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Mathematical Literacy and Transdisciplinarity: investigation of interrelationships Contemplated in the National Common Core Curriculum Base

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***Abstract*:** This article theoretically investigates correspondences between the principles of Transdisciplinarity and the concept of Mathematical Literacy due to the need to reformulate the usual Mathematics teaching practices, which result in precarious learning for Brazilian students. Based on this investigation, in parallel, we present the results of a bibliographic mapping of national articles published between 2018 and 2021, interrelating ideas on Mathematics, Transdisciplinarity, and the National Curricular Common Base (BNCC in Portuguese), to identify Mathematical Literacy improvements. The results revealed that Mathematical Literacy can be transdisciplinary in BNCC as long as there is a development of skills such as self-management and teaching of Mathematics approaching contents in a transversal and multi-referential way. For future works, we suggest that studies deeply investigate aspects of Transdisciplinarity contained in the BNCC in the area of Mathematics, as well as studies applying such aspects in pedagogical experiences of Mathematical Literacy.

***Keywords*:** BNCC. Mathematical Literacy. Transdisciplinarity.

Alfabetización Matemática y Transdisciplinariedad: investigación de interrelaciones contemplado en Base Nacional Común del Currículo

***Resumen*:** Este artículo investiga teóricamente las correspondencias entre los principios de Transdisciplinariedad y el concepto de Alfabetización Matemática debido a la necesidad de reformular prácticas habituales de enseñanza de Matemáticas, que resultan en aprendizajes precarios para estudiantes brasileños. Con base en esta investigación, en paralelo, presentamos los resultados de un mapeo bibliográfico de artículos nacionales publicados entre 2018 y 2021, interrelacionando ideas sobre Matemática, Transdisciplinar y la Base Común Curricular Nacional (BNCC en portugués), para identificar mejoras de la Alfabetización Matemática. Los resultados revelaron que la Alfabetización Matemática puede ser transdisciplinar en la BNCC siempre que haya un desarrollo de habilidades como autogestión y enseñanza de Matemáticas abordando contenidos de forma transversal y multi referencial. Para trabajos futuros, sugerimos estudios que investiguen profundamente aspectos de la Transdisciplinariedad contenida en la BNCC en Matemáticas, así como estudios que

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apliquen tales aspectos en experiencias pedagógicas de Alfabetización Matemática.

Palabras clave: BNCC. Alfabetización Matemática. Transdisciplinariedad.

Letramento Matemático e Transdisciplinaridade: investigação de inter-relações contempladas na BNCC

***Resumo*:** O presente artigo investiga, teoricamente, possíveis correspondências entre princípios da Transdisciplinaridade e o conceito de Letramento Matemático, devido à necessidade de reformulação das habituais práticas de ensino de Matemática, que resultam em precária aprendizagem dos estudantes brasileiros. Com base em tal investigação, paralelamente, apresenta os resultados de um mapeamento bibliográfico, o qual analisou artigos nacionais publicados entre 2018 e 2021, que inter-relacionam ideias sobre Matemática, Transdisciplinaridade e a Base Nacional Comum Curricular (BNCC), de modo a identificar o favorecimento do Letramento Matemático. Os resultados revelaram que o Letramento Matemático pode ser transdisciplinar na BNCC desde que haja desenvolvimento de competências como a autogestão e ensino de Matemática que trabalhe os conteúdos de forma transversal e multirreferencial. Para futuros trabalhos, sugere-se investigar profundamente aspectos da Transdisciplinaridade contidos na BNCC para a área de Matemática, bem como estudos para aplicar tais aspectos em experiências pedagógicas de Letramento Matemático.

***Palavras-chave*:** BNCC. Letramento Matemático. Transdisciplinaridade.

1 Introduction

According to D'Ambrosio (2008), Mathematics is a corpus of knowledge built throughout the history of humankind and civilizations, configured as peoples' strategy to understand nature and dominate it for survival and transcendence of their environment. Based on this definition, one can understand the importance of mathematics in both the academic enviroment and the world of work and the educational, cultural, and social scenarios.

This importance is not reflected in Brazilian schools since students have shown a dislike for Mathematics studies and low mastery of content (PACHECO and ANDREIS, 2017), which reflects on their poor performance in international and national assessments, such as the International Student Assessment Program (PISA) and the Sistema de Avaliação da Educação Básica [Basic Education Assessment System] (SAEB), respectively.

