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Mathematical Literacy at BNCC

O Letramento Matemático na BNCC

Anie Masquete Paruta[1]

Virgínia Cardia Cardoso[2]

Abstract

This study seeks to analyze how Mathematical Literacy is approached in the Common National Curricular Base - BNCC of the Early Years of Elementary School. From the discursive textual analysis, we seek to understand the concept of mathematical literacy that involves in addition to considering social practices in teaching, the search for favoring a critical look at social issues. Thus, the relevance of this study stems from considering mathematical literacy as a perspective, which seeks to consider in the teaching of mathematics the social context and the formation of citizens who have autonomy to understand and act in reality. As it is a normative indication, a careful look is necessary, so that the BNCC is not a sign of regression in the work with mathematics. From this study, it was possible to notice that the BNCC considers mathematical literacy in the presentation text of the area, however, there is little evidence of this perspective in the indicated skills.

Keywords: "Mathematical literacy" "BNCC" "Mathematical alphabetization"

Resumo

Este estudo busca analisar como o Letramento Matemático é abordado na Base Nacional Comum Curricular – BNCC dos Anos Iniciais do Ensino Fundamental. A partir da análise textual discursiva, procuramos compreender o conceito de letramento matemático que envolve além da consideração das práticas sociais no ensino, a busca por favorecer um olhar crítico frente às questões sociais. Assim, a relevância deste estudo decorre de considerar o letramento matemático como perspectiva, que busca considerar no ensino da matemática o contexto social e a formação de cidadãos que possuem autonomia para compreender e atuar na realidade. Como se trata de uma indicação normativa, se faz necessário um olhar atento, de modo que a BNCC não seja sinal de retrocesso no trabalho com a matemática. A partir deste estudo, foi possível perceber que a BNCC considera o letramento matemático no texto de apresentação da área, porém, há pouca evidência desta perspectiva nas habilidades indicadas.

Palavras-chave: “Letramento matemático” “BNCC” “Alfabetização matemática”

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[1] Master's degree in Teaching and History of Science and Mathematics from Universidade Federal do ABC (UFABC), Brazil. Email: anie.cadu@gmail.com. ORCID: https://orcid.org/0000-0003-4736-2909.

[2] PhD in Education from the State University of Campinas. Professor at the Universidade Federal do ABC (UFABC), Brazil. Email: virginia.ufabc@gmail.com. ORCID: https://orcid.org/0000-0001-9639-9578.

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Introduction

The Common National Curriculum Base - BNCC is a normative document that aims to guide the construction of the curricula of Brazilian schools, guaranteeing the learning rights of students throughout the country. Its creation is justified by articles of the Federal Constitution of 1988, the Law of Directives and Bases of Education (Law No. 9.394/96), and Goal 2 and Goal 7 of the National Education Plan (Law No. 13.005/2014).

The introductory text of the BNCC (MEC, 2018) states that its elaboration process included moments of discussion with the participation of the entire educational community. According to the document, public hearings were held with the participation of experts in each field of knowledge and with the consultation of educational professionals and civil society from all over the country.

However, several authors claim that the participation of experts and society did not take place in this way. For example, Passos & Nacarato (2018), who participated in the critical reading of the first version of the document, point out that after the change of government with the impeachment of President Dilma Rousseff, the team that collaborated in the construction of the BNCC was replaced by a new team made up of invited experts and business representatives, who prepared the third version of the document and sent it to the National Education Council for approval. Thus, as stated by Passos & Nacarato (2018, p. 119), "there is a mismatch between the logic defended by the actors of the school context for the goals and objectives of school education and the logic of the neoliberal model of public policy aimed at education...".

The proposal of the Ministry of Education to create a common national base, according to the document, aims to present the expected learning for students all over the country, guaranteeing the rights of learning, as already provided in the National Education Plan, so that the fragmentation of educational policies is overcome. This is a great challenge, considering the territorial dimensions and the cultural diversity present in Brazil, especially when thinking from the perspective of mathematical literacy, which requires the consideration of the social practices of such diverse contexts. Passos & Nacarato draw attention to this issue by stating that

> The conception of the BNCC, in addition to placing the responsibility on the subject - basing itself on skills and abilities - disregards the plurality of contexts and cultures of the country and does not provide for the social practices of the riverside regions, the countryside, the indigenous communities and the quilombos (Passos & Nacarato, 2018, p. 128).

Thus, the approval of the BNCC has generated great tensions among education professionals, who point to criticisms related to the presence of corporate interests, the attempt to standardize the curriculum, as well as the content of the knowledge areas

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themselves. In this study, we try to contribute to the reflection on the teaching of mathematics, focusing on the approach of mathematical literacy in the BNCC.

