Education).

As a result of part of these reflections, we have the National Curriculum Parameters (PCN, Brazil, 1997), which have advanced, to some extent, when compared to the previous national curriculum policy. This is because:

> They highlight the importance of overcoming the linear organization of the contents and the need to make explicit the connections between them, taking inspiration from the metaphor of knowledge construction as a "network of meanings".
>
> • They incorporate, already in elementary education, the study of probability and statistics, and highlight the importance of geometry and measures to develop fundamental cognitive skills.
>
> • They indicate Problem Solving as a starting point for Math activity and discuss ways to "do Mathematics" in the classroom**, highlighting the importance of the History of Mathematics, Ethnomathematics, Modeling and Information and Communication Technologies**. (Pires & Silva, 2011, p. 63, emphasis added)

In effect, textually, the PCN (1997, p. 21) goes from the recognition that there is "little connection between Mathematics and its practical applications" to thinking about contextualized alternatives and related to cultural practices, in which it constitutes/uses/mobilizes mathematical knowledge. At that point, the document mentions that:

> Among the works that have gained expression in the last decade, the Ethnomathematics Program stands out, **with its alternative proposals for pedagogical action**. Such a program contrasts with the guidelines that disregard a more intimate relationship between Mathematics and sociocultural and political aspects - which keeps it untouched by factors other than its own internal dynamics. From an educational perspective, it seeks to understand the thought processes, the ways of explaining, understanding, and acting in reality, **within the cultural context of the individual**. Ethnomathematics seeks to start from reality and arrive at pedagogical action in a natural way, **through a cognitive approach with a strong cultural foundation**. (Brazil, 1997, p. 21, emphasis added)

Despite the fact that there is not exactly a consensus on the concept of Ethnomathematics, we share the notion of D'Ambrosio (2020), that recognizes it as a relevant contribution to situate mathematical knowledge, along with the History of Mathematics, Mathematical Modeling, and Information and Communication Technologies, within sociocultural practices, representing an interesting movement to stimulate practices inspired by its premises, instead of taking it as a methodological prescription. In the context of Cultural Plurality, taken as one of the axes of the document, it is stated that: "The construction and use of mathematical knowledge is not done only by mathematicians, scientists or engineers, but, in different ways, by all sociocultural groups"(BRASIL, 1997, p. 27). Understanding how it is possible to consider this statement in pedagogical work becomes one of the goals of teaching mathematics. "In this work", continues the document, "the History of Mathematics, as well as the studies of Ethnomathematics, are important to explain the dynamics of the production of this knowledge, historically and socially" (Brasil, 1997, p.28).

With the deepening and widening of disputes over curricula and curricular policy, new achievements are celebrated when Federal Laws 10,639, in 2003, and 11,645, in 2008 are instituted, highlighting the need for considering Afro-Brazilian and African History and Culture, in the former, and Indigenous, in the latter. On this topic, researcher Nilma Lino Gomes states that:

> Given their importance in the constitution of our society, this knowledge should be part of school education, non-school educational projects and the field of knowledge in general, especially after the amendment of Law 9,394/96 (Law of Guidelines and Bases) by Law 10,639/03, which makes the teaching of Afro-Brazilian and African History and Culture mandatory in the curricula of elementary and high schools, both public and private. This law was regulated by Resolution CNE/CP 01/04 and by CNE/CP 03/04, which establish the National Curriculum Guidelines for the Education of Ethnic-racial Relations and for the Teaching of Afro-Brazilian and African History and Culture. The duties of the Union, states, municipalities, the Federal District, universities, councils, and other sectors related to education for the implementation of this legislation were registered in 2009 in the National Implementation Plan of the National Curriculum Guidelines. The knowledge expressed in these documents is still not properly considered as such by the field of knowledge and educational theory. It is a dispute, mainly, in the field of curricula. (Gomes, 2017, p. 68)

Within the National Curriculum Guidelines for the Education of Ethnic-Racial Relations and for the Teaching of Afro-Brazilian and African History and Culture (Brazil, 2004), Ethnomathematics is mentioned again, as well as the need for understanding the cultural nature of knowledge, not only mathematical, but, more broadly, of the knowledge "accumulated by humanity", in which different ways of understanding/representing and intervening in reality have been historically neglected, especially in traditional communities, black, and indigenous peoples.

