Contextualization in the area of Mathematics and its technologies of the National Base of Common Curriculum (BNCC): possibilities through Decolonial Pedagogies

Walter Walentino da Cruz¹
Alessandro Tomaz Barbosa²
Tamirys de Souza Rosa³

Abstract: Our purpose with this article is to analyze the meanings of contextualization in the area of Mathematics and its Technology of the BNCC and its normative character. In order to achieve this objective, we rely on a qualitative and documentary research of the final version of the BNCC and the training documents: 1) “Transversal Contemporary Themes (TCTs) in the BNCC: historical context and pedagogical assumptions”; 2) “Transversal Contemporary Themes (TCTs) in the BNCC: proposals for implementation practices”. We also emphasize that the analysis was fostered from a critical discussion based on the precepts of Ethnomathematics and Decolonial Thought. The results show that the contextualization presented in the BNCC directs learning towards a labor qualification, based on the development of competencies, with a normative character that approaches a neoliberal conception and coloniality. We consider that the meanings of the contextualization theme favor the epistemological erasure and the distancing of a critical, emancipatory formation that respects sociocultural diversities.

Keywords: Contextualization. BNCC. Ethnomathematics. Decolonial Thought.

La contextualización en el área de Matemáticas y sus tecnologías del Base Curricular Nacional Común (BNCC): posibilidades através de las Pedagogías Decoloniales

Resumen: Objetivamos con este artículo analizar los sentidos sobre contextualización en el área de la Matemática y sus Tecnologías de la BNCC y su carácter normativo. Para lograr tal objetivo, nos basamos en una investigación cualitativa y documental de la versión final de la BNCC y de los documentos formativos: 1) “Temas Contemporáneos Transversales (TCTs) en la BNCC: contexto histórico y suposiciones pedagógicas” 2) “Temas Contemporáneos Transversales (TCTs) en la BNCC: propuestas de prácticas de implementación”. Destacamos todavía que el análisis ocurrió a partir de una discusión crítica fundamentada en los preceptos de la Etnomatemática y del Pensamiento Decolonial. Los resultados señalan que la contextualización presentada en la BNCC direcciona el aprendizaje para una formación laboral, basado en el desarrollo de competencias, con carácter normativo que se aproxima de una concepción neoliberal y de la colonialidad. Consideramos que los sentidos sobre la temática contextualización favorece el borrar epistemológico y el alejamiento de una formación crítica, emancipatoria y que respeta las diversidades.

¹ Master’s students in Sciences and Mathematics Teaching at Universidade Federal do Norte do Tocantins (UFNT). Professor at the Education Secretariat of the State of Tocantins (Seduc) and Municipal Education Secretariat of Palmas (Semed). Tocantins, Brazil. ☐ walterwalcruz@gmail.com ☐ https://orcid.org/0000-0003-0595-9125.
² Doctor in Scientific and Technological Education. Professor at the Postgraduation Programme in Sciences and Mathematics Teaching at Universidade Federal do Norte do Tocantins (UFNT). Tocantins, Brazil. ☐ alessandrobarbosa@mail.uft.edu.br ☐ https://orcid.org/0000-0002-7252-3009.
³ Graduate student in Biology at Universidade Federal do Norte do Tocantins (UFNT). Tocantins, Brazil. ☐ rosa.tamirys01@gmail.com ☐ https://orcid.org/0000-0001-8754-6433.
socioculturales.

**Palabras clave:** Contextualización. BNCC. Etnomatemática. Pensamiento Decolonial.

**A contextualización na área de Matemática e suas Tecnologias da Base Nacional Comum Curricular (BNCC): possibilidades mediante as Pedagogias Decoloniais**

**Resumo:** Objetivamos com este artigo analisar os sentidos sobre a contextualização na área de Matemática e suas Tecnologias da Base Nacional Comum Curricular (BNCC) e o seu caráter normativo. Para alcançarmos tal objetivo, pautamo-nos em uma pesquisa qualitativa e documental da versão final da BNCC e dos documentos formativos: 1) “Temas Contemporâneos Transversais (TCTs) na BNCC: contexto histórico e pressupostos pedagógicos”; 2) “Temas Contemporâneos Transversais (TCTs) na BNCC: propostas de práticas de implementação”. Destacamos ainda que a análise se deu a partir de uma discussão crítica fundamentada nos preceitos da Etnomatemática e do Pensamento Decolonial. Os resultados sinalizam que a contextualização apresentada na BNCC direciona a aprendizagem para uma formação trabalhista, pautada no desenvolvimento de competências, com caráter normativo que se aproxima de uma concepção neoliberal e da colonialidade. Consideramos que os sentidos sobre a temática contextualização favorece o apagamento epistemológico e o distanciamento de uma formação crítica, emancipatória e que respeita as diversidades socioculturais.

**Palavras-chave:** Contextualização. BNCC. Etnomatemática. Pensamento Decolonial.

## 1 Introduction

One of the concerns in the field of Mathematics Education is about the meanings produced in the process of teaching and learning Mathematics and what are the real meanings that this knowledge produces in the students' social life. This concern makes several scholars mobilize efforts to understand this relationship between everyday life, school knowledge and the didactic-pedagogical paths that need to be followed to align school learning with the students' social and cultural actions.

Within this way of thinking that seeks to prioritize mathematical knowledge making sense in the social context of the learner, the contextualization of theoretical concepts to their social and cultural environment is broadly discussed as an alternative. Costa and Lopes (2018) state that,

**The curriculum debate has long valued contextualizing knowledge.** The insertion of school knowledge in a given context, conceived as the students'
daily lives, as a practice in which (theoretical) knowledge is applied, a space for know-how-to-do, or even as a territory that can give political meaning to what is learned is part of the disputes of meaning aiming to signify what constitutes curriculum (COSTA and LOPES, 2018, p. 302, emphasis added).