In the case of PISA, according to Lima *et al.* (2020), Brazil has had a poor performance in Mathematics when compared to the average of the countries part of the Organization for Economic Cooperation and Development (OECD), and an unsatisfactory performance and even lower than the bordering countries in South

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America, as evidenced by PISA results from 2000 to 2018.

Such a scenario of low achievement of our students in Mathematics can indicate the lag of the pedagogical proposals for teaching the subject because Mathematics has usually been didactically approached from a bookish, out-of-context, memoiristic, and reductionist scientific perspective. Thus, it results in something uninteresting and difficult for young people (D'AMBROSIO, 2012; DEMO, 2010).

This usual profile of Mathematics teaching has not reflected the advances that science and other areas of knowledge have shown throughout the 20th century and the beginning of the 21st century, which point to new ontological and epistemological bases and methodologies for the construction of knowledge within of a complex and transdisciplinary profile (MORAES, 2010; MORAES and BATALLOSO, 2015). An education with a transdisciplinary profile is one in which students can be mesmerized by school content so that they can appropriate this knowledge as something that makes sense and is useful in their lives (MORAES, 2010).

Given this, supporting the teaching of Mathematics on transdisciplinary bases can favor the so-called Mathematical Literacy, which is conceptualized as the individual ability to formulate, use, and interpret Mathematics in various contexts, according to the OECD (ARRUDA; FERREIRA, and LACERDA, 2020). Mathematical Literacy is one in which subjects build "bridges" between school content and everyday life (ORTIGÃO; SANTOS, and LIMA, 2018; RUE; FERREIRA, and LACERDA, 2020).

One possible way to reverse our students' low performance is through the curriculum reform provided by the advent, implementation, and adaptation of schools to the Base Nacional Comum Curricular [National Common Core Curriculum Base] (BNCC), from the year 2018. Authors such as Costa, Sousa, and Cordeiro (2020) state that, for Mathematics, the Base represents a paradigm shift since it enables a curriculum of interconnected knowledge, with emphasis on the reflection and interpretation of information and stimuli for active learning of students through research and the exercise of citizenship. This implies changes in the approach to school content and in the pedagogical practices of teachers who teach Mathematics.

So, in that context, based on the assumptions that a Transdisciplinary Mathematics Education can support the formation of Mathematical Literacy competencies and the possible scientific and educational advances that the BNCC

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presents, we ask: How has this curricular reform contemplated the aspects of Transdisciplinarity aiming to develop the mathematical literacy of students?

Since the BNCC is a recently approved document disseminated in schools and academic centers, researchers, teachers, and managers continue studying the interpretation of its guidelines for Mathematics. These investigations aim to analyze the document and its possible applications in developing curriculum and pedagogical practices in Mathematics.

Thus, this article[4] aims to understand how research that deals with the BNCC guidelines in Mathematics identifies and discusses the principles of Transdisciplinarity included in the Base, aiming at developing Mathematical Literacy.

To achieve the proposed objective, we undertake two actions: the first is to conceptualize Mathematical Literacy, Transdisciplinarity, and to seek interrelationships between both. The second action consists of investigating, through a bibliographic mapping, along the lines of Lakatos and Marconi (1992) and aided by the methodological principles of the Discursive Textual Analysis, according to Moraes (2003), articles published in a period of four years (2018-2021) that include Transdisciplinarity themes addressed in the BNCC for Mathematics teaching and its possible correlations with Mathematical Literacy.

Given the above, we summarize this study as follows: Section 1 contains the introduction, and Section 2 discusses the main themes of this study, i.e., Mathematical Literacy and Transdisciplinarity. In section 3, the methodology used in the research is described. Section 4 reveals the obtained data and covers the analysis. Finally, section 5 entwines the considerations of this research.

2 Mathematical Literacy and Transdisciplinarity

The idea of Mathematical Literacy may differ between authors, depending on how they conceptualize what literacy is. In an attempt to promote a consensus among some different views on the subject, it is understood as the ability to analyze, reason, communicate, and be able to apply mathematical knowledge to solve not only school problems, but also to help in the challenges that arise in other social contexts

[4] This article includes some excerpts from a doctoral thesis, defended in the Graduate Program in Education at the Federal University of Ceará, written by one of the authors of this work.

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(GALVÃO and NACARATO, 2013; AGUIAR and ORTIGÃO, 2012).

This understanding of Mathematical Literacy is close to the definition conceived by the PISA program, which understands the use of Mathematics in the education of subjects to exercise citizenship from a conscious, constructive, and reflective perspective (ORTIGÃO; SANTOS and LIMA, 2018; RUE; FERREIRA; LACERDA, 2020).

