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Challenges in Implementing the national common curriculum database in mathematics: teacher perceptions and the role of continuing education

Desafíos en la implementación de la base nacional del currículo común en Matemáticas: percepciones docentes y el papel de la formación continua

Défis de la mise en œuvre de la base nationale curriculaire commune en mathématiques : perceptions des enseignants et rôle de la formation continue

Desafios na implementação da base nacional curricular comum em matemática: percepções docentes e o papel da formação continuada

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Abstract

This study investigates teachers' perceptions in the early years of elementary school regarding the implementation of the Base Nacional Comum Curricular (BNCC) in the mathematics curriculum. It seeks to answer the following question: What challenges do teachers face when applying the BNCC in practice, and how can Continuing Education contribute to this process? The research examines the challenges of curriculum standardization and the contributions of Continuing Education. The BNCC, by establishing a prescribed curriculum, aims to structure teaching; however, its implementation faces challenges, as translating guidelines into teaching practice is not a linear process. The gap between the prescribed and the enacted curriculum highlights that the effectiveness of the guidelines depends on teacher mediation and the contextualization of content to meet students' needs. Additionally, curriculum standardization

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raises questions about curricular justice, as a homogeneous model may overlook regional and social diversity, making it difficult to adapt content appropriately. Adopting a qualitative approach, the study gathered data from 16 teachers in the municipality of Bom Retiro do Sul, Rio Grande do Sul, Brazil, through questionnaires administered as part of a Continuing Education program. The data, analyzed through theoretical frameworks on curriculum and Mathematics education, revealed that the BNCC still raises doubts in teaching practice. The findings underscore the importance of Continuing Education as a space for reflection and the development of strategies to make Mathematics education more meaningful and equitable.

Keywords: Mathematics curriculum, Continuing education, Teacher perceptions, Curricular justice, BNCC.

Resumo

O estudo investiga as percepções de professoras dos anos iniciais do Ensino Fundamental sobre a implementação da Base Nacional Comum Curricular (BNCC) no currículo de Matemática, com o objetivo de responder à seguinte questão: quais são os desafios enfrentados pelas docentes para aplicar a BNCC na prática e de que forma a Formação Continuada pode contribuir nesse processo? Consideram-se os desafios da normatização curricular e as contribuições da Formação Continuada. A BNCC, ao estabelecer um currículo prescrito, busca estruturar o ensino, mas sua aplicação enfrenta dificuldades, pois a transposição das diretrizes para a prática docente não ocorre de forma linear. A diferença entre currículo prescrito e currículo real evidencia que a efetivação das diretrizes depende da mediação docente e da contextualização dos conteúdos para atender às necessidades dos estudantes. Além disso, a padronização curricular levanta questionamentos sobre justiça curricular, uma vez que um modelo homogêneo pode desconsiderar diversidades regionais e sociais, dificultando a adaptação dos conteúdos. Com abordagem qualitativa, a pesquisa coletou dados de 16 professoras do município de Bom Retiro do Sul, Rio Grande do Sul, Brasil, por meio de questionários aplicados em uma Formação Continuada. Os dados, analisados à luz de referenciais sobre currículo e ensino de Matemática, demonstraram que a BNCC ainda gera dúvidas na prática docente. Os resultados reforçam a importância da Formação Continuada como espaço de reflexão e de construção de estratégias para tornar o ensino significativo e equitativo na Educação Matemática.

Palavras-chave: Currículo de matemática, Formação continuada, Percepções docentes, Justiça curricular, BNCC.

Resumen

El estudio investiga las percepciones de maestras de los primeros años de la Educación Primaria sobre la implementación de la Base Nacional Común Curricular (BNCC) en el currículo de Matemáticas, con el objetivo de responder a la siguiente cuestión: ¿cuáles son los desafíos que enfrentan las docentes para aplicar la BNCC en la práctica y de qué manera puede contribuir la formación continua en este proceso? Se consideran los desafíos de la normativización curricular y las contribuciones de la formación continua. La BNCC, al establecer un currículo prescrito, pretende estructurar la enseñanza, pero su aplicación presenta dificultades, ya que la transposición de sus directrices a la práctica docente no ocurre de forma lineal. La diferencia entre el currículo prescrito y el currículo real evidencia que la efectividad de dichas directrices depende de la mediación docente y de la contextualización de los contenidos para atender a las necesidades del alumnado. Además, la estandarización curricular plantea interrogantes sobre la justicia curricular, dado que un modelo homogéneo puede ignorar las diversidades regionales y sociales, dificultando la adaptación de los contenidos. Mediante un enfoque cualitativo, la investigación recogió datos de 16 maestras del municipio de Bom Retiro do Sul, en el estado de Rio Grande do Sul (Brasil), a través de cuestionarios aplicados en el marco de una formación continua. Los datos, analizados a la luz de referencias teóricas sobre currículo y enseñanza de las Matemáticas, mostraron que la BNCC sigue generando dudas en la práctica docente. Los resultados refuerzan la importancia de la formación continua como espacio de reflexión y de construcción de estrategias que permitan hacer la enseñanza más significativa y equitativa en la educación matemática.