To delve deeper into the term contextualization, discussed in Mathematics Education by several authors such as Conceição, Jesus, and Madruga (2018, p. 291), who investigate the way in which “future Mathematics teachers understand the contextualization in the Mathematics teaching process”; Costa and Lopes (2018), who develop a research on the contextualization of knowledge in High School as an attempt to control the other; Justi and Bennemann (2016, p. 1), who investigate the “interest in learning Mathematics awakened in the student when the educator is guided by the perspective of Ethnomathematics contextualization”; Maffi, Prediger, Filho, and Ramos (2019, p. 76), who bring discussions about “the teachers’ perceptions of the contextualization in the learning of Science and Mathematics” —, we bring in this article the contributions of decoloniality, highlighting that such approach will be considered from the criticality of the “West as a privileged locus of enunciation, starting to advocate countless decolonial pedagogies that seek to explain knowledge silenced throughout colonization” (BARBOSA, 2018, p. 61).

Within this environment of political dispute in the curricular field that seeks to give meaning to learning through the school curriculum, there has been, recently, a huge effort on the part of the Education Secretariats and private companies through non-governmental institutions around the implementation of the Base Nacional Comum Curricular (BNCC), which, in its final format released in 2019, is a single, standardized, and normative model, aspects that approach coloniality.

After analyzing the BNCC texts, we observed that the normative document is a reference for elaborating regional curricula so that states, municipalities, and the Federal District are aligned to offer a one and standardized education for all. In this sense, Macedo (2014) highlights that the discussions around the establishment of a national common curriculum base are not new, dating back to the 1980s and passing through the Lei de Diretrizes e Bases — LDB (BRASIL, 1996), which mentions a national base, the result of political pressures and articulations. Later, the idea of a centralized curriculum gained space with the establishment of curriculum guidelines that, in its final version, became the National Curriculum Parameters — PCNs (BRASIL, 1997).
As they do not “meet the demands for centralization of curriculum decisions produced in multiple spaces” (MACEDO, 2014, p. 1533), the PCNs do not have the so-desired normative character, and was taken as non-mandatory curriculum alternatives, encouraging discussions about a comprehensive curriculum that can serve everyone in an “egalitarian” way, whose implementation through contextualization can meet and prepare subjects for the specifics of everyday life in the most diverse regions. We believe that “in this prefixed contexts, multiple unforeseen and singular possibilities of being and deciding are restricted to a given way of being (and deciding) that is supposed to be necessary for a (specific conception of) society, projected by some for all others ” (COSTA and LOPES, 2018, p. 302).

In this way, understanding that the meanings produced behind the idea of contextualization can be multiple and oriented, aiming at the superposition of a hegemonic idea over other ways of being and thinking, we sought to reflect through qualitative approach research about contextualization as a way to produce meanings in the teaching-learning process in the area of Mathematics and its Technologies of the BNCC. Therefore, the following questions guided us: 1 — What are the meanings of contextualization in Mathematics and its Technologies produced from the ideas contained in the BNCC? 2 — Is it possible, from the BNCC, with an imposing character, to implement teaching-learning processes based on decolonial precepts that aim at an emancipatory and liberating education? Thus, this article aims to analyze the meanings of contextualization in the Mathematics and its Technologies of the BNCC and its normative character. To achieve this objective and answer the questions, we will start from a documentary research, analyzing the normative character of the BNCC and how the term *contextualization* is presented in the documents: 1) Temas Contemporâneos Transversais (TCTs) na BNCC: contexto histórico e pressupostos pedagógicos [Transversal Contemporary Themes (TCTs) in the BNCC: historical context and pedagogical assumptions]; 2) Temas Contemporâneos Transversais (TCTs) na BNCC: propostas de práticas de implementação [Transversal Contemporary Themes (TCTs) in the BNCC: proposals for implementation practices].

This work is structured in five sections. First, this introduction. Next, section “Theoretical and methodological aspects of the research" brings the analysis of the
documents and the theoretical-methodological framework of Decoloniality and Ethnomathematics. In the following section, “BNCC: imposition and contradictions”, we argue the normative character of this document, which tends to offer education focused on work, meeting precepts that favor ideas of the capitalist market. Section four, “Transversal contemporary themes of the BNCC: contextualization”, discusses the meanings of contextualization in the area of Mathematics and its Technologies of the BNCC. Finally, we present some considerations about the research and the possibility of incorporating Ethnomathematics and Decolonial Thought as alternatives in the process of transgression to the Coloniality of Knowledge.

2 Theoretical and methodological aspects of the research

Human beings are social beings, therefore, they carry preconceptions such as beliefs, ideologies, and social and cultural values. They influence and are influenced by their environment, acting directly in the processes of transforming reality as a political being. “The subject is incapable of just describing, portraying the object, as if it were a mere photograph” (DEMO, 2011, p. 28, author’s emphasis).

Within this context, science has a fundamental role. It cannot be dissociated from human life, as if it were disconnected from everything and did not contribute or be responsible for a large part of social and cultural changes and hegemonic domination processes.

In recent years, the way science is seen has changed significantly. This is specifically true for Human Sciences, an area that has been acting from a new perspective, beginning to develop studies grounded on other locations in the Global South. In other words, researchers in the area halted acting solely and exclusively based on Human Sciences springing from the Global North, which, until then, had sought to understand social relations based on statistical quantifications, based on a supposedly scientific neutral discourse. This way of thinking prevailed for a long time as the only way to develop science, which, today, began to be perceived as a possible way to see reality. Given the above, many questions arose: Which role does science play? To whom does it serve? To what does it serve? How viable is the process of scientific neutrality to which it was subjected? These questions were and are emerging according to the concerns inherent to the human being.