According to what is argued about Mathematical Literacy, we understand that it can promote the learning of Mathematics as a living knowledge, which has meaning for students. Therefore, it is fundamental that the teaching proposals of this subject are effective in the sense that Mathematics is demystified and there is a satisfactory didactic transposition of its content (CHEVALLARD *et al.*, 2001). Thus, it is necessary to break with old proposals for teaching centered on the simple memorization of formulas, exposition of contents, and resolution of problems of a merely bookish nature, far from the students' daily reality.

Such conventional proposals for teaching Mathematics are closely linked to classical views of the construction of knowledge from a Cartesian matrix, which tend to fragment, compartmentalize, and decontextualize knowledge in different disciplines (DEMO, 2010).

Mathematical Literacy requires the consolidation and adoption of a new paradigm of knowledge, and in the context of the third millennium of humanity, Transdisciplinary stands out. This new paradigm presents better-structured bases in the so-called Manifesto of Transdisciplinarity, which was formulated in the First World Congress of Transdisciplinarity, held in the convent of Arrábida, in Portugal, in 1994, being defined as:

> [...] complementary to the disciplinary approach; it makes new data emerge from the confrontation of the disciplines that articulate them with each other; it offers us a new view of the nature of reality. Transdisciplinarity does not seek the mastery of several disciplines, but the openness of all disciplines to what unites and surpasses them [...] (SANTOS; GONÇALVES, and BALIEIRO FILHO, 2017, p. 43)

In summary, but without loss of generality, the principles that guide Transdisciplinarity are based on the assumptions of complexity and are configured with the rupture of simplistic and reductionist views of the subject, of the object of

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knowledge, the environment that surrounds it, and its interrelations in the construction of knowledge by disrupting the dualistic idea of right/wrong, false/true through the logic of the included middle (MORAES, 2010, 2015; NICOLESCU, 1999).

Within new epistemological, ontological, and methodological foundations, knowledge is constructed through logical operators of a complex nature, such as holography — the parts are in the whole and the whole is in the parts; circularity — the effects retroact on the causes and feed them; ecology of action — actions can escape the control of their authors and produce unwanted effects — (PETRAGILA and ARONE, 2015; MORAES and BATALLOSO, 2015; NICOLESCU, 1999).

From the transdisciplinary view, the reality is not perceived in a single way but diversified, based on multidimensionality and multireferentiality. These aspects are relevant when it comes to training the subject from a holistic and integrative view, through the formative triangle: self-education — the subject is responsible for the processes and purposes of his/her learning; heteroeducation — individuals learn and develop in the social and cultural environment through interaction with others; ecoeducation — the human being organizes the meaning given to their experience, produces knowledge through interaction with the physical environment and with the influence of culture and the person's imagination — (PETRAGILA and ARONE, 2015; MORAES, 2010, 2015; MORAES and BATALLOSO, 2015). Culminating the worked concepts,we understand that Transdisciplinarity:

> [...] is mainly based on respect and recognition of the individual's cultural identity in its various aspects and positions, not privileging and categorizing the multiplicity of being according to its material or intellectual attributes and properties. It is also based on the opening of the mutable being that, like the spoken language, it will diversify according to the situation, position, and reality with which it is confronted. (MONTOITE *et al.*, 2019, p. 41).

The principles of Transdisciplinarity entail a series of implications for education from a transdisciplinary vision, as argued by D'Ambrosio (2012); Machado, Silva, and Vieira (2017); Moraes (2010, 2015), Batalloso (2011) and Moraes, and Batalloso (2015, *apud* COSTA, 2018): the teaching and learning processes are permeated by a complex engineering between being and reality; in a complex and multidimensional way, constructed knowledge is just one of the possible representations of reality. Therefore, when teaching, one should consider what happens to the subject through his self-referential processes, life history, feelings, sensations, and emotions, as

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classrooms need to be thought of as spaces for coexistence and transformation.

Still, regarding the implications of Transdisciplinarity for education, innovative educational experiences must be provided, permeated by challenges, passionate, emotionally healthy, and welcoming. It is necessary to develop educational experiences that involve corporeality through breathing exercises, meditative practices, images and sounds for pleasant, creative, and positive feelings and thoughts. Learning spaces need to be designed so that identities can be configured and citizenship can be built (D'AMBROSIO, 2012; MACHADO; SILVA, and VIEIRA, 2017; MORAES, 2010, 2015; BATALLOSO, 2011; MORAES and BATALLOSO, 2015 *apud* COSTA, 2018).