Palabras clave: Currículo de matemáticas, Formación continua, Percepciones docentes, Justicia curricular, BNCC.

Résumé

L’étude examine les perceptions d’enseignantes du cycle primaire concernant la mise en œuvre de la Base Nationale Commune Curriculaire (BNCC) dans le programme de mathématiques, dans le but de répondre à la question suivante : « Quels sont les défis rencontrés par les enseignantes pour appliquer la BNCC dans la pratique, et de quelle manière la formation continue peut-elle contribuer à ce processus ? » L’analyse prend en compte les défis liés à la normalisation curriculaire ainsi que les apports de la formation continue. En prescrivant un programme commun, la BNCC cherche à structurer l’enseignement, mais sa mise en œuvre se heurte à des difficultés, car la transposition des directives dans la pratique pédagogique ne se

fait pas de manière linéaire. La distinction entre le curriculum prescrit et le curriculum réel met en évidence que l'effectivité des orientations dépend de la médiation de l'enseignant et de la contextualisation des contenus pour répondre aux besoins des élèves. Par ailleurs, la standardisation du curriculum soulève des questions sur la justice curriculaire, dans la mesure où un modèle homogène peut ignorer les diversités régionales et sociales, compliquant ainsi l'adaptation des contenus. Adoptant une approche qualitative, la recherche a recueilli les données de 16 enseignantes de la commune de Bom Retiro do Sul, dans l'État du Rio Grande do Sul, au Brésil, à travers des questionnaires administrés lors d'une formation continue. Les données, analysées à la lumière de références théoriques sur le curriculum et l'enseignement des mathématiques, ont révélé que la BNCC suscite encore des incertitudes dans la pratique pédagogique. Les résultats soulignent l'importance de la formation continue comme espace de réflexion et de construction de stratégies visant à rendre l'enseignement des mathématiques plus significatif et équitable.

Mots-clés : Programme de mathématiques, Formation continue, Perceptions enseignantes, Justice curriculaire, BNCC.

Challenges in Implementing the BNCC in Mathematics: Teacher Perceptions and the Role of Continuing Education

The National Common Curricular Basis (BNCC) is a normative document that establishes guidelines for the organization of school curricula throughout Brazil. By proposing a common foundation for education, it aims to ensure equity and quality in education, structuring the content that should be addressed throughout Basic Education. However, the curriculum cannot be characterized as neutral, as it involves choices about which knowledge will be prioritized and how it will be organized. The curriculum reflects not only pedagogical aspects but also political and cultural interests that shape education, becoming a space of ideological disputes that influence school practices.

From this perspective, the curriculum goes beyond content selection and encompasses political and cultural decisions that directly influence pedagogical practices. For Sacristán (2017), for example, the curriculum reflects a societal project and expresses power relations that materialize in school experiences. Lopes and Macedo (2011), in turn, emphasize that the curriculum should be understood as a discursive and ideological practice, in which different conceptions of knowledge and of the subject compete for legitimacy. This interpretation broadens the understanding of the curriculum as both a regulatory instrument and a space for the production of meaning.

The construction of the curriculum, however, does not occur in a neutral or influence-free manner. It is a social and historical construction, permeated by ideological, political, and cultural disputes that define not only the content to be taught but also the forms of organization and the intentions behind school education.

In this way, the BNCC not only standardizes content but also guides and limits teachers' actions by precisely defining the objects of knowledge, skills, and competencies that must be developed, directly impacting how teaching is planned, conducted, and assessed.

The development of the curriculum in everyday school life, in alignment with the BNCC guidelines, faces significant challenges, especially in Mathematics education in the early years. Although this document clearly establishes the objects of knowledge, skills, and competencies to be developed, its implementation in pedagogical practice is a dynamic process that requires interpretation, mediation, and adaptation by teachers. As Sacristán (2017) points out, the curriculum passes through different levels of realization from what is prescribed to what is implemented, and this trajectory is not linear. Even in the face of regulation, the specific conditions of the school context, teachers' knowledge, and classroom interactions mean that the curriculum in action is necessarily different from the prescribed one. This distinction, however,

does not indicate inefficiency, but rather highlights the complexity and situated nature of pedagogical practice. It therefore becomes essential to understand how teachers interpret and re-signify the guidelines, constructing meaning for the curriculum in real teaching contexts.

In addition, curriculum standardization raises questions about educational justice, since a single model of teaching may overlook regional and social diversities. The homogeneous structure proposed by the BNCC can create difficulties in adapting content to different school realities, limiting teachers' flexibility in lesson planning. In the case of Mathematics in the early years, this issue is evident in the difficulties faced by teachers in adapting the objects of knowledge and skills to their students' needs. The imposition of a rigid curricular structure can exacerbate educational inequalities by failing to consider specific learning conditions, making it essential to reflect on the teacher's role in mediating between standardization and pedagogical practices.

In light of this context, this study investigates the perceptions of early years Elementary School teachers regarding the development of the mathematics curriculum considering the BNCC, identifying the challenges they face and exploring, based on their accounts, what demands and expectations they have regarding the contribution of Continuing Education in this process. The research aimed to understand how teachers interpret and incorporate the guidelines into their practice, as well as to analyze strategies that may support this process.