For years, the neutrality of science has been used for domination and social
control; in this way, we observe that the neutral science discourse had a specific function: to maintain a hegemonic group in power. Thus, one must take sides and start to define what is the social function of science, acting as a political being capable of producing a transforming science, putting it at the service of society, and changing reality in a significant, fair, and egalitarian way: “the construction of science is a social phenomenon par excellence” (LÜDKE and ANDRÉ, 1986, p. 2).

In this way, within the scientific investigation, the researcher is placed as the protagonist of the process of transformation of science and society, since the object of study is something perceived, it is part of a scientist’s observation and, thus, the object of study is taken as the researcher see it at a specific time and place. The object is constructed by an observer endowed with social, political, cultural, and ideological values, which makes them unable to describe or portray it as it truly is. For Lüdke and André (1986), it is impossible to separate the researchers and the objects of study. Researchers are not in a position of neutrality because they carry with them phenomena of knowledge and the consequences of their direct participation.

Therefore, we will always be guided by conceptual lenses, seeking to step on appropriate methodologies to minimize interference and bring the object/reality closer. Hence, we follow the thinking of Lüdke and André (1986), when they emphasize that, in the research process, “it is necessary to promote the confrontation between data, evidence, information collected on a given subject, and theoretical knowledge about it” (LÜDKE and ANDRÉ, 1986, p. 1).

In this perspective, to answer our questions and achieve our objectives, we based the research methodology on a qualitative approach which, for Minayo (2002), seeks answers to non-quantifiable particular questions: “it works with the universe of meanings, motivations, aspirations, beliefs, values, and attitudes” (MINAYO, 2002, p. 21-22), in such a way that there is a greater depth between the relationships, processes, and social phenomena that cannot be reduced to the operationalization of variables. Therefore, the very nature of the theoretical and methodological framework leads us to this type of research, as it addresses sociological aspects and social behaviors.

We understand that to construct an investigative study, we must adopt numerous methodological procedures to get answers to the research questions and achieve the objectives proposed. We also recognize that we must consider that we are
inserted in a social environment that affects us and is also affected by our actions, both temporally and locally. In this way, we emphasize that we delimited our research in a post-Covid-19 pandemic period, between March and April 2022. We claim that the final version of the BNCC was released in 2019, including the High School Curriculum Base, and the qualification courses for its implementation were held remotely during the Covid-19 pandemic, in parallel with the adaptations that the education system had to make to serve the students and minimize the educational losses caused by the suspension of school activities due to the health emergency of the disease.

We point out that we used documentary research to obtain the data for the studies. According to Gil (2008), this approach is somewhat similar to bibliographic research, differing in terms of the nature of the sources. Bibliographic research is based on contributions from many authors on a given subject, while “documentary research uses materials that have not yet received an analytical treatment, or that can still be reworked according to the research objectives” (Gil, 2008, p. 51), configuring the best strategy for the development of our studies.

Seeking a deeper understanding of the topic addressed, we adopted Decoloniality and Ethnomathematics as a theoretical-methodological framework. As for Decoloniality, we are guided by authors who seek to discuss education from the Global South and the coloniality process to which we are subjected (Barbosa and Cassiani, 2019; Gomes, 2019; Oliveira, 2016; Tamayo-Osório, 2017 and Walsh, 2009). Concerning Ethnomathematics, we base our work on authors who discuss Eurocentric Mathematics as a strengthening of Eurocentric hegemonic ideas, the existence of other mathematics, the erasure of epistemic diversities, and the strengthening of each people’s cultural roots and knowledge (D’Ambrosio, 2009; Fernández, 2006; Freitas and Fantinato, 2021; Halmenshlager, 2006 and Knijnik, 2006). Finally, we are also guided by Freire (1996) regarding liberating and emancipatory education. We refer to these authors because of their significance and contributions to the field of curriculum, strengthening political discussions, democratization, and curriculum decolonization, given that the school curriculum has served as a means of strengthening and imposing an only and hegemonic culture: the European.

In this sense, interviewed by Cláudio Fernando da Costa (2021) at the UFF Ethnomathematics Group (GETUFF), D’Ambrosio says that the colonial interest from
1500 onwards was not only in production as before but also in catechesis. Those interests began to intervene in the daily practices and values of the colonized groups, repressing their language, scientific knowledge, daily practices, and native values, imposition the colonizer’s culture.

In view of this, we observe that the BNCC, due to its marketing character and predominance of the idea of uniqueness of knowledge, contributes to the maintenance of the capitalist ideal, since:

It is in this sense, to prepare for the job market and to disseminate neoliberal ideas that people involved in education have sought to implement the development of competencies and abilities, first by elaborating the Parâmetros Curriculares Nacionais (PCNs) in the 1990s, and today, with the implementation of the BNCC (BRANCO; BRANCO; IWASSE and ZANATTA, 2019, p. 158).

So, we perceive that the BNCC seeks to meet the demands of the market with the formation of qualified labor added to the European scientific model by arguing that the school must be structured to:

- ensure knowledge contextualization, articulating the dimensions of work, science, technology, and culture;
- enable students’ access to the scientific and technological bases of production processes in the contemporary world, relating theory and practice –or theoretical knowledge and solving problems of the social, cultural, or natural reality;
- reveal the contexts in which different forms of production and work occur, its constant modification and updating in contemporary societies and, in particular, in Brazil;
- provide a culture that favors the development of attitudes, skills, and values that promote entrepreneurship (creativity, innovation, organization, planning, leadership, collaboration, a vision of the future, risk-taking, resilience, and scientific curiosity, among others), understood as an essential competence for personal development, active citizenship, social inclusion, and the employability; and
- provide support for young people so that they recognize their potential and vocations, identify perspectives and possibilities, build aspirations and goals for training and professional insertion present and/or future, and develop an entrepreneurial, ethical, and responsible attitude to move in the world of work and society in general (BRASIL, 2017, p. 466, emphasis added).