Indeed, different surveys (Costa & Silva, 2010; 2016) carried out by GEPEm members, have been discussing, since at least 2001, the way in which black, African and Afro-Brazilian cultures, and indigenous

cultures relate to school mathematics, from the perspective of Ethnomathematics. The results of these researches address a relevant problem which, centered on the fact that, to the extent that curricular prescriptions ignore the absence of distinct peoples, groups, and communities and their know-how in the construction of what they call "knowledge accumulated by humanity", multiplies in schools.

> (...) reports of black children and young people stunted in their development and self-esteem by hurting their dignity, in the comparison of historical, aesthetic, family and social values and knowledge that take as a reference the dominant culture imposed on them by the curricula. (…) In turn, indigenous cultures are present in the curriculum of non-indigenous schools as a folk product, as something from the past and unrelated to the current Brazilian situation. (Costa & Silva, 2010, p. 248)

Therefore, the National Curriculum Guidelines for the Education of Ethnic-Racial Relations and for the Teaching of Afro-Brazilian and African History and Culture welcomed the need to question the status of mathematical knowledge, the cultural product of countless social disputes around the sense and the meanings of understanding and representing the world. These ways of understanding, representing, interacting and intervening in the world compose complex systems that, under the perspective of Ethnomathematics we have adopted, "include, at all times and places in the world, strategies for observation, comparison, classification, evaluation, quantification, measurement, representation, inference and communication ", as explained by D'Ambrosio (2020, p. 7, our translation).

It does not make sense, therefore, that "observation, comparison, classification, evaluation, quantification, measurement, representation, inference and communication" strategies are not "universal" but universalized by means of "knowledge accumulated by humanity", stemming from countless disputes, many of them coinciding with violent processes of enslavement and colonization, responsible for what Boaventura Sousa Santos (2007) has called epistemicide. Disputes with indisputable implications for what Michael Apple (2011) understands as "official knowledge policy", expressly represented - from its assumptions to the interests it generated - the policy of establishing a National Common Curricular Base, as we will discuss shortly. In the context of the National Curriculum Parameters (PCN) - more consistent and better positioned ideologically than the Base we have today- discussed, however, the fact that:

> To be successful, the school and its teachers cannot improvise. They have to undo the racist and discriminatory secular mentality, overcoming European ethnocentrism, restructuring ethnic-racial and social relations, desalinating pedagogical processes. This cannot be reduced to words and reasoning unrelated to the experience of being belittled, lived by black people (...) Therefore, we have pedagogies to combat racism and discrimination to create. Of course, there are experiences of teachers and some schools, still very sporadic, that will help a lot. (Brazil, 2004, p. 15)

Recently, SBEM co-signed, as an educational entity representing Brazilian mathematics educators, projects elaborated by the National Association of Graduate Studies and Research in Education (ANPEd) and the Brazilian Curriculum Association (ABdC), challenging Ministers of Education, their secretaries and directors linked to the preparation of the Base, Deputies of the Education Commission and the National Education Council (CNE) on inconsistencies, unexplained inflections, in addition to the anti-democratic character that its formulation process assumed (ANPEd & ABdC, 2015). These letters were never even answered. Therefore, it is unsurprising that the wording of the previous excerpt outlines much more authentic concerns of the Brazilian educational community than the mere reach of competences and skills that the Base would propose - including the fact its formulators, during the process, have neglected the contributions of the educational entities that, such as ANPEd, ABdC and SBEM, among many others, would manifest themselves critically.

Advancing in the discussion of how the school can contribute to the fight against racism and discrimination, we read in the PCN that:

> The inclusion, while still respecting the autonomy of Higher Education establishments, in the contents of subjects and in curricular activities of the courses it teaches, of Education of Ethnic-Racial Relations, of knowledge of African origin and/or which concern the black population. For example: in medicine, among other issues, the study of sickle cell anemia, the problem of high blood pressure**; in Mathematics, contributions of African origin, identified and described by Ethno-Mathematics**; in Philosophy, the study of traditional African philosophy and contributions by African and Afro-descendant philosophers today. (Brazil, 2004, p. 24, emphasis added)

At this point, the curricular policy, although "official" and directive, incorporates different pedagogical trends and traditions that confirm its hybrid character (Brasil, 2010, p. 44) and that evidently allows mentioning the existence of subsidies, in the context of Education from research-practices in Ethnomathematics - of which D'Ambrosio (2010; 2020) has been, since its idealization, one of our main references - capable of contributing to the practice of teachers and mathematics teachers interested in learning about manners to approach racism in their classrooms and schools (Costa & Silva, 2010; 2016).