Given the educational implications of the transdisciplinary paradigm, one of the possible ways to carry it out in Mathematics Education has been the field of Ethnomathematics, according to the assumptions of D'Ambrosio (2018), who explains that it understands Mathematics from a multidimensional perspective, with the recognition that different cultures have different ways of dealing with everyday situations and problems and explaining facts and natural and social phenomena.

In the ideals of D'Ambrosio (2018), Silva and Costa (2021) argue that Ethnomathematics is not opposed to Mathematics, but only recognizes that in all cultural groups, there is a mobilization of mathematical ideas, which is linked to the development of strategies to solve problems linked to the perpetuation of the human species. The authors state that there is a need to rethink the curriculum of undergraduate courses in Mathematics to go beyond the simple mastery of specific contents so that it starts to value and integrate the different ways of mathematizing and giving life to existing mathematics.

The authors also argue that it is important to develop Mathematics teaching practices from the perspective of Ethnomathematics, the implementation of projects and the need to listen to teachers. Such a perspective requires adequate training, sensitivity to identify and apply cultural experiences and encounters that occur inside and outside the school environment, and teachers' willingness to experience more open, communicative, and less academic practices.

Another important aspect to be considered in an ethnomathematics teaching program is, according to D'Ambrosio (2018 *apud* ZAIDAN, 2020), consider the history

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of Mathematics, even if superficially, to understand how mathematical knowledge was born and built, and the role it played in history.

Zaidan (2020) and Montoito *et al*. (2019) state that thinking about teaching Mathematics from a transdisciplinary perspective requires investigative and creative methodologies developed so that there are questions and explorations of existing knowledge and search for new knowledge and practices.

To favor Mathematics teaching proposals from a transdisciplinary perspective, a viable path is the way the curriculum is built, understood beyond a technical construction, i.e., understood in a political contexture of diverse interests, to configure what will or will not be actually worked on in the pedagogical programs of the schools (PASSOS and NACARATO, 2018; SANTOS, 2018; LOPES, 2015).

With regard to curriculum issues of a transdisciplinary nature, Brazilian education, in the post-pandemic scenario of Covid-19 (2020/2021), resumed the discussion of the effective implementation of the BNCC in school areas, which consisted of facing challenges, among them the Base's failure to overcome the academic view of knowledge. On the other hand, in parallel, even though Transdisciplinarity presents structured epistemological bases, it is equivalent to an unconsolidated paradigm, therefore, still under construction in the 21st century.

Thus, detailed analyses of the content of the BNCC guidelines are challenging both to reveal evidence of how Transdisciplinarity will be developed in school Mathematics teaching and to favor Mathematical Literacy. The search to identify such indications occurred in the analyses of articles published in Mathematics teaching journals and congresses from 2018 to 2021. We will describe the methodology, the results, and the analysis in the following sections.

3 Methodological paths: method and procedures

The research is qualitative as it presents an interpretative bias of the investigation phenomenon (BOGDAN and BIKLEN, 1994) and exploratory, as it seeks to become familiar with the phenomenon to formulate the research problem and raise the hypotheses more precisely (GIL, 2008).

Such classifications are justified by the fact that the investigation analyzes sets of texts that require the researcher's interpretation to be included or excluded from the

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study, consisting of analyzing articles that investigate the content of the BNCC. It is a document recently approved and ratified by the Ministry of Education (MEC), still in the process of being implemented in schools, which consists of a subject to be explored in terms of content and how it will be interpreted and approached in classrooms, becoming the target of several investigations, both current and future, mainly regarding the themes of this research.

The data collection technique used was bibliographic mapping, according to the criteria of Lakatos and Marconi (1992). According to the authors, secondary data is used through the researcher's direct contact with what has already been published on a given subject, exploring a new focus or approach to the topic.

To Lakatos and Marconi (1992), the bibliographic mapping presents a set of four phases, which will be presented and described, and contextualized according to the problem that this study presented: 1) identification: the moment in which the researcher recognizes the relevance of the subject, delimits it, and discovers that the search can be performed through queries to physical or virtual library catalogs; 2) location: the researcher identifies the consultation sources that are related to the delimited subject; 3) compilation: systematically gathering references and other information on the subject under investigation; 4) filing: corresponds to recording the information collected during the compilation phase on cards, and organizing the data obtained using criteria.