So, we observe that the BNCC strengthens the process of modern colonization, since it directs education to meet the demands of the capitalist market by establishing an only and universal form of knowledge for all, disregarding sociocultural diversities of the different spaces and time, intervening significantly in the way of life of the ex-
colonized, which consolidates a process of cultural erasure by imposing an only way of life. Within this context, D’Ambrósio (2021) highlights that we live in a period of colonization of the mind since we are all subjected to the same European thought, established within what he calls the “dynamics of cultural encounters” (p. 7), acting under the most harmful aspect, in which a group imposes its system of knowledge and behavior on the other to eliminate the other.

On the national scene, one of the ways to maintain epistemic dominance and the superposition of a particular thought over the other is centered on the control of the school environment, so that education follows the path given by curricula guided by the BNCC and training itineraries, understanding that:

In Brazil, the expression “training itinerary” has traditionally been used in the context of professional education in reference to how professional education systems are organized or even to the forms of access to professions. However, in Law N. 13.415/17, the expression was used in reference to academic education itineraries, which presupposes a deepening in one or more curricular areas, and also to professional technical education itineraries (BRASIL, 2017, p. 468).

Thus, the normative character of the BNCC imposes a mode of education that seeks to meet the market demands imposed by the European worldview, which had as one of its foundations the means of production and the universalization of mathematical knowledge. In this way, we see that from the imposition of a market-oriented education, and strengthened by the idea of an only and universal Mathematics, Western educational institutions have a function of epistemological and colonialist domination, given that such institutions are strongly linked to the capitalist and productive hegemonic system, tending to subordinate other forms of knowledge.

In this direction, Halmenshlager (2006) argues that educational institutions collaborate with the idea of more evolved and superior groups and consider that by

[...] valuing a specific culture in the face of an ethically heterogeneous society implies conceiving that other social developments are inferior and artificial, which favors the marginalization of the oppressed class and ethnic identities (HALMENSLAGER, 2006, p. 277).

Therefore, we need new educational practices given the cultural diversities existing in our country and the erasure of knowledge that has prevailed for several years. D’Ambrosio (2009) states that, nowadays, that perverse and unique practice in which the knowledge of the dominant group (whites) is exalted and imposed and other
knowledge is discarded is no longer suitable. We need a new educational posture, capable of working with multiple cultural knowledge without imposing or superimposing one practice on another.

Within this perspective, Knijnik (2006) points out that one of the great challenges for Mathematics Education from the perspective of Ethnomathematics is to establish connections between popular and academic knowledge.

This exercise of mathematically dealing with the “real” situation, with all its complexity, its (dis)ordering, with the presence of data that, despite being an important part of the problem, are not always necessary for calculations, constituted a moment privileged area of research (KNIJNIK, 2006, p. 225).

Thus, we observe that within the current 21st-century scenario, in which Mathematics is used as a tool of exclusion, we need a new vision of Mathematics Education. Fernández (2006) says that the exclusion caused by the idea of an only mathematics that has been overlapping the “mathematics” of other peoples over the years disqualifies those who do not master it. This exclusion does not recognize the ineffectiveness of Western mathematics for the demands of such peoples because it “is the belief that this only mathematics, more or less developed according to times and places, does not correspond to the world view of some tribes, but is timeless and universal” (FERNÁNDEZ, 2006, p. 134-135). Therefore, it is necessary to start from perspectives that recognize and strengthen the various mathematics developed in the most diverse cultures and consider critical interculturality, proposing a fairer and exclusion-free model of society.

Starting from decolonial thinking, Barbosa and Cassiani (2019) criticize the homogenization of curricula noticed through curricular transnationalization. This is observed through the “transfer” of some knowledge and curriculum models designed for a given reality to another society, without considering local knowledge and historical, political, cultural, and economic specificities, without dialogue with the context and local knowledge.

In dialogue with decolonial studies, D’Ambrosio (2009) argues that the decolonization process is incomplete in a rootless society. In this sense,

---

5 The critical interculturality that we highlight refers to the concept presented by Walsh, which consists of a way of questioning the current model of society, in such a way that it problematizes the structural-colonial-racial issue and the link with market capitalism, aiming at a social reformulation, mainly through decolonizing practices. In this way, it focuses on the need to transgress, interrupt, and dismantle the colonial matrix based on people who suffer a history of submission and subalternization.
Ethnomathematics has as one of its main pillars the recognition and strengthening of these cultural roots. Thus, Fernández (2006) proposes an inversion of the look at Mathematics, so that: “What if, instead of looking at popular practices from ‘mathematics’, we look at mathematics from the point of view of popular practices?” (FERNÁNDEZ, 2006, p. 125), seeking to re-signify the educational process by strengthening traditional knowledge and valuing other forms of knowledge.

3 The BNCC: imposition and contradictions

Seeking curriculum centralization, several actors began to discuss the BNCC, mainly neoliberal groups driven by the educational reforms that came with the World Bank’s proposals. Macedo (2014) also highlights the pressure imposed by the Economic Blocs and the various foundations and private groups that sought to aggregate their demands to maintain control over the curriculum, a phenomenon characterized by some authors as the “commodification of education”.