Mathematical literacy is a relatively recent expression that includes a perspective in which the subject uses mathematical knowledge effectively in different situations in their daily lives. According to Fonseca (2004), mathematical literacy from a literacy perspective consists of the work done by the school in providing students with access and developing strategies and possibilities for reading the world. Thus, working from a mathematical literacy perspective is opposed to traditional mathematics education, which ignores the student's knowledge as well as his or her social context and prioritizes the transmission of knowledge through lectures and exercises.

In the early years of elementary school, this perspective began to be better known through the training offered to literacy teachers (who work with students from the 1st to the 3rd grade of elementary school) by the Federal Government's National Pact for Literacy at the Right Age (PNAIC). With the arrival of the BNCC, this perspective is indicated in the work with mathematics of all the first years of elementary education, but the concern is with the question: how is this perspective considered in the document? Does the approach introduced have the potential to contribute to teachers taking this perspective into account in their planning?

Therefore, the aim of this article is to analyze the approach given by the BNCC to mathematical literacy in the early years of primary school. How this issue is addressed in the document, both in the presentation of the mathematics area and in the competencies and skills indicated.

The methodology used was qualitative research with document analysis. Considering the normative indication of the BNCC, which should guide the construction of school curricula and educational networks throughout the country, and the fact that this document has the potential to influence the initial and continuing education of teachers and the development of teaching materials; the analysis of the approach of mathematical literacy is of great importance in order to have clarity of its presence in the curricula to be built.

This study was part of a Master's research in the area of Teaching and History of Science and Mathematics, and was the starting point to understand how mathematical literacy is addressed in the BNCC, to then analyze the knowledge and practices of teachers of the early years of primary education regarding this expression. This research, completed in 2020, was developed with teachers of a municipal school in the city of São Bernardo do Campo/SP. It was concluded that it is necessary to foresee formative actions for a theoretical deepening about mathematical literacy, as well as situations of socialization of practices, to expand the theoretical and practical knowledge involving the sociocultural and critical dimension of this perspective.

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Talking a little about the BNCC

The BNCC for the Kindergarten and Elementary Education stages was approved in December 2017, and the full version for Secondary Education was approved in December 2018, the latter being the version considered in this article.

The document is organized into an introduction, the Early Childhood Education stage, the Elementary Education stage, and the Secondary Education stage. The chapter on Elementary Education, the focus of this study, is organized by knowledge area: Language, Mathematics, Natural Sciences, Human Sciences and Religious Education. The competencies and guidelines presented are common to all areas, and there is an orientation for the curricula of each school system to take into account local and regional characteristics and specificities. This aspect was indicated in the Curricular Guidelines drawn up by the National Education Council (CNE) in 2000 and supplemented in 2010.

In the presentation of the field of mathematics (referring to elementary school), the document emphasizes the need for mathematical knowledge for all students, both for its application in society and for its potential in the formation of critical citizens aware of their social responsibilities. Thus, the beginning of the text on mathematics shows a tendency towards a critical approach to mathematics, which considers not only the utilitarian function of mathematics, but also, as Skovsmose (2001) argues, its role in providing mathematical tools for students to be able to have a critical view of the world. However, this notion is not further developed in the rest of the text.

The document refers to the intention that students understand the use of mathematics to solve problems, and this aspect is emphasized as being of great importance in the work in the classroom, because unlike the way this area of knowledge has been worked on throughout history (through repetitive and mechanical exercises), the teaching of mathematics must be based on the solution of problem situations.

In the BNCC, the term "mathematical literacy" is cited in the presentation of the field of mathematics, with the definition (in a footnote) using the PISA[3] (Program for International Student Assessment) matrix as a reference:

> According to the 2012 Pisa matrix, mathematical competence is the ability of an individual to formulate, apply and interpret mathematics in a variety of contexts. It involves reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena. This helps individuals to recognize the role that mathematics plays in the world and for constructive, engaged, and reflective citizens to make informed judgments and necessary decisions. (MEC, 2018, p.266).

[3] 2012 PISA matrix available at http://download.inep.gov.br/acoes_internacionais/pisa/marcos_referenciais/2013/matriz_avaliacao_matematica.pdf. Accessed October 13, 2019.

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The use of this reference draws attention when reading the document because no other reference is cited to theoretically ground the issues addressed. Authors and theorists researching the teaching of mathematics have been disregarded, as well as materials such as the one used in the PNAIC, produced by the Ministry of Education itself, limiting the reference to an international assessment matrix. As the Brazilian Society of Mathematics Education points out:

The lack of a theoretical reference makes the information less accessible, since it is up to the teachers and pedagogical professionals to look for a deeper understanding of certain terms or concepts, and their research may not have the same meaning (considering the theoretical/methodological basis) as that presented in the document.

Documentary analysis of the BNCC: focus on mathematical literacy

The methodology used was document analysis with a focus on mathematical literacy. The analysis proposal, as indicated by Flick (2009), started from a broader sample (considering the texts in their entirety) and, during the study, focused on a more limited sample according to the criteria defined to achieve the research objective. Thus, we have tried to delimit the relevant points in the BNCC and analyze how mathematical literacy is addressed, both in terms of the concept and its presence in the competencies and skills presented.