Therefore, understanding the difficulties faced by teachers becomes essential to support formative actions that improve teaching practice and enable the effective implementation of the curriculum. Thus, this study aims not only to map the challenges posed by the BNCC in Mathematics Education but also to contribute to reflections on the importance of Continuing Education for the improvement of teaching in the early years.

Theoretical Framework

The discussion on curriculum reveals a field of ideological, cultural, and political disputes, since the curriculum is not limited to the selection of content and the way it is organized within the school context. It can be seen as the expression of societal projects, values, conceptions of what constitutes valid knowledge, and expectations regarding the formation of individuals. From this perspective, the curriculum assumes a broader dimension: it is also a social and historical construction, involving decisions about what to teach, to whom, for what purposes, and in which contexts. It articulates knowledge, pedagogical practices, power relations, and processes of inclusion or exclusion, revealing its political and non-neutral nature (Lopes & Macedo, 2011).

Among the different curricular conceptions, the prescribed curriculum stands out, which, according to Sacristán (2017), consists of a set of normative guidelines developed by regulatory bodies with the aim of standardizing teaching and ensuring learning rights for all students. This curricular model seeks to establish a common foundation for education, promoting a certain uniformity among schools. In Brazil, this role is performed by the National Common Curricular Basis (BNCC), a normative document that structures school curricula and defines the competencies and skills to be developed throughout basic education. The BNCC, therefore, represents a regulatory framework that guides pedagogical practices while also imposing challenges to its implementation in everyday school life.

The critique of curricular homogenization and its implications for educational justice is addressed by Ponce and Araújo (2019), who highlight how the imposition of a centralized and prescribed curriculum can reinforce inequalities. According to the authors, the BNCC, by establishing a single set of competencies and skills to be developed by all students, contributes to a model of education that disregards regional and social diversities, resulting in a standardization process that may accentuate educational injustices. Furthermore, this curricular centralization is linked to economic and political interests, hindering the development of a curriculum that takes into account the needs and realities of different school contexts.

From the perspective of Lopes and Macedo (2011), the prescribed curriculum is understood as a text that conveys socially constructed discourses, which produce truth effects on subjects and knowledge. Rather than focusing on an explicit political intentionality, the emphasis is on the ways in which the curriculum regulates and standardizes practices through discourse. For the authors, the definition of what should be taught and the competencies to be developed by students reflects choices that directly impact school dynamics. However, its effective implementation does not occur in a linear fashion, as it depends on teachers' mediation, who interpret and adapt the curricular guidelines to the concrete realities of classrooms. Thus, even though the prescribed curriculum serves to broadly structure education, its materialization in practice reveals tensions and challenges that require critical and contextualized analysis.

Sacristán (2017) deepens this discussion by distinguishing between the prescribed curriculum and the real curriculum—that is, the one that is actually implemented in pedagogical practice. The author argues that although the prescribed curriculum seeks to ensure unity and coherence in teaching, its implementation does not occur automatically, as it is influenced by multiple factors such as teacher training and autonomy, available resources, and the specificities of the school context. In this way, the gap between the prescribed curriculum and the real

curriculum reflects a continuous process of adaptation and re-signification carried out by teachers, who must interpret and adjust the curricular guidelines to make them more aligned with the needs and realities of the students.

In the field of Mathematics Education, this issue becomes even more evident, as the organization of content in the BNCC may conflict with the actual practices and needs of students. Coll (1998) emphasizes that the learning of school content should not be viewed merely as the transmission of a body of knowledge, but as a process in which content must be related to the student's context and prior experiences. In other words, while the prescribed curriculum defines **what to teach**, pedagogical practice and the teacher's mediation determine **how to teach**.

Continuing Education for teachers is an alternative for addressing the complexity between the prescribed curriculum and actual practice. As highlighted by Sacristán (2017) and Lopes and Macedo (2011), teachers must take a leading role in interpreting and adapting the curriculum, transforming normative guidelines into pedagogical actions that truly engage with students' needs. Thus, although the BNCC is an important reference, it should not be seen as a closed and immutable document, but rather as a starting point for reflections and adjustments necessary to meet educational realities.

This discussion on the prescribed curriculum provides a fundamental basis for the analysis of curricular content, as proposed by Coll (1998), by highlighting the need to rethink school content not merely as a set of information to be transmitted, but as interactive elements that must be meaningfully organized for students.

Content and its importance in education have been central themes in various studies on teaching. Libâneo (2012) acknowledges this relevance but draws attention to the fact that teachers need to look beyond the mechanical role of content. It is necessary to reflect on the reciprocal relationship between content, the student, and their role in the teaching and learning process. This understanding of teaching content is insufficient to grasp its true meaning. Content is often perceived as static, preventing students from recognizing any meaning within it. Moreover, this approach underestimates students' abilities, reducing the possibility of developing their capacity to learn. In addition, the teaching of content is often disconnected from students' sociocultural and individual conditions, which negatively affects academic performance (Libâneo, 2012).