We have gone backwards, as we will see, with the promulgation of the BNCC, which proposes to "guide the curricula of the teaching systems and networks of the Federative Units, as well as the pedagogical proposals of all public and private schools of Early Childhood Education, Elementary Education and High School, all over Brazil "(Brazil, 2017). In addition to the criticism over the document disregarding all research-policies-practices aimed at understanding mathematical knowledge as a specific sociocultural practice, there is not a single mention of Ethnomathematics, which has disappeared, *for the time being*, from the national curriculum policy, a more centralized and prescriptive than any other document ever produced in our country. It is not up to our already fragile democracy – as intended, including an *epistemological democracy* - to tolerate the possibility that a small group should proclaim themselves capable of prescribing what different schools must do in the most different contexts while, at the same time, disregarding the contribution of research in Mathematical Modeling, History of Mathematics, Sociology of Mathematics, Critical Mathematics Education and, especially in our case, in Ethnomathematics.

Firstly, because this area has been identified as capable of fostering responses and political practices to fight racism, as the national curriculum policy has asserted in the PCN, in a more implicit way, and in the DCN, in an explicit way. This very symbolic exclusion from a document constructed from a highly antidemocratic process (Dourado & Aguiar, 2018), can be understood as a positioning on Ethnomathematics - a name capable of bringing together different researchers and teachers, mobilizing different research practices - as diametrically opposed to the current national curriculum policy, expressly due to its anti-democratic, prescriptive, and centralizing character:

> The discussion about how Mathematics is presented in the National Common Curricular Base (BNCC) proposed/imposed by the Ministry of Education (MEC), can be made from multiple perspectives, from the epistemological view on the nature of mathematical thinking to the didactic conception it conveys. Although its defenders try to appear neutral, supporting an alleged asepsis when hitting the key that "mathematics is immune to ideologies" or that "the base is not a curriculum", the document fails to hide its ideological orientation expressed in a vision that reduces the mathematics to a watertight collection of items which are nothing more than evaluation descriptors, now rebranded as "skills". (Bigode, 2019, p. 123)

In this sense, it is observed that the dissatisfaction of the Mathematics Education academic community towards the Base and what it represents, in terms of an education policy, is based on the criticism made from sociocultural perspectives, in addition, of course, to the criticisms arising from the psychology and history of mathematics:

> As the proposal presents itself, where the numbers appear to be magically dissociated from the construction of structures, there is a mistake both in the cognitive capacity of our children and in the methodological treatment for expansion and development of the numerical system, making the treatment limited in the first year at 30 and in the second at 100, as a reference, which reveals a profound misunderstanding as to the processes of mathematical literacy. (Muniz apud Bigode, 2019, p. 131)

There are also, in the position of Cristiano Alberto Muniz, former president of SBEM, excerpts that refer us to the sociocultural perspectives of Mathematics Education, as we share below:

> (…) Historical and ethnomathematics perspectives are missing, which are not included in BNCC. Thus, social, cultural, and affective values of learning mathematics are not made explicit in the school learning of mathematics proposed by the BNCC, explicitly foregoing the trends of Mathematics Education, such as the historical, cultural, communicational, playful approach, as well as the new technologies that, when present, are marginal and allegorical. In summary, there seems to be a silencing of the proposal of what should stay out of school, of aspects of the history of mathematics, of transversal themes. (Muniz apud Bigode, 2019, p. 132)

Muniz's criticism, added, of course, to the criticism made also by Bigode (2019), which brought together criticism from educators, mathematicians, arose during the process of formulating the Base. As well as agreeing with them, Bigode (2019, p. 134) adds his own critics. For example, "The concept of Multiples is introduced in the 6th year, but the problem solving about multiples appears only in the 7th grade. How can you learn a concept that is separate from the problems that generate it?".