The author emphasizes that even though education has taken on a social character through public policies, the discussion of curriculum standardization was resumed in 2009, culminating in the launching of the Diretrizes Curriculares Nacionais (DCN) in 2010, and finalized by the Plano Nacional de Educação (PNE) in 2014, releasing that same year the consultations for the definition of the BNCC, partially ratified in 2017 as a norm, as the text argues:

The Base Nacional Comum Curricular (BNCC) is a normative document that defines the organic and progressive set of essential learnings that all students must develop throughout the stages and modalities of Basic Education so that their learning and development rights are assured, as per the provisions of the Plano Nacional de Educação (PNE) (BRASIL, 2017, p. 7, emphasis added).

The normative character of the BNCC presents itself to education networks and teachers from a colonial perspective, since one of the characteristics of coloniality is based on its imposing power, in such a way that:

[...] coloniality is the result of an imposition of colonial power and domination that manages to reach the subjective structures of a people, penetrating their concept of subject and extending to society in such a way that its ties persist even after the end of the colonial rule (GOMES, 2019, p. 227).

In this scenario of coloniality, it is up to educational institutions and teachers to adapt so that the proposal is adequate and implemented. Thus, “at the extreme of
arrogance, malevolent reason can produce what does not exist as an image of reality, in the form of arrogant, authoritarian, resentful, and epistemicide ignorance, which feeds on hatred and the annihilation of difference” (SÜSSEKIND, 2019, p. 95-96). The author argues that the way the BNCC is being placed demonstrates the invisibility of human knowledge, based on the unquestionable domain of European reason and the disrespect for human experiences, a fact that sustains the hegemony of the Global North and significantly affects school curricula.

The ideas underpinning this standardized educational thinking revolve around the development of skills and abilities. “Throughout Basic Education, the essential learning defined in the BNCC must compete to ensure students the development of ten general competencies, which embody, in the pedagogical scope, the rights of learning and development” (BRASIL, 2017, p. 8). In this sense, Marilena Chauí (2012) highlights that the ideology of competencies is based on the assumption of knowledge as an indicator of the current social hierarchy. Thus, for this form of modern ideological thinking, those who have technical and theoretical “knowledge” command, and those who do not, obey. Felipe, Silva, and Costa (2021) argue that educational thinking leads to qualification for the labor market detached from a critical and emancipatory education:

[...] the BNCC is based on an educational project for employability qualification, with the centrality of competencies, from a directed, prescriptive teaching model linked to an efficient evaluation model, inspired by behavioral theories; [moreover], the propositions of the BNCC distance themselves from an educational project that aims at a critical and emancipatory formation, when training for work according to neoliberal demands (FELIPE; SILVA and COSTA, 2021, p. 783).

Within this educational model proposed by the BNCC, schools and teachers occupy a prominent place in students’ education. On the one hand, there is a normative document leading to a mercantilist and segregating education; on the other, to the awareness of its social function in the process of transformation and emancipation, so that:

[...] the school lives a contradiction: on the one hand, it reproduces the fundamental contradiction of capitalism -the division of society into antagonistic classes- in its specific objectives of providing this society with an educational project influenced by the bourgeois interests of forming individuals with skills to compete for a place in the job market and submit to the intensification and precariousness of work; on the other hand, it can provide the necessary elements for a critical understanding of this reality and its transformation (FELIPE; SILVA and COSTA, 2021, p. 783).
Thus, there is a conflict of interests, so the curriculum configures a space of epistemological, political, and social ideological dispute, causing each side to develop the necessary strategies for the progress of their educational projects. In this context, the State offers qualifications to school leaders and teachers, aligning them with its project of domination and:

[...] in this dispute for systematized knowledge, there is a question related to state hegemony on the choices related to “how much”, “when”, “what” and “how” to teach, translating into disputes regarding the curriculum, which are concretely presented in the form of selection, organization, and classification of teaching content, as well as pedagogical practices for the implementation of such decisions (FELIPE; SILVA and COSTA, 2021, p. 783).

In this sense, Tamayo-Osório (2017) points out that it is necessary to rethink, discuss, and deconstruct **therapeutically** the images that were built around Mathematics from the European point of view and that, over the years, strengthened and maintained the coloniality of knowledge, legitimizing an epistemic domination that is strengthened within the school environment and curricular organization. So:

[...] we see the school as a space of struggle, resistance, and hybridizations of forms of life and game language, producing and breeding space of images that keep us trapped. Space that feeds one-sided diets. Local school that has much spoken and kept silent, we write it and sometimes it is not us (TAMAYO-OSÓRIO, 2017, p. 43, emphasis added by the author)

For the author, unfolding could break with several categories thought of as “universal” to study and question not only the experiences, identities, and historical relationships that are based on the imposition of an ethnic-racial classification of the colonized world population, but, at the same time, question the “one-sided diet” of images about Mathematics at school.

The imposing and contradictory character can be observed when the BNCC proposes a flexibilization of the curricular organization through the qualification itineraries but maintains the colonialist bases, since it requires that such itineraries be “structured with a focus on an area of knowledge, in technical and professional qualification or, also, in the mobilization of competencies and abilities from different areas” (BRASIL, 2017, p. 477), being subject to the terms of the National Diretrizes Curriculares Nacionais para o Ensino Médio — DCNEM (BRASIL, 2018), whose understanding of Mathematics and its Technologies revolves around:
[...] deepening of structuring knowledge for the **application of different mathematical concepts in social and work contexts**, structuring curricular arrangements that allow studies in problem solving and complex, functional, and non-linear analyses, analysis of statistical data and probability, geometry and topology, robotics, automation, artificial intelligence, programming, digital games, and dynamic systems, among others, considering the local context and the possibilities offered by the education systems (BRASIL, 2017, p. 477, emphasis added).