> What is document analysis? We can define it as "an operation or a series of operations aimed at representing the content of a document in a form different from the original, in order to facilitate, at a later stage, its consultation and referencing". (...) The purpose to be achieved is the storage under a variable form and the facilitation of access to the observer, in such a way that he obtains the maximum of information (quantitative aspect), with the maximum of pertinence (qualitative aspect). (Bardin, 2011, p.46)

Thus, we sought to highlight in the BNCC, the approach to math literacy, both as a work perspective, and its presence in the proposed skills and abilities. For this, clippings of relevant information were selected and organized into categories for better visualization and analysis. According to Bardin (2011) the categories offer a simplified and organized representation of the raw data. The author explains that "...categories, are rubrics or classes, which bring together a group of elements (units of record), in the case of content analysis, under a generic title..." (Bardin, 2011, p.117)

The categories identified in this analysis were: Concept of mathematical literacy; consideration of students' knowledge; indication of situations of practices of social use of mathematics and indication of numerical carriers and/or textual genres of everyday life that make use of mathematical language.

The mathematical literacy approach in the BNCC: analyzing the document.

Based on the presentation text and the subject specific competences of the area of mathematics, the concept of mathematical literacy appears sometimes explicitly and

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sometimes in conjunction with the development of other ideas, as well as some indications of practical situations, as shown in the table below. On the other hand, there is little consideration of students' prior knowledge, as well as indications of numerical carriers and/or everyday textual genres (which make use of mathematical language).

Table 1 - Evidence of the Mathematical Literacy approach by categories:

CATEGORY	BNCC DATA
Concept of mathematical literacy	Mathematical knowledge is necessary because of its **great application in contemporary society**, both for its potential in the **formation of critical citizens, aware of their social responsibilities.** p.265
	Mathematics creates abstract systems (...). These systems contain ideas and objects that are fundamental **to the understanding of phenomena, the construction of meaningful representations, and consistent argumentation in a variety of contexts.** p.265
	...students **relate empirical observations of the real world to representations (tables, figures, and schematics)** ... p.265
	...opportunities to use mathematics to solve problems, **applying concepts, procedures, and results to obtain solutions and interpret them according to the contexts of the situations.** p.265
	...mathematical literacy, defined as the skills and abilities to reason, represent, communicate, and argue mathematically in order to support the making of conjectures, formulation, and solution of problems in a variety of contexts, using mathematical concepts, procedures, facts, and tools. p.266
	...mathematical literacy that ensures students recognize that **mathematical knowledge is fundamental to understanding and acting in the world. p.**266
	...organization of mathematical learning, based on the **analysis of situations from everyday life,** from other areas of knowledge, and from mathematics itself. p.266
	...development of fundamental skills for mathematical literacy (**reasoning, representation, communication, and argumentation)** p.266
	...mathematics is a human science, the fruit of the **needs and concerns of different cultures at different historical moments**... p.267
	... using **mathematical knowledge to understand and act in the world**. p.267
	... quantitative and qualitative aspects present **in social and cultural practices**, in order to investigate, organize, represent, and communicate relevant information, **to interpret and evaluate it critically** and ethically, and to produce convincing arguments. p.267
	... **solve problems from the physical world** and from different areas of

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	knowledge ... p.271
	... construct representations **of known spaces**... p.272
	...solve problems about **buying and selling situations** and develop, for example, ethical and **responsible attitudes towards consumption**. p.273
Consideration of learners' knowledge	...the context in **which the school is located must be considered**: in schools in agricultural regions, for example, agrarian measures may deserve more attention in the classroom. p.273
	...the collection and organization of data from **a survey of student interest**. p.275
	...one must **accept the children's everyday experiences with numbers**, shapes, and space... p.276
	One cannot curb **the curiosity and enthusiasm** for learning that is so common at this stage of schooling, let **alone the students' prior knowledge**. p.276
Indication of practical situations of social use of mathematics	Develop and/or discuss **projects that address, above all, issues of social urgency**... p.267
	In the study of these number fields, records, **uses, meanings**, and operations should be emphasized. p.268
	Use mathematical processes and tools, including available digital technologies, to model and solve every day, social, and other knowledge problems... p.267
	Facing **problem situations in multiple contexts, including imagined situations,** not directly related to the practical-utility aspect... p.267
	...this notion is also evident in **many everyday actions and in other areas of knowledge, such as sales and trade, chemical balances, graphical representations, etc**. p.268
	...students are expected to develop **different strategies for obtaining the results, especially by estimation and mental calculation, as well as algorithms and the use of calculators**. p.268
	...put them in front of **tasks, such as those involving measurement**, in which natural numbers are not enough to solve them... p.269
	...must solve problems **arising from everyday situations involving quantities such as length, mass, time, temperature, area** (of triangles and rectangles), **and capacity and volume** (of solids formed by rectangular blocks), without using formulas, resorting, when necessary, to transformations between more usual standardized units of measurement. p.273
	...the use of technologies - such as calculators, to evaluate and compare results, **and spreadsheets, (...) to learn statistical concepts and procedures, but also to use them for the purpose of understanding reality. p.275**