The whole scenario of criticism formulated against the BNCC both in the context of educational entities with ANPEd and ABdC (2015), many of them supported by SBEM, as well as in the context of research-practices by different authors who addressed the criticism, justifies the expressed perspective of ex-SBEM President Cristiano Muniz, which led him to state that:

> Regarding mathematical learning, based on the theoretical-epistemological perspective, as well as the methodological of Mathematics Education, it is revealed, in many aspects, a certain setback in relation to the advances achieved in the latest documents and policies of MEC, especially of PCN, GESTAR, Learning and Development Rights, and more recently, from the PNAIC of mathematics. Additionally, fundamental knowledge consolidated through scientific research in the field of Mathematics Education is not included in the proposal. On the contrary, we see some inexplicable and unsustainable setbacks. (Muniz apud Bigode, 2019, p. 129)

That being said, the scenario that was proposed and imposed on us, as worded by Bigode (2019), with the National Common Curriculum Base, can be included in the statement made by Pires and Silva (2011, p. 58) about the history of national curriculum policies and their impact on the mathematics curriculum:

> The study of curriculum development in Brazil shows that curriculum decisions have, historically, been marked by government actions and not from movements born in schools, led by teachers, or by the civil society. One of the hallmarks of Brazilian public policies, regarding curricular issues, is the lack of curricular implementation actions, as if new ideas were to be transformed into practice by magic. In addition to the lack of implementation actions, another mark is the lack of monitoring/assessing of the proposed innovations, which does not allow for adequate evaluation, accounting for successes and errors.

We expressly disagree with the notion that it is possible and desirable to "implement a curriculum" - an idea that denies the existence and legitimacy of *elaborated-practiced* curricula to be discussed below - also because we understand that the idea of "curriculum implementation" has permeated the logic of different practices-policies-researches until reaching the National Common Curricular Base, which represents its peak in national curriculum policies. Together, prescription and centralization have marked the history of Brazilian curriculum policy, despite the aforementioned exceptions, including

mathematics curricula. However, we also know that other experiences were, are, and will be possible, according to Valle's argument (2020) that Freire, by registering another way of *critically thinking* about the democratic public school in his curricular policy, demonstrates his ontological viability inscribed in the history of Brazilian education, making it possible. To better understand this statement, we further dedicate ourselves to the discussion, in *zoom*, as expressed by Lynlia Sachs (2018), about the experience of the curricular policy promoted under the management of Paulo Freire, at the Municipal Education Bureau of São Paulo.

2. Mathematics in Paulo Freire's Curricular Reorientation Movement

Analyzing the educational and curricular planning movement in the policies mobilized when the educator Paulo Freire acted as Municipal Secretary of Education of São Paulo, from 1989 to 1992, the researchers from the curriculum field Alice Lopes and Elizabeth Macedo (2011, pp. 64-65) clarify that:

> Planning begins with the identification of basic contradictions. From this analysis, a general generating theme emerges. This identification occurs by means of the analysis of the social reality in which the school is inserted, but unlike what occurs in Tyler's rationale, what is highlighted is the way the subjects experience this reality. Thus, teachers and students (and the community) are active participants in the process of identifying the general generating theme. The second stage of planning is the selection of generating themes (or generating words, in the case of literacy) that will compose the curriculum and its coding and decoding. For the selection of these themes, a systematic analysis is carried out, beyond disciplinary limits, in order to reduce them to those with greater educational potential, that is, from which the experiential reality can be problematized. Each theme is codified by a situation that represents and exemplifies it (a photograph or a text, for example), and it is essential that this situation is existentially significant for the subjects. The last stage of planning is the elaboration of material to guarantee, using the dialogical methodology, the problematization of the themes, systematically returning to students the elements they delivered in an unstructured way during the investigation of the thematic universe.

The principles of participation, decentralization, and autonomy that guided the policies created by the government of Luiza Erundina (*Partido dos Trabalhadores* – Worker's Party), in which Freire served as Municipal Secretary of Education, contributed to the curricular policy presented to the municipal network, to democratically incorporate the experience of teachers in pedagogical work, carried out in partnership with universities. The movement built by Freire and his team distinguished itself from the traditional curricular formulation, as it was based, previously, on these pedagogical experiences already underway in the municipal network to collectively and participatively build curricular documents that, far from prescribing, shared emancipatory practices carried out in the midst of established partnerships (Valle & Santos, 2018).