Coll (1998) warns of the centrality of content in curriculum discussions, but also points out that, in practice, there has been a tendency to diminish its importance in the classroom. This happens because excessive concern with content can compromise the teaching process, making

it mechanical and meaningless for students. However, this discourse can confuse teachers, since, although content is fundamental to teaching practice, there are criticisms regarding the weight assigned to it. Therefore, a balance is necessary—one that allows content to be taught in a meaningful way, respecting students' conditions and consciously and actively stimulating their mental abilities. In this regard, Libâneo (2012, p. 141) argues that:

> [...] it is not enough to simply select and logically organize content for transmission. Rather, the content itself must include elements from the students' practical experiences in order to make it more meaningful, more vivid, more vital, so that they can assimilate it actively and consciously. At the same time, the mastery of knowledge and skills specifically aims at the development of students' cognitive capacities—that is, of intellectual functions, among which independent and creative thinking stands out.

Rodrigues and Groenwald (2021) complement this perspective by emphasizing that teachers recognize the need to adapt content to students' realities, taking into account learning difficulties and the importance of pedagogical strategies that make sense within the context in which they are applied. This contextualized approach contributes to making content meaningful and promotes students' cognitive development.

In this sense, education should provide opportunities for comprehensive development, and it may be a mistake to adopt a limited view of the role of content in teaching—one that has been criticized for being solely disciplinary and cognitive. It is necessary to adopt a broader perspective on the role of content and to recognize that it can encompass everything essential for full development and for achieving the objectives of each proposed stage. Thus, this discussion is important for teacher education (Zabala, 1998).

By breaking with a rigid view of content, Coll (1998) seeks to overcome this narrow perspective and reflect on the contributions of teachers' knowledge regarding school content. He rejects the transmissive and cumulative interpretation of content and introduces into the debate the different types of content and their functions in learning. In this way, the role of content is considered to be at the service of learning, and not the other way around.

In discussing the importance of school content, the perspective adopted is that of Coll (1998), Libâneo (2012), and Zabala (1998), who view content as a set of knowledge, skills, habits, concepts, explanations, and cultural knowledge pedagogically organized to promote the student's integral development. This set functions as a crucial link between educational objectives and pedagogical practice.

Coll (1998) defines curricular content as a selection of cultural forms or knowledge, including concepts, explanations, reasoning, skills, languages, values, beliefs, feelings,

attitudes, interests, and behavior models. This selection is vital to ensure the proper development and socialization of students within society. Only the essential knowledge and cultural forms should be included in curricular content, and those that require specific support for their full assimilation are incorporated into curricular proposals.

In the study by Rodrigues and Groenwald (2021), teachers recognize the importance of working with essential content but emphasize the need to adapt this content to students' actual learning conditions. This reveals that, although the content proposed by the BNCC is considered appropriate, teachers face challenges in its practical application due to the need to contextualize knowledge and skills in ways that are meaningful and accessible to students.

Libâneo (2012) argues that content mediates the teaching and learning process, reflecting the lived experiences and social practices of humanity. This content is transformed into convictions and criteria to be assimilated and understood by students, guiding them in real-life practices. In the debate on the role of content in teaching practice, it is crucial to consider various types, including skills, data, techniques, and attitudes. Coll (1998) classifies teaching content into conceptual, procedural, and attitudinal categories, while Zabala (1998) interprets this classification through the following questions: What should one know? What should one know how to do? How should one be?

When referring to conceptual content, it is essential to consider the need for factual knowledge. Before attempting to understand a concept, one must have knowledge of facts, information, and characteristics. This database is fundamental to conceptual understanding. According to Coll (1998), factual information is used to support conceptual content. In this regard, Zabala (1998) emphasizes that factual content includes knowledge of facts, events, situations, data, and concrete and singular phenomena, such as a person's age, the conquest of a territory, or the location of a mountain. Their singularity and descriptive, concrete nature are defining characteristics.

Zabala (1998) stresses that facts are seen as the most evident part of a cultured individual and have often been used in exams and assessments. Although this type of knowledge has recently been devalued, it is fundamental for understanding most of the information and problems encountered in daily life and in professional settings. However, these facts and events must be associated with concepts that allow for their interpretation, as without them, knowledge would be merely mechanical. Facts and data alone are not sufficient for students to build their knowledge and establish relationships. Concepts are essential for interpreting these facts and data, giving them meaning within a network of scientific or everyday concepts.

According to Coll (1998), concepts allow us to organize and predict reality, and they can take various forms—such as scientific, philosophical, intellectual, and everyday—enabling the construction of knowledge and stimulating curiosity, memory, and logic. Concepts are understood as a set of symbols, facts, or objects that share similar or common characteristics, establishing cause-and-effect relationships. They are essential tools for understanding and describing the world, allowing knowledge to be constructed through a network or hierarchy (Zabala, 1998).

Coll (1998) emphasizes that the processes of learning facts and concepts are distinct. According to the author, it is essential to understand that facts and concepts are interconnected and cannot be separated in the learning of conceptual content. While facts and data can be learned in a more passive and mechanical way, the understanding and construction of concepts require a more active attitude from the student, based on the attribution of meaning to the content. In this context, the process of learning concepts is expected to be more autonomous and diverse, as it depends on the comprehension and transformation of what is being proposed.