In the excerpt above, the presence of coloniality can be observed when considering social contexts from the point of view of mathematical concepts, not the other way around. Failing to value regional social experiences culturally constructed over the years, adopting a more “evolved” and unique model, the European superimposes one culture on another. The idea of the efficiency of a given culture implies that from there, it becomes easier to solve all — or almost all — of society’s problems that involve Mathematics; however, it does not make it clear that cultural diversities and the real needs of different groups are being disdained and marginalized.

4 **Transversal contemporary themes of the BNCC: contextualization**

Within this qualification/domination environment presented in the previous topic are the documents:

- **Temas Contemporâneos Transversais na BNCC: contexto histórico e pressupostos pedagógicos** [Contemporary transversal themes in the BNCC: historical context and pedagogical assumptions]

- **Temas Contemporâneos Transversais na BNCC: propostas de práticas de implementação** [Transversal contemporary themes in the BNCC: proposals for implementation practices].

Its main objective is to trace the didactic-pedagogical paths for the contextualization of competencies and abilities to sociocultural contexts. The TCTs (BRASIL, 2019, p. 4) highlight that “it is necessary to overcome the forms of fragmentation of the pedagogical process in which the contents do not relate, do not integrate, and do not interact”. However, we must consider that knowledge is generated in different spaces and periods, so the logic that serves a specific community may be ineffective for another. In this way, Leite and Camargos (2021, p. 11) understand that “mathematical knowledge originated and situated in different sociocultural contexts are based on different logical systems that, necessarily, do not identify with the particular Eurocentric and hegemonic logical system established from
modernity through coloniality”.

The establishment of the Eurocentric view of hegemonic knowledge that seeks to maintain the epistemological domain through school curricula made the BNCC assume a character of qualification for the market to meet the demands of “modernity”. About this Eurocentric and marketing vision of the BNCC on the teaching-learning process,

the Transversal Contemporary Themes can explain the link between the different curriculum components in an integrated way, as well as make their connection with situations experienced by students in their realities, contributing to bringing context and contemporaneity to the objects of knowledge described in the BNCC (BRASIL, 2019, p. 5).

In this way, we observe that the TCTs are placed as integrators between Eurocentric know-hows and knowledge and those developed by the most diverse communities. However, they do not consider that “there is, in fact, an impossibility of bijective mappings between sets of socioculturally distinct mathematical knowledge, such as the Indigenous and Eurocentric knowledge” (LEITE and CAMARGOS, 2021, p. 14).

In the search for the intertwining of Eurocentric knowledge and traditional knowledge to direct them in a single direction — of European knowledge — the “TCTs — Propostas de Práticas de Implementação” [TCTs — proposals for implementation practices] is presented as a BNCC implementation guideline in a contextualized way, placing the teacher only as a mere content applier.

The crossing proposals present in the Models, Modules, and Projects below seek to meet the demand of the contextualization, deepening, and unfolding that is expected with the insertion of the Transversal Contemporary Themes (TCTs) in the spheres of pedagogical work and learning of the BNCC (BRASIL, 2019, p. 11, emphasis added).

In Chart 1, we present the TCTs understandings and what they advise teachers should do, such as the “Cruzamento entre Componentes Curriculares e TCTs — Interdisciplinaridade no Currículo” [Crossing between curriculum components and TCTs — interdisciplinary in the curriculum] (BRASIL, 2019, p. 13).

<table>
<thead>
<tr>
<th>Chart 1: Crossing between Skills and TCTs — Intradisciplinarity in the Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Science 1st grade of Elementary School</strong></td>
</tr>
<tr>
<td>Thematic units - The Earth and the Universe</td>
</tr>
<tr>
<td>Objects of Knowledge - Relationship between the succession of days and the rhythm of the</td>
</tr>
</tbody>
</table>
activities of living beings

### BNCC Skills and Interdisciplinary

**(EF01CI06/ES)** To establish relationships between the succession of days and nights and the life cycle and daily activities of living beings, including humans, selecting examples from their daily lives and their local reality. Opportunity for interdisciplinary work with the skills of the curricular components: History.

**(EF01HI01/ES)** To identify aspects of their growth through recording private memories or memories of their family members and/or their community, understanding and awakening memories through images, iconography, photographs and videos, changes and permanences that involve their growth and of the other. To recognize through visual resources singularities of behavior, identity, and belonging to their families and community.

**(EF01HI02/ES)** To identify the relationship between students’ stories and the stories of their families and communities, and recognize themselves as part of a social group with its specificities and diverse circumstances.

### Contextualized Practices with TCTs

**S&T** — To understand fundamental concepts and explanatory structures of the natural sciences, as well as know scientific research processes, practices, and procedures, to feel confident in the debate of issues of scientific, technological, socio-environmental and the world of work, continue learning and collaborate for the construction of a fair, democratic, and inclusive society.

**Tr** — To evaluate applications and political, socio-environmental, and cultural implications of science and its technologies to propose alternatives to the challenges of the contemporary world, including those related to the world of work.

Source: TCTs (BRASIL, 2019, p. 12).

Sharing Freire’s ideas (1996, p. 69) when he argues that “every educational practice demands the existence of subjects, one who, when teaching, learns, and another who, when learning, teaches”, we are aware that in the teaching/learning path, the educator is not only inserted as a mere applier of content, in order to implement and put into practice ideas contained in curriculum documents constructed unilaterally, nor the students as a mere receivers, but as political agents capable of transforming the space and the conditions to which they are subjected. In this sense, Freire (1996) argues that:

> Women and men, we are the only beings that, socially and historically, have become capable of **cognizing**. Therefore, we are the only ones who find **learning** a creative adventure, something, therefore, much richer than merely repeating the **lesson given**. Learning for us is **constructing**, **reconstructing**, **verifying to change**, which cannot be done without being open to the risk and adventure of the spirit (FREIRE, 1996, p. 69, author’s emphasis).