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	...ability to perform calculations mentally, to make estimates, to use a calculator, and to **decide when it is appropriate to use one or another calculation procedure**. p.276
Indication of numerical carriers and/or everyday textual genres that make use of mathematical language	...using **different registers and languages (graphs, tables, schemes, as well as written text** in the native language and other languages to **describe algorithms, such as flowcharts, and data).** p.267
	...estimate distances, using **maps** (paper, tablets or smartphones), sketches and **other representations as support**. p.272

Source: the authors
*Evidence in the text of the table made by the author

As it can be seen, the perspective of mathematical literacy appears quite clearly in the presentation and in the subject-specific competencies of the field of Mathematics, especially in the passages related to its concept. Thus, it can be said that the ideas of mathematical literacy confirm the comments of Fonseca (2014) and Mendes (2007) on the characteristics of this perspective, which include the social role of mathematics education, in the sense of highlighting the relationship of mathematics to social practices, contributing to facing the dilemmas of everyday problem situations, as well as promoting the access and development of strategies and possibilities of reading the world, as shown in the excerpts:

> ...mathematical literacy that ensures students recognize that **mathematical knowledge is fundamental to understanding and acting in the world**. (MEC, 2018, p.266)

> ...quantitative and qualitative aspects present in **social and cultural practices**, in order to investigate, organize, represent and communicate relevant information, **to interpret and evaluate them critically and ethically**, producing convincing arguments. (MEC, 2018, p.267)[4]

Considering this dimension of criticality from the teaching of mathematics, also meets the ideas of Skovsmose (2001, p.87) that "mathematical literacy has a role to play in education (...) in trying to develop democratic competence, so mathematical literacy should be seen as composed of different skills: mathematical, technological and reflective".

However, if on the one hand in the introductory text the concept of mathematical literacy appears quite obvious, on the other hand, when analyzing the skills presented, it is observed that its presence is still subtle, as observed by Passos & Fonseca:

> In the case of mathematics, the competencies listed in the BNCC are close to the expectations we advocate for teaching; they are quite broad and include all mathematical processes (...) However, in a careful analysis of the skills proposed for each year, this articulation is not made explicit. The set of skills listed is limited to the thematic unit itself. (Passos & Fonseca, 2018, p.128)

[4] Authors' emphasis.

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When analyzing the text, it is observed that the perspective of mathematical literacy is implied through some terms (which are not explicit in all skills) such as:

- ✓ Everyday situations, places or events
- ✓ Familiar events or environments
- ✓ Familiar objects from the physical world
- ✓ Variables that interest you
- ✓ Aspects of reality nearby
- ✓ Buying, selling or exchanging situations
- ✓ Most common measurements in sociocultural contexts
- ✓ Socio-cultural realities
- ✓ Social issues (ethical and responsible consumption; global warming).

Although the text points out that "curiosity and enthusiasm for learning, which are so common in this stage of schooling, cannot be curbed, much less students' prior knowledge" (MEC, 2018, p.276), one does not notice in the rest of the text any concern for the consideration of students' prior knowledge, an important aspect for the social practices that students experience with mathematics to be considered in school practices. In this respect, it can be observed in the presented skills related to numbers that only in one of the skills planned for the first year (EF01MA01) there is a concern with the use of numbers in everyday situations (which also does not guarantee that the students' knowledge is taken into account, since the teacher himself can "infer" everyday situations to present to the students), and the rest of the skills related to "natural numbers" are limited to procedures to be developed by the students in school activities (using, counting, estimating, comparing, reading and writing numbers). Thus, all the knowledge that students bring with them about the use of numbers in games (physical or digital) and games that they play or in everyday situations outside of school, their observations about the different contexts in which these numbers appear, their hypotheses about how the number system is organized and its regularities, as shown in the research of Lerner and Sadovisk (1996), are ignored in a context where apparently only school content is relevant. Moreover, the skills involving numbers as a code (since it is not limited to quantification) are only foreseen in the 1st grade, as if dealing with numbers as a code is not relevant for students from 2nd to 5th grade.

As far as skills involving "numbers" are concerned, only skill EF01MA04[5] indicates counting situations in "situations of interest such as games and play", and

[5] Skill EF01MA04 provides: "Count the quantity of objects from collections up to 100 units and present the result by verbal and symbolic records, in situations of their interest, such as games, play, classroom materials, among others." (MEC, 2018, p.279)

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other skills that indicate counting do not include in the text the relationship with situations of real use of mathematics.