The repetition of this process is insufficient for students to acquire concepts. The understanding of a concept occurs when the learner is able to establish meaningful relationships between the new knowledge and their own mental models or representations of reality. Each student possesses their own models and representations of reality, and conceptual learning takes place when they are able to relate what they are learning to these mental models and translate the knowledge according to their own understanding.

Table 1 summarizes the proposals for the construction of learning related to conceptual content and factual content.

Table 1.

Facts and concepts as content (adapted from Coll, 1998, p. 27)

	Learning of Facts	**Learning of Concepts**
Consists of	Literal copying	Relationship with prior knowledge
Achieved through	Repetition (mechanical learning)	Understanding (meaningful learning)
Acquired	All at once	Gradually
Speed of acquisition	Fast, but easily forgotten	Slower, but long-lasting

The term **content** traditionally refers to theory, information, facts, and definitions. However, Coll (1998) emphasizes the importance of procedural content, a category that deserves educators' attention. The challenge in this context is to incorporate practice and **know-how**, going beyond the mere application of conceptual content. Procedural content involves the

organization of a set of actions aimed at achieving a specific goal, requiring specific skills and competencies for its execution. According to Coll (1998), conceptualizing procedural content implies distinguishing content that involves organized and effective action, encompassing rules, methods, skills, and strategies directed toward the construction of learning through action.

According to Zabala (1998), the strategies adopted by the teacher play a fundamental role in the student's learning of procedural content. To this end, it is necessary to propose activities that allow for both the practice and reflection on the process involved, as well as its application in different contexts.

> The application in different contexts is based on the fact that what we learn will be more useful insofar as we can use it in situations that are not always predictable. This need requires that exercises be as numerous as possible and carried out in different contexts so that learning can be applied on any occasion (Zabala, 1998, p. 46).

Therefore, according to Mühl (2023), it is essential that the teacher master this type of content, know how to adapt it to the needs of their students, and transform it into meaningful learning experiences.

Zabala (1998) points to the belief that skills acquired in a specific context, such as Mathematics, are easily transferable to other contexts, assuming that mathematical reasoning ability is universally applicable. In the same perspective, Coll (1998) adds that various mathematical contents—such as counting, building graphs, calculating, and classifying—are procedural, requiring the discussion of techniques and strategies for their teaching, which should be included in teacher education.

Rodrigues and Groenwald (2021) complement this view by stating that the procedures of identifying, solving, and constructing mathematical calculations are considered essential by teachers, reinforcing the need for practical strategies that develop these skills in different contexts and in ways that are meaningful to students.

Zabala (1998) emphasizes the importance of discussing the role of content, as it forms the foundation of classroom practice and differs from objectives and goals. Thus, it is crucial that teachers reflect on **what to teach** and **how to teach**, considering their decisions and pedagogical practices. In this sense, Schulman (2019) argues that the approach to content and methodology must be contextualized and interconnected, and that the teacher's knowledge of the content is crucial in this process, as it influences how they interpret and present that knowledge to students. Bringing the teacher's representations and interpretations of the content to be taught into the process implies transforming that content into something that makes sense for the student, taking into account their context and prior knowledge.

Therefore, teaching practice based on school content provides support for the Continuing Education of teachers, representing a daily challenge. Knowing the content and applying it in the classroom is not a simple task; it requires study and reflection. Although curricula indicate what should be taught, it is the teacher's responsibility to decide how to teach it, which can be extremely challenging given the various demands of education (Mühl, 2023).

Methodology

This study[4], employed a qualitative approach to investigate the perceptions of early years teachers regarding the implementation of the BNCC in the Mathematics curriculum and to identify how Continuing Education can support overcoming the challenges encountered in teaching practice. A qualitative approach was chosen in order to gain a detailed understanding of the Mathematics teaching process, with particular focus on the implementation of the BNCC. According to Gray (2012), the qualitative approach values understanding phenomena within their natural and specific contexts, allowing for thorough and comprehensive exploration. The research instruments used in this methodology are varied and include observations, interviews, questionnaires, document analysis, among others. These methods are effective in exploring the how and why of one (or more) phenomenon(a), as well as in testing the validity of theoretical propositions in light of the evidence collected (Gray, 2012).

This methodology also enables an in-depth understanding and analysis of the topic under investigation, as it allows for immersion in the research context, enabling the researcher to interact with and observe various phenomena within the scope of the study (Gerhardt & Silveira, 2009). This approach is contextual, allowing for the understanding of situations that emerge under the specific circumstances of the research.

For data collection, the case study method was used, which, according to Gil (2002), allows for a detailed analysis of one (or a few) objects, providing thorough knowledge of the characteristics and challenges faced by the participants. The case study was specifically chosen to examine the experiences of the group of teachers, allowing for a broad view of common issues as well as the variability among different school contexts. This method is particularly useful for exploring complex educational phenomena and understanding the dynamic interactions between educational policies, such as the BNCC, and daily pedagogical practice, as well as how these interactions influence and are influenced by the Mathematics curriculum.