And in this process of construction and reconstruction, we understand that the Program Ethnomathematics is consolidated as an instrument of cultural and social resistance, demystifying the idea of the existence of only one way of doing mathematics, the European way, which has been imposed over the centuries and which purpose is to favor a specific hegemonic group over another, devaluing any form of knowledge other than the established one. In this way, we understand that “there
are many ways of conceiving Ethnomathematics, all essentially recognizing ways of doing and knowing mathematics in culturally differentiated groups" (COSTA, 2021, p. 6).

Thus, when we assume the position of progressive educators, we must be aware of our role in student education, since:

 [...] the existence of objects, contents to be taught and learned, involves the use of methods, techniques, materials; implies depending on its directive character, objects, dreams, utopias, ideals. Hence its political nature, the quality of the educational practice of being political, of not being neutral (FREIRE, 1996, p. 70, emphasis added).

In this path of political non-neutrality of educators, their participation is of paramount importance not only in the implementation of the BNCC, but also in the production of that document, since, in the current format, we understand that:

The BNCC and the policies related to the document imply significant changes in the school, such as: curriculum narrowing; designing a curriculum to shape worker qualification; strengthening inequalities through assessments; threat to the teacher’s autonomy (control of his/her work, seen as a mere performer of tasks); teacher education according to the hegemonic “logic”; opening for privatization (production of teaching material by private companies); accountability (FELIPE; SILVA and COSTA, 2021, p. 299).

From this perspective, it is necessary that teachers and the communities involved have more democratic and effective participation in the formulation of curriculum guidelines so that their voices are heard, considered, and validated in regional and national proposals. We emphasize, however, that the absence of contributions from educators and different cultural groups in the curricular documents is not due to teachers’ inertia or a lack of participation in the discussions, but due to the silencing of voices, given that:

 [...] the state Seminars in no way guarantee that the educators’ criticisms and suggestions will be considered. Those who govern have the power to define the problems and formulate the issues, establishing what is important to be done and said and, thus, the teachers’ freedom of expression is exercised within the limits of a previously codified doing and saying, already established by the problems and solutions of those who govern (CARVALHO and LOURENÇO, 2018, p. 242-243).

The authors argue that there is a disqualification of the knowledge of teachers working in Basic Education and of community members, “lay people” confronted with the knowledge of the experts and “objective and universal” specialists, in such a way
Experts question unauthorized or so-considered illegitimate voices, in a game between the agencying that “does” and the agencying that “knows” and “decides”. In this game, there is still, apparently, a stimulus to the participation of “lay people” with the purpose of, by making them speak, legitimizing the discourse of experts (specialists, media, researchers in different areas of knowledge) and, under apparent participation, keep them under consultation without effective decision-making power (CARVALHO and LOURENÇO, 2018, p. 241).

Thus, the colonizing format that the BNCC presents and the lack of representation in its text will certainly lead educational spaces to environments of conflict and resistance, since the proposals, which contemplate only the interests of specific groups linked to the market, despise regional social and cultural needs and values, strengthening the Coloniality of Knowledge, Being, and Power by erasing other cultures.

Chart 1 shows an emphasis on education aimed at the world of work, as we can see in the following two excerpts: 1) “practices and procedures of scientific investigation, in order to feel safe in the debate of scientific, technological, and socio-environmental issues and issues from the world of work [...]” (BRASIL, 2019, p. 12, emphasis added); “2) [...] including those relating to the world of work (BRASIL, 2019, p. 12, emphasis added).

Oliveira (2016) argues that the current school model is based on the “absolutization of formal knowledge as the only form of knowledge and on the belief that it is up to schooling to ‘elevate’ the student from ‘popular culture’ to high culture” (OLIVEIRA, 2016, p. 43). Such an education model turns to the ideals of capitalist modernity, whose founding bases act to subordinate epistemological diversities, universalizing “particularisms committed to the capitalist project of progress through unlimited development, made possible due to the improvement of productivity and expansion of accumulation” (OLIVEIRA, 2016, p. 43).

In this sense, we observe strong tendencies towards mercantile formation in the educational documents since the proposed education model revolves around the qualification of the workforce by controlling the school pedagogical process.

We clarify that we do not deny the subjects’ rights to qualification to work in different work spaces, conquered with much struggle. Nevertheless, we want to reinforce the importance of critical, emancipatory, and decolonial formative processes,
also aimed at social well-being.

Chart 1 also shows the following excerpt: “S&T — Understand fundamental concepts and explanatory structures of the natural sciences” (BRASIL, 2019, p. 12, emphasis added). We interpret that the fundamental concepts for the maintenance of modern science as the only holder of knowledge, the systematized knowledge, take strength with the current BNCC document in such a way that they present and consider them as fundamental for the understanding of Natural Sciences, making invisible and excluding other ways of knowing the world. For Oliveira (2016):

This process of excluding forms of non-scientific knowledge was present in the process of European expansion, which includes many “epistemicides”, i.e., annihilation or subalternization, subordination, marginalization, and illegalization of practices and social groups that carry “strange” forms of knowledge” because they are supported by threatening social practices (OLIVEIRA, 2016, p. 17).

In view of this, we reinforce a stance of political and epistemological non-neutrality on the part of the educator to enable the “de-invisibility of non-model school/educational practices/existences, identifying them and seeking to free them from the place of inexistence and inferiority to which they are being relegated” (OLIVEIRA, 2016, p. 43) for not agreeing with the scientific rigor imposed by “modernity”.