After the publication of the BNCC (MEC, 2018), the Ministry of Education and Culture (MEC) provided ancillary material, organized in an editable table of the BNCC, entitled "Orientations/Mathematics BNCC- Elementary School[6]", in which the thematic units, objects of knowledge and skills appear, followed by ancillary material for the curriculum writer, with comments and indications of possibilities for the curriculum.

This material describes each skill and gives some indications for the construction of curricula based on the proposed basis. These hints include explanations of each skill and, in some cases, examples of what is expected to be covered in the curriculum. In the comments of the skills of the thematic unit Numbers, there are indications that reiterate aspects mentioned in the text of the BNCC (MEC, 2018), such as some indications of games, play and the use of everyday objects and number carriers, especially in the skills provided for the first year.

It is noted that mathematical literacy is presented as including the ability to reason, communicate and argue mathematically, emphasizing the potential of mathematical knowledge in the formation of critical citizens, aware of their social responsibilities and their actions in the world. However, the perspective of mathematical literacy is very subtle in the proposed skills, as well as in the indications of possibilities for the curriculum. This becomes clear when analyzing the verbs that make up the skills presented, as shown in the table below:

Chart 2 - Verbs used in the BNCC Math skills - Beginning years of elementary school.

1º Year	2º Year	3º Year	4º Year	5º Year
Use	Compare	Read	Read	Read
Count	Estimate	Write/Record	Write/Record	Write
Estimate	Compose/Decompose	Compare	Sort	Sort
Compare	Build	Identify/Recognize	Show	Identify/recognize.
Count	Solve	Build	Solve	Represent
Constructing/Producing	Elaborate	Establish	Elaborate	Compare
Composing/Decomposing	Describe	Use	Use	Associate
Solve	Register/Draw	Solve	Recognize/Identify	Solve
Elaborate	Recognize/Identify	Elaborate	Determine	Elaborate
Organize/Order	Name/Indicate	Associate	Describe	Conclude
Relate	Measure	Understand/Interpret	Associate	Use
Identify/Recognize	Establish	Describe	Measure	Understand/interpret.

[6] Available at: http://download.basenacionalcomum.mec.gov.br/. Accessed on 12/03/2022. No reference from the authors of the comments and indications in this document could be found.

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Name	Classify	Classify	Estimate	Describe
Report/Describe	Perform (research)	Choose	Compare	Present
Classify		Estimate	Perform (research)	Determine
Read		Measure		Perform (research)
Perform (research)		Perform (research)		

Source: the authors

Despite the variety of verbs, it is possible to verify that most of them refer to procedures, actions to be developed in the use of mathematical information, on the other hand, there are few that enable the student to investigate, reason, communicate and argue. The supplementary material contains some references to the consideration of contextual situations, mentioning mathematical literacy in the references to skills EF02MA07, EF03MA26 and EF05MA18, relating it to the expression of students' reasoning and arguments. However, only in the indications referring to a skill planned for the 4th grade (FS04MA25), some kind of orientation was observed in relation to a work that stimulates a critical view in mathematics teaching based on everyday situations.

Looking at the procedures indicated as skills, it is noteworthy that some of the verbs coincide with actions involved in performing mechanical exercises in mathematics, such as "solve, identify, register, recognize, name, read, write and show". Although the exercise, as Zabala (1999) points out, is necessary for the mastery of a certain skill, it must not be understood as something mechanical, but in the sense that the student has enough experience with a certain procedure to be able to master it. \

This means, for example, that the analysis of some everyday situations in which the number appears cannot be limited to a single activity, but in proposals that allow this meaning to be considered in different situations, at different times, with different goals, discussing the similarities and differences of the contexts already analyzed. That is, other actions must be considered, such as discussing, reflecting, arguing and counter-arguing.

According to Zabala (1999), skills cannot be limited to knowing how to do (procedures). It is necessary to consider "knowing" and "being" as they are related to "knowing how to do". The author states that

> ...it would be impossible - didactic strategies or teaching activities in which we believe that the procedural content is learned or can be learned in a meaningful way separate from the conceptual and attitudinal content. There are two fundamental reasons that prevent us from making proposals based on content types. One is related to the meaning of learning: if we want what is learned to have meaning for the learner, it must be well related to all the components that intervene and make it understandable and functional. Thus, the mastery of a technique or an algorithm cannot be used conventionally if the reason for its use is not known, that is, if it is not linked to its conceptual components. For

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> example, the ability to calculate, the ability to add, is useless if one is not able to use it as a means of solving sum situations (conceptualization of the sum). Likewise, these two contents, procedural summation and conceptual summation, will be more or less powerful or achieved by the learner in a certain way, according to the attitudinal framework in which they were learned". (Zabala, 1999, p.8-9)

Thus, from the perspective of mathematical literacy, it is necessary to consider the use of concepts, procedures, facts and mathematical tools, from skills that involve representing, communicating, reasoning and arguing, favoring the development of conjectures, formulation and problem solving. Moreover, reflection on the actions and application in different contexts are part of this perspective, which refutes the idea of a school mathematics limited to training disconnected from social practices, which does not allow the formation of critical citizens aware of their social responsibilities.