[4] The present investigation, linked to a master's research project, had its data analyzed from a curricular perspective, with the analysis conducted by the first two authors, who are doctoral candidates, under the supervision of the last author.

Including the curriculum as a central focus allows for the exploration of how the BNCC's curricular guidelines are interpreted and implemented in pedagogical practice, providing valuable reflections on the effectiveness and challenges of these educational policies.

The participants in this study were 16 early years Elementary School teachers working in the municipal school system of Bom Retiro do Sul, RS. A questionnaire[5] was used as the data collection instrument for this research. The questionnaire was administered at the beginning of the Continuing Education program, aiming to obtain information about the teachers' initial perceptions regarding the BNCC and teaching practice. It included both open- and closed-ended questions, thus allowing for the collection of qualitative data.

It is worth noting the careful preparation of the questionnaires to ensure the validity of the data collection process, as previously discussed by Lakatos and Marconi (2003). In this regard, certain criteria were considered in the construction of the questions, such as clarity, objectivity, and relevance to the research objectives.

In summary, the choice of a qualitative approach is justified by the need to capture the specificities of the perceptions and experiences of the participating teachers. The analysis of the responses was based on the theoretical framework, particularly the concepts of prescribed curriculum and real curriculum. The teachers' statements were grouped according to thematic categories, such as interpretation of the BNCC, lesson planning, and challenges in implementation.

Results and Discussion

The analysis presented in this study is based on the teachers' perceptions regarding their knowledge and familiarity with the BNCC, as well as the mathematical skills and objects of knowledge included in this document. The questionnaire explored these perceptions and also identified the main challenges and difficulties faced in their teaching practice. Understanding these aspects forms the basis for analyzing the results, allowing for a deeper reflection on the mathematics curriculum proposed by the BNCC.

These issues are essential for understanding how the curriculum is interpreted and applied in practice, providing valuable insights into the implementation of the BNCC and its implications for Mathematics teaching in the municipality of Bom Retiro do Sul, RS. To this end, the teachers were asked about their previous experiences with the document, whether they

[5] The questionnaire is part of the research instruments of the first author's master's thesis. Additionally, the study was submitted to and approved by the Research Ethics Committee for Human Subjects, under the Certificate of Presentation for Ethical Consideration (CAAE) number 51824221.6.0000.5349.

had worked with it or read its content, and their opinions regarding the organization of mathematics objects of knowledge.

Thus, by analyzing the data presented in Table 2, the discussion focuses on how familiar the teachers are with the mathematics curriculum, the BNCC, and their own teaching practice. The teachers participating in a Continuing Education program were asked about these aspects and shared their perceptions through a questionnaire administered via Google Forms.

Table 2.

Questions related to the BNCC (Mühl, 2023, p. 98)

Teacher	Have you read or worked with the BNCC? What is your opinion on the organization of the Mathematics objects of knowledge?	Did you find any difficulty in understanding the BNCC proposal for Mathematics in your grade level? If so, what?
T1	Yes. Interesting but complex.	No.
T2	Yes, I quite like the organization.	No.
T3	I have worked with it, I think it's important, but I also believe there is a lack of understanding and study.	No.
T4	Yes, a bit confusing at times.	Yes, Geometry.
T5	I have read and worked with it, very good.	Some.
T6	Yes. Interesting.	Yes, some things are confusing and hard to apply for the student.
T7	Yes, because they are organized in a clear way.	No.
T8	Yes, I have read and worked with it. I consider it organized. However, I notice that some skills and competencies are somewhat below the expected level for the corresponding grade. I believe it will align better when the Base is truly worked on from early childhood education.	Yes. Understanding skills and competencies and adapting them to content.
T9	Yes.	Yes. I believe it's always a challenge; it's not just about content but how we teach it.
T10	I have not yet worked in the early years.	Yes. How to find the right objects of knowledge to develop the proposed skills.
T11	I studied it very broadly during teacher training.	No.
T12	I have read it. I think that in the second grade, numbers up to 999 are unfeasible.	Yes. The relationship between content and skills.
T13	Yes. Very specific.	Yes. Relationship between content and skills.
T14	Superficially, I think it's quite advanced, especially for the reality of our students.	I don't remember specifically; in the 1st grade it's more manageable, but in the 5th grade it's difficult, especially after the pandemic period.
T15	They are well designed.	I don't know.
T16	In Early Childhood Education.	In the skills.

The results presented in Table 2 show that, although most of the teachers have had contact with the BNCC, many still face difficulties in its interpretation and application. This scenario reflects the discrepancies highlighted by Lopes and Macedo (2011) and Sacristán (2017) between the prescribed curriculum and the real curriculum. The prescribed curriculum, represented by the BNCC, aims to ensure uniformity in teaching, but its effective implementation requires teachers to adapt and re-signify the curricular guidelines to the concrete reality of their classrooms. As Sacristán (2017) emphasizes, this teacher mediation is essential to prevent the curriculum from becoming a rigid set of norms disconnected from pedagogical practice.