In the Mathematics Area Vision Document, constructed by many hands in the course of the Freirean movement, it is stated that:

> In the day-to-day of the classroom, in many schools today, not all in the private sector, mathematics has already abandoned the sequences of rules, the emphasis on memorization, the intensive training of algorithms. It has also abandoned concerns about sets and structures of Modern Mathematics. It has become a subject more integrated into the reality of the student, where he is asked to create and participate in the construction of knowledge. However, these new conceptions still only reach a small portion of Brazilian schools. At the same time, research on mathematics education is being developed today with an intentionality never seen in any other historical moment. (PMSP / SME, 1992, p. 9)

The contribution of other areas of research and practice in mathematics education are signaled by the authors as renewed theoretical possibilities to rethink the teaching and learning of mathematics, like those that, as the document says, focus on social aspects related to education - from which pedagogical proposals have also derived, as they point out. According to the document:

> Of these proposals, we highlight: **ethnomathematics, which seeks to value the mathematical content of different social groups and the informal concepts constructed by the student in their life outside of school**; the use of the History of Mathematics, which has served as an instrument to motivate learning and promote the acquisition of concepts, the student eventually faces similar obstacles as those of the creators of these concepts. The current movement in mathematics education allows us to envision a future in which this subject will no longer seem meaningless or frightening, as it has been for most students in the last two or three centuries. (PMSP / SME / 1992, pp. 9-10, emphasis added)

Another change, personally expected by Freire, in the practice of mathematics teachers consisted in facing the position relegated to mathematics, which, in the words of the educator, was taught as "something for gods or geniuses" - according to how his generation of Brazilians learned, especially in the northeast. When not gods, "geniuses, because a concession was made to the genius, who could do math without being a god", Freire quipped (apud D'Ambrosio & Domite, 1997, p. 8). In this context, he worried about "how many critical intelligences, how many curiosities, how many inquirers, how much abstract capacity to be able to be concrete we have lost".

Hence, the urgent need for the university to welcome the movement, in order to accompany teachers and schools, addressing its main tensions, answering the questions identified in the experience of the difficulties and challenges of everyday life, which has been changing.

An exemplary case of this partnership between universities, through their researchers, and the Municipal Education Bureau, made real in the schools' daily lives, in each challenging reflection that imposes on its practitioners, is the production of Domite's own doctoral thesis, which we have referred to. In her work, Domite seeks to understand how this movement of stimulating problematization took place as a path, as a teaching methodology, not only of mathematics, of course, but as an integrating axis of an interdisciplinary curriculum. Accompanying teachers in schools and producing her research and thesis simultaneously, Domite dedicated herself to reflect precisely on the impasses and paths experienced by teachers with whom she worked in the construction of this curriculum.

We consider Domite's contributions, in her thesis, thought-provoking responses to the challenges we have identified and to the tensions experienced at the time, because they represent explanatory syntheses of what the researcher observed in schools during that period. In this movement, she identified four strategies that were used by mathematics teachers from the municipal network, which she dedicates to reflect upon and discuss in her work. These are: "detecting situations in the school or wider context", "inviting students to the school of the generating themes", "starting from a previously chosen subject/theme" and "starting from a known mathematical model" (Domite, 1993 , p. 168). The potential of her work precisely lies in having been able to describe real classroom contexts, accompanied by the researcher, in which it is possible to identify each of these strategies in progress. In these situations, Domite theoretically discusses the potentials and limits found by her and the teachers with whom she worked during the activities.

Briefly, we will describe each of the strategies identified in this work, in which it is possible to note the convergence to the content proposed in the guiding documents. In the first one, to detect situations, "the teacher must be attentive to situations that begin to prove significant for the student; that is, to perceive certain relationships and particularities" (p. 168). Domite suggests that teachers, when using this strategy, identify points of convergence between themes that are being debated by students and mathematical contents that allow other approaches to the same themes, prompting students to read further. Here, the teacher, as the author says, is part of a dialogue already initiated by the students to take advantage of it, as a trigger.

In the second strategy, inviting students to choose the theme, "the teacher guides the learning of Mathematics from the need to understand a situation of social reality, problematizing it" (Domite, 1993, p. 169). Here, the teacher intentionally proposes the identification of themes by the students and plans their pedagogical work so that the mathematical contents orbit around the chosen theme. In Domite's words, the teacher uses this strategy "initially making a critical analysis of the traditional teaching of Mathematics and then exposing a learning situation, usually experienced by then with another group of students, based on a theme generator "(p. 169).