Still on the skills presented in the BNCC, it is observed that there are several indications of the need for work in each axis of mathematics. However, the text does not indicate any relationship with everyday situations, restricting itself to the description of content to be explored. As can be seen in the examples below:

> (EF01MA06) Build basic addition facts and use them in calculation procedures to solve problems. (MEC, 2018, p.279)
>
> (EF03MA14) Describe characteristics of some spatial geometric figures (prisms, straights, pyramids, cylinders, cones) relating them to their planification. (MEC, 2018, p. 287)
>
> (EF05MA04) Identify equivalent fractions. (MEC, 2018, p.295)

The question does not refer to the relevance of working with the skills listed, but to the fact that if only the lists of skills are considered, there is a risk of reinforcing the teaching of traditional, mechanistic mathematics, disconnected from the mathematical knowledge used outside school, i.e. the old reality of a school mathematics (used only in school) parallel to the mathematics of real life. Nacarato, Mengali & Passos (2009, p.32) point out that the results of external examinations show that "... calculation skills are not enough because they do not meet the demands of contemporary society", that is, mathematics that ignores the social context does not seem to be sufficient for the formation of an active citizen in society.

As for the references to skills that involve solving problem situations through personal and/or conventional strategies, they do not show the relationship of these problems to everyday situations and can only be interpreted or proposed through school problems that contribute little or nothing to mathematical literacy. The text refers to "solving and elaborating problems..." but without any reference to the relationship of these mathematical problems to real situations. The emphasis is on "solving", on arriving at a result, even if there is no reflection on the meaning of the result, which does not correspond to the competences foreseen in the document itself, which include

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understanding (mathematical) phenomena, constructing meaningful representations and reasoning consistently in different contexts.

For example, analyzing the competency (EF02MA08) "Solve and elaborate problems with double, half, triple and third parts, with the support of images or manipulative materials, using personal strategies." (BRASIL, 2018, p. 283), a proposal to exploit this skill, ignoring the perspective of mathematical literacy, could take advantage of a typical school "problem situation" such as:

> *Pedro picked 367 mangos and Joaquim picked twice that amount. How many mangoes did Jack pick?*[7]

In this example, it is possible to raise some questions: is the harvest something from the students' context? Is the mango? In the context of actual practice, do we encounter situations involving the double in this way? It is worth pointing out that considering that in our country there are very different realities (in different neighborhoods, cities and states), it is necessary to pay attention to vocabulary, actions and practices that make sense in the reality of this context, as Skovsmose points out:

> (...) several criteria can be used to select such problems. The two fundamental criteria are the following. The subjective: the problem should be conceived as relevant from the students' perspective; it should be possible to frame and define the problem in terms close to the students' experiences and theoretical framework. And the objective: the problem should have a close relationship to objectively existing social problems." (Skovsmose, 2001, p.19-20).

In the complementary material "BNCC Mathematics Guidelines - Elementary School", in the possibilities for the curriculum regarding the aforementioned skill, counting, problems and exploration of simple recipes are suggested for working with this skill. In fact, there are several contexts in which we need to deal with these concepts in everyday life (double, triple, half, third part). A situation that would have the potential to explore the skill mentioned within the perspective of mathematical literacy (considering the urban context) could be from situations in which this language appears in everyday life, familiar to students, as in advertisements of "double" promotions, for example:

[7] Source: https://acessaber.com.br/atividades/atividade-de-matematica-problemas-com-dobro-triplo-quadruplo-e-quintuplo-4o-ano/ Accessed on 05/17/2019

Figure 1 - Snack bar advertisement

Source:https://www.circuitodenoticias.com.br/noticia/7649/quarta-em-dobro-e-a-promocao-do-dia-no-ney-lanches. Accessed on 05/17/2019.

Figure 2 - Internet Service Provider Advertisement
Source:https://grandesnomesdapropaganda.com.br/anunciantes/com-ivete-sangalo-vivo-lanca-segunda-fase-da-campanha-giga-chip/.m Accessed on 09/25/2019.

From these examples, it is possible to visualize the possibility of exploring the student's reflection. When buying one and taking two snacks, on which days, in which place, with what value; or when estimating a data package, paying for 5GB, 10GB, 50GB, how much time would be available for Internet use (allowing a discussion about excessive Internet use). The relationship between everyday experience and critical analysis of social issues, in this case related to consumerism and the use of technology (the Internet), has great potential to contribute to mathematical literacy.