Phases 1 and 2 of the research were contemplated in the delimitation of the problem, in which we investigated how the themes of Transdisciplinarity in Mathematics teaching were approached in the BNCC text, treated in specialized articles published in a period of four years (2018 - 2021), and which were made available on the open source data site for research: *Google* Academic.

As for phases 3 and 4, the collected data are gathered in a summary table, in which the information was organized according to the authors, article proposal, and content approach corresponding to this investigation theme. After selecting the collected articles, discussions were held in light of the theoretical framework.

According to the research carried out in *Google* Academic, an investigation uniting the words *Transdisciplinarity*, *Mathematics,* and the *BNCC* revealed a set of 3,409 references available on the research site mentioned between April 26 and May 8, 2022.

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As a criterion for filtering the articles to delimit the information to meet the study problem and develop the analysis of the collected data set, we sought to use some principles of the Discursive Textual Analysis (ATD), according to Moraes (2003). According to the author, the DTA focuses on a qualitative perspective of data analysis in the form of texts so that they can be rigorously and judiciously examined based on a triad of steps. Therefore, the DTA proves to be a relevant methodology for the analysis of the data obtained from the bibliographic mapping.

Step 1 of the DTA consisted of identifying units of analysis in the researched articles, locating paragraphs that showed evidence of solid cohesion between the three selected keywords, and translating into mapping excerpts from the BNCC guidelines addressing Mathematics and Transdisciplinarity. This step reduced the number of references from 3,409 to 5, demonstrating that paragraphs have the required cohesion. With these units of analysis in hand, step 2 of the DTA consisted of organizing them into categories that could classify the content based on characteristics of a transdisciplinary profile, such as some of the operators of complexity/Transdisciplinarity and aspects of the transdiciplinary formative triad.

From the bibliographical research data collection and organization, we performed step 3 of the DTA, which corresponds to self-organization, developing the metatext, i.e., the analysis and discussion of the data in the light of the theoretical framework and the objectives outlined. In section 4, the collected data will be presented and discussed.

4 Correlations between Mathematics teaching and Transdisciplinarity in the BNCC to favor mathematical literacy

Thus, based on the adopted filter, the execution of the described bibliographic mapping, together with steps 1 and 2 of the DTA, returned the data set available in Chart 1:

Chart 1: Collection of articles dealing with the topic *Transdisciplinarity in Mathematics teaching*, according to the BNCC guidelines, published between 2018 and 2021

Authors	Article proposal	Approach to the content according to the investigation carried out	Characteristics of the transdisciplinary profile of the article's content
Santana (2021)	It seeks to relate reflections on the general	In the set of competencies n. 6, related to self-	Self-education

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	structure of the Base Nacional Comum Curricular and its dialogue with the Mathematics classroom of Elementary School Final Years.	management, they can be addressed in the context of the mathematical concept, through Critical Mathematics Education and Ethnomathematics.	
Corrêa and Rocha Filho (2020)	It investigated the existing articulations between the transdisciplinary elements and the teaching practices related to the teaching of Statistics in the Final Years of Elementary School.	The BNCC prioritizes, as one of its skills, the use of probability to build a critical perception of everyday life.	
Graciani e Silva (2020)	It presents a discussion on how financial education can be approached in public elementary schools in Resende city, Rio de Janeiro.	This group of authors state that financial education is understood in the BNCC as a contemporary cross-cutting theme. This type of education can enable students to exercise their citizenship in terms of developing their social conscience.	Transversality and multireferentiality
Silva, Vasconcelos, and Frascaroli (2020)	It investigated the conceptions of teachers of different areas that teach in the Final Years of Elementary School about financial education regarding their approach and the methodologies used in the classroom.		
Giordano, Araújo, and Coutinho (2019)	It discusses the new perspectives for Statistical Education in Brazil as of the publication of the Base Nacional Comum Curricular (BNCC).	The BNCC presents guidelines for the articulation of Statistics and Probability with other curricular subjects and other fields of study of Mathematics itself, which seems to point to a transdisciplinary approach.	Multireferentiality

Source: *Google* Academic (2022).

According to information identified in the articles collected in *Google* Academic, we observed that Transdisciplinarity in Mathematics teaching, according to the BNCC, is connected with Ethnomathematics and Critical Mathematics Education when they provide opportunities for processes in which Mathematics can form critical reflective citizens through self-management, according to what Santana advocates (2021). Therefore, according to what we can understand, based on the investigation carried out, this is configured as a clue of Transdisciplinary Mathematical Literacy since self-management corresponds to self-education, which is one of the three pillars of the transdisciplinary formative triangle (PETRAGILA and ARONE, 2015; MORAES and

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BATALLOSO, 2015; NICOLESCU, 1999).