Starting from a previously chosen theme, the third strategy consisted of a widely used path, as the author points out, because it allows the teacher to identify, prior to contact with students, what are possible and potential connections between the theme to be proposed and the mathematical content that will be developed.

> It is up to the teacher, based on their chosen theme, to initiate a problematization that motivates the connection of contents, which they wish to introduce, with real situations that students know and experience. It is worth mentioning that this proposal to address a problematization does not prioritize, as in the others, starting from real situations. We also consider problematizing fictitious situations, such as a simulation of what is real, a game. The teacher's art then consists in raising questions related to the fixed theme (chosen context, real or not) and, according to the group's interest, trying to address them as problems. (Domite, 1993, p. 169)

We see in the excerpt presented that, even when using this strategy, the teacher does not shy away from the debate with the students to identify a set of questions pertinent to the context of the chosen theme to address them. It means to say, for example, that if the theme chosen by the teacher is basic sanitation or housing conditions in the neighborhood where the school is located, it is the students who will forward their own questions about these themes, with a greater or lesser level of depth or critical awareness, according to a variety of factors, including their age group.

In the fourth and last strategy identified, starting from a mathematical model, "the problematization, in this case, constitutes a dialogue aimed at analyzing a problem analogous to the one studied, that is, that uses this same mathematical model for its solution "(P. 170). When using this strategy, the teacher presented a known mathematical model that, according to her knowledge, can be applicable to other limit-situations in the daily life of the community where the school is inserted. Its goal, therefore, is to build an analogy between the model presented and the ability to solve a problem effectively, experienced by students and their families. In the author's words,

> From the mathematical instrumental that facilitated the conversion of a problem into its mathematical language, the teacher presents and analyzes problems, within other contexts, that use that same instrument. It is up to the teacher, initially, to address a problematization with questions that argue about the search for a similar problem from the mathematical point of view, generated in another context. Once the problem is located, extend the dialogue to interpret the mathematical model studied in the first problem, in the language of the second. (Domite, 1993, p. 170)

It is also a fruitful way to think about the organization of mathematics education, meaningful for all who experience it. Furthermore, what is possible to infer from Domite's study is the different ways mathematics teachers found to reconcile mathematics teaching with the proposal of pedagogical work via a generative theme. We perceive, therefore, and this we would like to emphasize, the ways the structuring of the curricular policy proposed by the Bureau is recontextualized by teachers, as advocated by Lopes (2005), revealing possible paths of approximation between what Freire and his team wanted and the daily lives of municipal classrooms.

Recontextualization can be understood, according to the author, as reinterpretations, "inherent in the processes of circulation of texts", in which "the action of multiple contexts in this reinterpretation is articulated, identifying the relationships between processes of reproduction, reinterpretation, resistance and change, in different levels "(Lopes, 2005, p. 55). To avoid falling into a reading considered narrow

because it treats the recontextualization processes as distortions or deviations, we consider, in the same way as Lopes, that the recontextualization can be significant to express how macro and micro relations occur, implying in the treatment, as a result of Stephen Ball's concept of hybridism (2001, p. 102), in which global, distant, and local logics are articulated, confronted, and related. For the author, the official curricular speeches are confronted with the real possibilities of their realization - in addition to the entire personal trajectory, of personal and professional training, of the teachers -, which makes us understand the recontextualization not as a deviation, but as a possibility of approximation between what is officially intended to be built and the different daily lives, where this discourse is reinterpreted according to different characteristics.

To assume this perspective implies that, although teachers and their schools had adhered, on their own volition, to the curricular reorientation project and were accompanied by specialists theoretically aligned with the proposal, contextualization and amalgams will necessarily characterize the way they incorporate guidelines into their daily lives, according to a myriad of factors. This is evident in the strategies identified by Domite, since they demonstrate ways found by mathematics teachers when trying to reconcile the initial training they had, the objectives of the project, the permanent training program to which they were having access, the guidance of specialists and the potential difficulties particular to its context. In this attempt, strategies emerge that were not necessarily foreseen by the team of specialists in mathematical education or even by the movement's managers, but that signify a creative movement in order to reframe what they learned during the training program, taking as reference their own practice, their limits, and possibilities.