Thus, we understand that new attitudes in the educational field are needed to provide further visibility to the “singularities and alternative ways of being in the world, understanding it, feeling it present in them, which are constitutive of knowledge networks within which curricula are created” (OLIVEIRA, 2016, p. 43). These are essential factors for reconstructing an emancipatory educational project that considers the educational space as political and epistemological, which discusses both the relationships between the socio/culturally knowledge produced and the role of the school in the libertarian project.

From this perspective, knowledge and scientific development in the context of European modernity have always had well-defined places and purposes within society: to maintain the status of the superiority of the European colonizer (white) to the detriment and subalternization of the colonized (different), a context strengthened by the idea of unique and superior knowledge -Eurocentric knowledge- that takes shape from the domination of the other through the Coloniality of Power, Knowledge, Being,
and Nature. This system of colonial domination operates differently from before the 1500s, when the countries searched for products of interest to the colonizer without intervening in the sociocultural modes of the colonized.

In this sense, Ethnomathematics admits and proposes a curricular discussion, aiming to make possible an education that “seeks for a human formation integrated to the different dimensions of life, with this educational project effectively committed to overcoming social inequalities and injustices” (FREITAS and FANTINATO, 2021, p. 6), in contrast to traditional curricula that consider as learning objects only pre-established content that devalues diversities and strengthens the European hegemonic mode of knowledge, which has always been taken as a reference and as the basis of truth.

In this article, attention is drawn to the topic “Práticas Contextualizadas com TCTs” [Contextualized Practices with TCTs] (BRASIL, 2019, p. 12, emphasis added), in which ways to operationalize the skills present in the BNCC are presented. Thus, we ask: Is it possible to implement teaching methodologies based on principles of Ethnomathematics and Decolonial Thought that allow transforming the contextualization of the BNCC into practice?

We realize that the imposing and centralizing character of the BNCC leads the educational process to Eurocentric bases in such a way that for the development of alternative means of teaching that direct education to other epistemic bases, it is only possible to take advantage of the cracks in the Curricular Base and, as Freire (1996) points out, the educator’s transgressiveness.

In this perspective, D’Ambrosio (2009) highlights a need to contextualize Mathematics so that the passage from the concrete to the abstract can be understood. Mathematics has always been linked to everyday practices; however, from the moment it gains notoriety and starts to be considered synonymous with rationality and intelligence and serves as an instrument of domination, the concepts begin to overlap the practices, and its domain becomes a class divider: those who dominate it are part of the dominators, and those who do not dominate it are part of the dominated, the subaltern, incapable and culturally inferior.

---

7 According to Walsh (2009), the coloniality of power is structured on the idea of race and capitalist development, based on the Coloniality of Being and Knowledge, in which: the basis of the Coloniality of Being is in the classification of peoples into superiors and inferiors, human and non-human, rational and irrational, more evolved and less evolved; while the coloniality of knowledge is dominated by the Eurocentric hegemony as the sole holder of knowledge, the idea of a single science and the coloniality of mother nature focuses on the binary difference between mammal, categorized as primitive, not modern.
5 Final Considerations

Throughout the research, we observed that the issues pointed out here presenting the potential of Ethnomathematics, added to the contributions of Decoloniality to Mathematics Teaching, are not contemplated in the current document of the Base Nacional Comum Curricular (BNCC), nor in the documents suggested for the education of teachers that deal with the implementation of the Base, namely:

- Temas Contemporâneos Transversais na BNCC: contexto histórico e pressupostos pedagógicos [Contemporary transversal themes in the BNCC: historical context and pedagogical assumptions]
- Temas Contemporâneos Transversais na BNCC: propostas de práticas de implementação [Transversal contemporary themes in the BNCC: proposals for implementation practices].

We reached such a conclusion after studying the latest version of the BNCC and the documents mentioned above, available on the website of the Ministério da Educação (MEC). We found that neither Ethnomathematics nor Decolonial Thought is mentioned, configuring an erasure of the Parâmetros Curriculares Nacionais (PCNs), which consider Ethnomathematics as a connection between Mathematics and Cultural Plurality, in such a way that “Ethnomathematics seeks to understand reality and arrive at pedagogical action naturally through a cognitive approach with a strong cultural foundation” (PCN, 1998, p. 33), in which the study of the History of Mathematics and Ethnomathematics are potentializers for the understanding of the production of historically and socially constructed knowledge.

In this way, understanding that the intertwining between the two approaches is valuable for the recognition and strengthening of the cultural roots that are the basis of support of a people, we reinforce the approximations of Ethnomathematics and Decolonial Thought in the educational process, since both seek to problematize the various forms of coloniality that were formed from the domination and subalternization of the (colonized) Global South by the (colonizing) Global North, strengthened by the idea of modernity. This proposal is more focused on the Coloniality of Knowledge, instigating discussions and pointing out questions about implementing an only and universal way of knowing that subordinates and erases the epistemic diversities

produced by the most varied cultural groups. This investigation also seeks to discuss the images constructed of mathematical thinking and development within this epistemic domination.

Thus, we move towards a perspective that expresses another way of reading the world and understanding reality, allowing the “de-subalternization” of knowledge and the expansion of decolonial horizons. Together, Decolonial Thought and Ethnomathematics make it possible to create a third space for analyzing and reading the world. It does not mean just mixing the two theoretical aspects but overcoming what each of these perspectives can offer for conducting a teaching-learning process that aims at emancipatory and libertarian education.

References


CARVALHO, J. M.; LOURENÇO, S. G. O silenciamento de professores da Educação