Self-management consists of a competence possibly developed through Critical Mathematics Education and Ethnomathematics that deals with the educational formation of individuals, far beyond the simple understanding of mathematical content. It refers to knowing how to use them for reflection and questioning reality, which is also a competence of Mathematical Literacy (GALVÃO and NACARATO, 2013; AGUIAR and ORTIGÃO, 2012; ORTIGÃO; SANTOS and LIMA, 2018; ARRUDA; FERREIRA and LACERDA, 2020; D'AMBROSIO, 2018).

Again, the BNCC reveals evidence that a proposal for Transdisciplinary Mathematics Education can provide education for citizenship and social awareness in students through financial education, as advocated by the authors Graciani e Silva (2020) and Silva, Vasconcelos, and Frascaroli (2020).

We note that financial mathematics can represent a path to Transdisciplinary Mathematical Literacy since it provides students with self-referential learning processes, and is also a means to work Mathematics from a multi-referential perspective, since financial education is a transversal topic, according to the Base (D'AMBROSIO, 2012; AXE; SILVA and VIEIRA, 2017; MORAES, 2010, 2015; BATALLOSO, 2011; MORAES and BATALLOSO, 2015).

A transversal and multi-referential Mathematics Education provides opportunities for the development of topics in a contextualized and interdisciplinary way, being favorable in the sense that subjects are able to apply Mathematics knowledge in different situations, therefore, conducive to mathematical literacy (GALVÃO and NACARATO, 2013; AGUIAR and ORTIGÃO, 2012).

Another indication of the promotion of Transdisciplinary Mathematical Literacy through the BNCC is the report made by Giordano, Araújo, and Coutinho (2019). The authors state that the Base presents guidelines for the articulation of Statistics and Probability with other curriculum subjects, which again constitutes working Mathematics in a multi-referential bias (D'AMBROSIO, 2012; MACHADO; SILVA and VIEIRA, 2017; MORAES, 2010, 2015; BATALLOSO, 2011; MORAES and BATALLOSO, 2015).

Additionally, Corrêa and Rocha Filho (2020) also argue that probability is seen in the BNCC for the critical perception of everyday life, being a topic also conducive to

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the formation of citizenship, which is interpreted as favorable to the transdisciplinary formative triangle, in what concerns self-education (PETRAGILA and ARONE, 2015; MORAES and BATALLOSO, 2015; NICOLESCU, 1999).

Thus, according to what has been discussed in the theoretical framework of this article and identified in the analysis of data collected from the bibliographical research of the articles that analyze the BNCC, Transdisciplinary Mathematical Literacy is the one in which Mathematics is approached from a transversal perspective so that mathematical knowledge is applied to solve problems inside and outside the school in a way that students can exercise citizenship.

Mathematical knowledge needs to emerge beyond the simple demonstration of formulas and theorems for them to be contextualized according to the social reality of individuals, emerging aspects of the multidimensionality and multireferentiality of knowledge, favoring skills with a transdisciplinary profile, such as the triangle self-education, hetero-education and eco-education.

5 Considerations

We expect, in this study, to have evidenced the Transdisciplinary Mathematical Literacy in the BNCC guidelines for Mathematics teaching.

The analyses revealed that the Base presents some of this evidence since the MEC document suggests approaches to Mathematics topics that promote a formation of multi-referential bias and enable students to develop their self-management, which can culminate in the formation of subjects with critical-reflective capacity.

Despite the identification of some evidence of Transdisciplinary Mathematical Literacy, the selected articles state that delimiting the themes treated in the journals that research the BNCC cohesively requires a long and exhaustive and meticulous work of many readings and cuttings of text fragments, which can lead to misinterpretation of its content, needing the support of other teams of researchers working on the subject. The alignment of the investigative technique with qualitative analysis *software* can be the target of other investigations that are more detailed and even differentiated from the bias adopted here.

We believe this research can be useful for those interested in investigating themes about Transdisciplinary Education in Mathematics teaching and its implications

in the BNCC guidelines and for other groups of scholars interested in the areas of curriculum and teacher education in the Mathematics field.

The text ends by suggesting that future research be carried out, investigating in depth the aspects of Transdisciplinarity contained in the BNCC guidelines for Mathematics and studies that can apply such aspects in pedagogical experiences to favor Mathematical Literacy.

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