Final considerations

Understanding this scenario, a real disputed territory, as recognized by Arroyo (2013), can offer us relevant evidence to add to research-policies and curricular practices, especially inspired by the socio-cultural perspectives of Mathematics Education, so that they consolidate themselves as allies to pedagogical work. The fact that Palanch (2016, p. 125) states, as a result of his research, that "the curriculum modeled by teachers is often distanced from what is officially prescribed" only reiterates and adds evidence to the argument that it is not desirable nor possible to prescribe a curriculum, based on the idea that it is possible to prescribe homogeneous practices for contexts, as it is the case in Brazil. Despite their argument that there is flexibility expressed in the "diversified part" that each municipality and state can establish, large-scale evaluations will eventually force a process of narrowing the curriculum, as stated by researchers Alicia Bonamino and Sandra Zákia Sousa (2012), when commenting on the impacts of external evaluations.

This also leads us to highlight the relevance of considering the pedagogical practices that have been systematically made invisible by such policies (Oliveira, 2012); fundamental when we take the sociocultural perspectives of Mathematics Education that recognize and welcome the time of the agents within the schools, the practitioners of the mathematics curriculum in its different contexts (Valle & Santos, 20018).

The publishing of the Teacher's Practice Report Notebook, as commented on by experts, became an interesting tool for the permanent formation of the municipal school network, which could learn to identify what worked, what didn't work, and, mainly, ways to overcome what did not work through the sharing of practices, solutions, strategies, resolutions (Valle & Santos, 2018; Valle, 2020). Once again, the relevance and the need for this to be a movement accompanied by the critical eye of the researchers and experts are highlighted, which is revealed in the incorporation of their comments in the notebooks. By incorporating them, Freire and his team allow practices carried out in a confined, contingent manner, to be objects of sharing and study of the entire municipal network, which is inserted in a movement of *critically thinking* about curricula. Thus, one more assumption of the Curricular Reorientation Movement is evidenced: that of overcoming the dichotomy between those who think and those who write the curricula, tributary of what the educator considered as banking education, so present in the paradigms of modern curricular policy.

We conclude, then, with the systematization of some of the subsidies taken from the experience of Freire's curriculum policy, necessary for understanding the meaning and significance of the principles of Freire's critical pedagogy, mobilized within the scope of a consistent and coherent curriculum proposal:

- Firstly, the understanding that the *university-school relationship* has a potential and relevant role in the construction of non-prescriptive curriculum policies, capable of recognizing and valuing the pedagogical practices of mathematics teachers, legitimate practitioners of the curriculum, as an indispensable element to reflect on the curriculum policy. During the Curricular Reorientation Movement, teachers and researchers in Education interact over many common interests, immersed in the daily lives of schools, recognizing themselves as indispensable interlocutors in the production of knowledge, in our case, of Mathematics Education.
- Secondly, the understanding that prescriptive, centralized curricular policies make the pedagogical work already underway in thousands of Brazilian schools invisible, in addition to being based, as a rule, on fragile and inconsistent arguments related to the need for prescription. Freire's experience demonstrates that such arguments are fragile insofar as it establishes a curriculum policy, by adherence, in the largest Brazilian city, which recognizes and reiterates *teaching autonomy and authorship* - teachers and professors recognized as authors of the curriculum.
- Thirdly, the need for researches in Mathematics Education to dedicate themselves *to make visible the emancipatory practices* already underway in mathematics classes, turning them into the motto for the relationship between university and school, not under the perspective that the university should supplant, replace, neglect the know-how of teachers, practitioners of the curriculum, but that they should, instead, contribute with what is already being done, such as the experts' contribution in the Practice Report Notebook, aiming at their improvement, which is not displaced from context and everyday life, where the curriculum is practiced.
- Finally, there is also the need to systematize and make public - accessible to teachers of Basic Education, especially among Brazilian public schools - the contributions of Ethnomathematics, Critical Mathematical Education, Modeling, and other aspects of Mathematics Education to pedagogical practice.

Such points, which evidently do not exhaust the debate and reflection on the practices-policies-research on mathematics curricula, are intended, instead, to support other possibilities for understanding and valuing the work that takes place on the "school floor", by teachers and mathematics teachers committed to a non-technical, critical, emancipatory and democratic education.

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Submitted: Aug. 5 2020.
Accepted Sept. 21 2020.