According to three teachers (Table 2), there is concern regarding student learning development, as they consider some of the skills and content presented in the BNCC to be advanced or complex for the indicated grade level. In this sense, the participating teachers highlighted the importance of building on students' prior knowledge, as emphasized by the BNCC. This perception aligns with Coll (1998), who argues for the need to adapt content so that it is meaningful and accessible, respecting students' individual contexts and capacities. Furthermore, Libâneo (2012) emphasizes that although content and its logical organization are important in teaching and learning processes, it is essential that it includes elements from students' lived experiences to hold meaning.

Rodrigues and Groenwald (2021) support this analysis by pointing out that teachers identify similar difficulties in applying the content from the BNCC. They report that some concepts and skills are complex or disconnected from students' realities, highlighting the need for a more contextualized approach that is adapted to specific learning conditions. This comparison underscores the importance of both Continuing Education for teachers and the adaptation of content to ensure that the curriculum is meaningful and accessible to all students.

Another aspect analyzed is how these teachers plan their lessons based on the BNCC and the Mathematics curriculum, aiming to observe how this knowledge directly influences pedagogical planning. For this analysis, they were asked whether they are able to follow what the guidelines recommend (Table 3).

Table 3.

Planning and the BNCC (Mühl, 2023, p. 98)

Teacher	Are you able to plan according to what is proposed by the BNCC? Why?
T1	I try to address all skills in a simple and broad way.
T2	Partially, because I need to use the municipal study plan.
T3	I try, but it doesn't always fit the reality of my school and students.
T4	Yes, but sometimes I have a bit of difficulty interpreting it.
T5	Yes.
T6	Yes. Always.
T7	Yes, because the BNCC provides a direction for my planning.
T8	Partially. Due to the difficulties presented by students, especially related to the pandemic.
T9	I try, but at times I have doubts.
T10	Yes. Because it is broad. It allows for expansion of the work.
T11	No. There is a lack of better understanding.
T12	Too much content.
T13	Yes. But with doubts about whether it is correct.
T14	I find it difficult; I can't organize myself.
T15	Because it is well distributed.
T16	No. I found it a bit confusing.

Regarding lesson planning, the teachers' responses reflect a range of experiences and challenges. As shown in Table 3, some teachers reported being able to plan according to what is proposed by the BNCC, while others face difficulties due to the complexity of the document or the limitations imposed by their school context. This indicates the need for greater support and Continuing Education to facilitate discussion and reflection on curriculum documents and their impact on planning and teaching practices. Shulman (as interviewed in Born et al., 2019) emphasizes that teachers' knowledge of content is crucial for interpreting and presenting it to students, which implies transforming it into something meaningful for them.

While the logical organization of content is important in teaching and learning processes, it is also essential that such content includes elements from students' lived experiences to be truly meaningful (Libâneo, 2012). In this context, it is understood that it is the teacher's responsibility to consider students' prior knowledge—whether acquired in previous school years or from their everyday life (Zabala, 1998).

Participants reported various difficulties in interpreting and understanding the BNCC, as illustrated by the comment: **How to find the right learning objectives to develop the proposed skills** (P10). This suggests that teachers' exposure to the document was insufficient

for its correct use, or that they are not yet fully familiar with the specific guidelines for early years, even though the BNCC provides a detailed linkage between learning objectives and the skills to be developed (Brasil, 2017).

The difficulty reported by some teachers in planning their lessons according to the BNCC reinforces criticism of curricular standardization and its implications for educational justice. As discussed by Ponce and Araújo (2019), the imposition of a centralized curriculum disregards regional and social diversity, resulting in a standardized teaching model that may exacerbate inequalities. This issue is evident in the teachers' responses, where they highlight difficulties in adjusting learning objectives and skills to the needs of their students. Consequently, lesson planning becomes a space of tension between complying with the norms of the prescribed curriculum and addressing the concrete demands of student learning.

Additionally, the challenges faced by teachers are not limited to content knowledge but extend to how to teach effectively. This echoes Shulman's (2014) argument that, in teaching practice, the teacher's role is not only to know the academic content and the norms that govern teaching, but also to transform, adapt, and give meaning to this content to facilitate student learning.

The BNCC still generates doubts and difficulties in teaching practice. According to Mühl (2023), aligning planning with the principles outlined in the BNCC is not yet a consistent practice. Encouraging reflection on content, its organization, and the possible path for its implementation is one of the goals of Continuing Education. This should be done not through tips or ready-made solutions, but through discussions, idea exchanges, and evaluation of each participant's classroom practices.

The challenges reported by teachers highlight the need for Continuing Education that goes beyond mere understanding of the BNCC and fosters critical reflection on its implementation. Drawing on the discursive analysis proposed by Lopes and Macedo (2011), the curriculum is understood as a social construction embedded with discourses that regulate practice. In this context, the teacher's task is not simply to apply or reinterpret norms, but to recognize the discourses shaping their practice and to produce new meanings that respond to the specificities of their teaching context. Therefore, Continuing Education should not only

promote technical alignment with normative guidelines but also support the development of pedagogical strategies that enhance curricular justice by ensuring content is taught in a contextualized and meaningful way.