Thus, if in a "school-oriented" problem the answer is usually limited to the result of a calculation, a problem from the perspective of mathematical literacy allows relating the situation to personal experiences, analyzing different mathematical data, conjecturing, communicating ideas, reasoning, arguing and critically interpreting the results found. In this sense, working with the above-mentioned skill (EF02MA08) would not only be a content to be worked on, but also a means of promoting the development of strategies and ways of reading the world, thus contributing to the development of the competences foreseen in the BNCC.

It should be noted, however, that it is not a matter of working with skills in order to "develop" mathematical literacy, but, on the contrary, of working taking into account the context of the social practices in which they are involved, the different languages that mathematics presents and the critical reflections of mathematical interpretations, thus enabling the development and improvement of different skills. Thus, mathematical literacy should permeate different skills and different areas of knowledge, in an interdisciplinary perspective and with the aim of contributing to "reading the world". According to D'Ambrósio,

> Everyday life is impregnated with cultural knowledge and actions. At every moment individuals are comparing, classifying, quantifying, measuring, explaining, generalizing, inferring and, in some way, evaluating, using the material and intellectual instruments that are proper of their culture. (D'Ambrósio, 2007, p.22)

There is another relevant point when analyzing the categories related to the consideration of students' knowledge regarding everyday life and the indication of numerical carriers and/or everyday textual genres that make use of mathematical

language. It is observed that, although the document cites some information, the approach to such issues is insufficient.

About number carriers and textual genres involving mathematical language

Given the concept of mathematical literacy that involves working with the mathematics found in everyday social practices, and considering that most of these practices are presented through different types of texts, being literate in the field of mathematics involves dealing with the mathematical language that is presented in different contexts and in different ways in the social environment, which includes a variety of textual genres that make use of this language and that people encounter frequently.

Thus, in this perspective, it would be possible to point out the need to work with this textual variety. For example, if we look at the field of Portuguese language, the BNCC deals quite explicitly with the exploration of different textual genres, as indicated by the skills, for each year cycle. As for the textual genres involving mathematical language or numerical supports, the following indication is observed when analyzing the document.

Chart 3- Textual genres/numerical carriers indicated by the BNCC in the area of Mathematics.

1º Year	2º Year	3º Year	4º Year	5º Year
Games *	Images	Sketches	Images	Calculator
Playing*	Routes	Mockups	Calculator	Tree Diagram
Room materials*	Plans	"Various measuring instruments "**	Maps	Tables
Pictures	Calendar	Labels	Floor Plans	Graphs (column, pictorial, line)
Calendar	Agenda	Packaging	Sketch	
Coins and banknotes (money)	Digital Clock	Clocks (analog and digital)	Column chart	
Tables	Coins and banknotes (money)	Double-entry table	Simple and double-entry table	
Column charts	Tables	Graph (bars and columns)		
	Column charts	List		
	List			

Source: Prepared by the authors.

* Games, games and materials of the room, were considered as numerical carriers in this research, for their playful character and/or very present in the everyday life of children (especially in the early years) and that present numerical records or counting situations.
** We consider that conventional measuring instruments are also numerical carriers (scales, ruler, tape measure, measuring cups, thermometer, etc.).

It is important to point out that a large amount of information circulates in today's society and mathematical language is present in a variety of situations in everyday life. D'Ambrósio (2004) points out some examples of daily routine situations that students should learn to handle:

-reading and critical interpretation of newspaper and television news;

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> -interpreting the social moment through soap operas, movies, soap operas, talk shows, etc.;
> -ability to locate oneself with increasing precision (street, number, neighborhood, zip code, telephone, distances from home to school, travel time, evaluation of time spent on transportation in a day, month, year, in a lifetime) and reading maps and international synopses;
> -management of personal economics (costs, currency, family, state budget);
> -understanding demographic issues (population, quality of life indices, etc.);
> -processing data about the body (height, weight, etc.);
> -organization and interpretation of tables, thus beginning the perception of what statistics and probability are.
> Developing the individual's ability to observe these situations, compare and classify them, and thus make sense of them in his or her life, is the great goal of schooling. (D'Ambrósio, 2004, p.46)[8].

Of course, not all situations presented are specifically for children, but this does not prevent children from observing this mathematical language in use, raising hypotheses, relating it to their knowledge, and using such information to build new knowledge. According to Fonseca (2014)

> "...we must assume the commitment to develop a pedagogical action that helps children understand the ways in which this society organizes, describes, appreciates and analyzes the world and the experiences in it. Only then, they will be able to understand the texts that circulate in this society, the function that these texts play and the effects they want to cause, and also to produce their own texts according to their own intentions." (Fonseca, 2014, p.28)

Similarly, Toledo (2004), when dealing with the role of the school in the process of numeracy, presents a series of everyday contexts that people encounter and that can be explored at school:

> preparing shopping lists, checking the expiration date of products to be purchased, comparing prices before buying, checking water, electricity or telephone consumption, looking for the week's offers in flyers and newspapers, buying on credit, writing down debts and expenses, checking change, checking bills and receipts, making or checking bills or service budgets, paying bills in banks or lottery offices, writing down telephone numbers, checking the time on digital or handheld clocks, reading the package insert of a medicine you bought, and reading manuals to install domestic appliances, are tasks that are part of the daily lives of these subjects. .. (Toledo, 2004. P.97)

[8] It is important to call attention to the fact that in 2004, the most popular media were newspapers and TV and, in these, talk shows, soap operas, and newscasts. But nowadays the most common means of information involve the Internet - digital news channels and social networks, as well as messaging apps.

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Thus, it is evident that the more the school is able to explore the different situations and the different carriers/ textual genres in which the mathematical language is present, the more possibility of offering a teaching in which mathematics also makes sense outside school, which allows students to interpret, reflect and argue based on mathematical knowledge in different everyday situations. In this sense, it is necessary to consider that working with mathematics goes far beyond mastering the Decimal Numbering System and operating the four operations. As stated by Fonseca (2014):

> *The Mathematical Literacy* that is proposed here, as it is concerned with the diversified practices of reading and writing that involve children and with which children are involved - in the school context and outside of it - refers to the pedagogical work that contemplates the relations with space and shapes, processes of measurement, registration and use of measures, as well as strategies for production, meeting, organization, registration, disclosure, reading and analysis of information, mobilizing procedures for identification and isolation of attributes, comparison, classification and ordering.
>
> Such relationships, processes and strategies should be contemplated in situations meaningful to children. Such situations often arise as a consequence of the students' confrontation with different types of text. Even without having mastered the technology of reading and writing, children are confronted with these texts in various activities of social life and establish different ways of relating to them. (Fonseca 2014, p.31)

However, what we see in the BNCC for the development of skills in dealing with different numerical media or textual genres of everyday life seems inadequate in view of the numerous possibilities for exploring the mathematical language that students encounter in and out of school. It is worth noting that although the BNCC is a guiding basis for curricula, the fact that it does not make explicit the variety of possibilities for exploring the contexts that mathematics should involve shows little concern for the real consideration of these contexts.

In the complementary material, some indications are observed that can contribute to the construction of curricula, in some examples involving textual genres and numerical carriers, such as: copy of personal documents, water and electricity bill codes, packages, sticker album, telephone numbers, texts of wide circulation (printed media, campaign, applications, electronic games, spreadsheets and music). On the other hand, such material does not provide guidance for the exploration of critical thinking, an inherent aspect of mathematical literacy.

It is not expected that the whole curriculum will be covered in the base, because this is not its function, but, as happened in the Portuguese language area, some textual genres and numerical carriers involving mathematical language have already been indicated in the skills, as a reference to the work in the early years.

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Finally, it is worth noting that even though many of the texts and supports mentioned do not present the child as the target in the real use of them, it is necessary to consider that they participate in several situations in which they observe the mathematics present in these texts or supports, form their own hypotheses, question and are motivated by the discoveries. Using these situations to explore everyday mathematics with students has the potential to encourage them to make connections, to expand their repertoires and, above all, to realize that the mathematical language of real life is related to the one taught in school, thus contributing to their insertion into the social practices of everyday life. In this sense, mathematics can truly contribute to the formation of autonomous citizens in "reading the world".

Final considerations

In analyzing how mathematical literacy is addressed in the BNCC, it can be seen that the document is aligned with this concept in some places, especially in the presentation text of the mathematics domain, but there is little evidence of this perspective in the proposed skills. In addition, there is little evidence of consideration of the knowledge and wisdom that students bring from their social contexts, as if mathematical knowledge were exclusive to the school context. It is worth pointing out that there is no way to consider everyday mathematics without considering the knowledge and wisdom of students and the school community. Ignoring the knowledge that students bring with them tends to reinforce the separation between school mathematics (which is learned and used only in school) and its applications in everyday life (the mobilization of knowledge in different everyday situations, especially outside of school). Another point inherent to the perspective of mathematical literacy, present in the initial texts of the document but little considered in the skills, refers to the development of a critical eye, which in fact allows the formation of citizens capable of reflecting and evaluating critically and ethically on social issues.

Even if the skills indicated are only a basis for the construction of the curriculum proposals, there is a risk that they become a list of contents to be worked on during the year, disregarding the initial indications of a work with mathematics based on its application in society and that contributes to the formation of critical citizens, aware of their social responsibilities. What can be seen is that the BNCC in itself does little to help teachers know the perspective of mathematical literacy and does not encourage them to consider this perspective in the development of school curricula and, consequently, in the pedagogical practice developed.

Finally, the fact that there is little evidence of mathematical literacy in several skills mentioned in the document requires that teachers have a deeper level of knowledge so that this perspective can actually be considered in the planning and pedagogical work developed.

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Thus, it will be necessary to look at the knowledge of the teachers regarding mathematical literacy so that this perspective can actually be part of the curriculum proposals built from the BNCC.

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