The BNCC is a normative document intended to guide all school curricula across Brazil, aiming to standardize and improve education nationwide. As discussed by Libâneo (2012), content and its logical organization are essential in teaching and learning processes. However, it is crucial that such content is meaningful to students, incorporating their lived experiences and backgrounds. This connection can foster learning that is relevant to their reality. In this sense, the study sought to examine whether the school's study plan was aligned with the BNCC guidelines (see Table 4).

Table 4.

Study Plans and the BNCC (Mühl, 2023, p. 101)

Is your school's study plan aligned with the BNCC guidelines?	**Number of teachers' responses**
I don't know.	6
No.	2
Yes, but not completely.	3
Yes, but I can't follow it.	2
Yes, completely.	3

The alignment between the school's Study Plan and the BNCC is essential to meeting students' needs, as lesson planning must be based on this alignment. The BNCC was developed and approved with the aim of establishing basic knowledge for all students across Brazil. Although there are challenges in adapting it to the specific realities of each school context, the Brazilian normative educational document (Brasil, 2017) must be followed and updated as needed.

The variety of perceptions regarding the alignment between the Study Plan and the BNCC highlights that, even as a national normative document, its implementation varies depending on the school context. This reinforces Sacristán's (2017) critique of the gap between the prescribed curriculum and the real curriculum. The fact that some teachers are unable to follow the Study Plan or are unclear about its alignment with the BNCC reveals that, in practice,

imposing a homogeneous curriculum does not translate into uniform application, but rather into multiple interpretations and challenges in pedagogical adaptation.

In this context, Continuing Education plays a vital role. Identifying difficulties, clarifying doubts, exchanging ideas, and implementing such adjustments in teaching practice are essential and timely discussions. Teaching practice is becoming increasingly demanding, requiring constant professional development (Zabala, 1998). Continuing Education, therefore, not only supports the understanding and application of the BNCC but also provides a space for critical reflection on pedagogical practices, fostering a collaborative environment and ongoing professional growth (Mühl, 2023).

The analysis of teachers' responses, as presented in Table 4, reveals a range of perceptions regarding the adequacy of the school's Study Plan in relation to the BNCC. Six teachers stated that they did not know whether the plan was aligned with the BNCC, indicating a possible lack of clarity or training regarding the document. Two teachers reported that the plan was not aligned, while three said it was partially aligned but difficult to follow. Two others said they struggled to follow the plan despite it being aligned, and three confirmed that the plan was fully aligned with the BNCC.

These varied responses highlight the need for effective Continuing Education programs capable of addressing these disparities and ensuring that all educators have a clear and practical understanding of the BNCC. Ongoing professional development and critical reflection on content and methodology are essential to addressing the contemporary challenges of education and ensuring that teaching aligns with national guidelines and students' needs.

Final Considerations

In the Brazilian context, the BNCC plays a normative role, functioning as a prescribed curriculum that aims to ensure a common learning base for all students. However, as discussed throughout this study, curriculum standardization imposes significant challenges, especially regarding its implementation across diverse school contexts. The imposition of a single teaching model may overlook regional and student-specific diversities, generating tensions between the formally established curriculum and its actual enactment in pedagogical practice.

The data show that many teachers feel challenged when interpreting and applying the BNCC, reinforcing the need for training spaces that promote clarification, dialogue, and the collective construction of meaning. Although this study did not measure the direct impact of Continuing Education, the participants' narratives highlight its relevance as a support strategy for curricular development in school settings.

The teachers express awareness of the need for collective reflection moments on the BNCC, emphasizing the importance of Continuing Education initiatives. More than offering theoretical and methodological support, these spaces enable the exchange of experiences and the shared development of strategies to face the challenges encountered in implementing the curricular guidelines. Such interaction is essential for teachers to interpret and adapt the guidelines to the concrete realities of their students, fostering more meaningful and contextualized teaching.

Furthermore, the results of this study highlight the need for targeted and practical training that addresses the real difficulties faced by teachers in the classroom. This includes greater clarity in applying the learning objectives and skills outlined by the BNCC, as well as pedagogical strategies that make Mathematics education more accessible and engaging for students. Teacher mediation is essential to ensure that the prescribed curriculum does not become a limiting factor but rather a resource for enhancing learning.

In this context, the relationship between the prescribed and the enacted curriculum becomes central to understanding the challenges faced by teachers in implementing educational policies. As discussed throughout this study, despite its structuring function, the BNCC cannot be applied uniformly, given the diversity of school realities. Thus, teacher mediation plays a crucial role in pedagogical adaptation, ensuring that the curriculum is implemented in an equitable and contextually relevant manner.

Future research could deepen the analysis of teachers' curricular autonomy and the strategies used to adapt the BNCC in pedagogical practice. Additionally, it would be relevant to explore the impact of Continuing Education on mediating between the prescribed and enacted curricula, expanding the understanding of how teachers can be better prepared to face the challenges of curricular standardization without compromising teaching quality and equity.

Finally, considering that the BNCC is a nationwide document applied in a country marked by great diversity and regional challenges, future studies should expand this investigation to include teachers from different regions. This would allow for a broader view of the difficulties and adaptations encountered in various contexts, contributing to the improvement of educational policies more attuned to the needs of teaching practice.

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