NEW HIGH SCHOOL: CHOOSING THE NATURE SCIENCES TEACHING BOOK IN A STATE SCHOOL IN MATO GROSSO DO SUL

NOVO ENSINO MÉDIO: A ESCOLHA DO LIVRO DIDÁTICO DE CIÊNCIAS DA NATUREZA EM UMA ESCOLA PÚBLICA ESTADUAL DE MATO GROSSO DO SUL

NUEVA ENSEÑANZA MEDIA: LA ELECCIÓN DEL LIBRO DIDÁCTICO DE CIENCIAS NATURALES EN UNA ESCUELA PÚBLICA ESTATAL DE MATO GROSSO DO SUL

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ABSTRACT: Education is intimately linked to politics and culture, and as such, the school curriculum cannot or should not be understood only as a neutral set of knowledge. Thus, in order to meet the curricular changes, the teaching materials are changed, especially in the case of the Reform of High School (EM) and the implementation of the National Common Curricular Base (BNCC). The objective of this experience report is to describe the experience of the choice of textbooks by the pedagogical coordination of the PNLD of the EM during the Covid-19 pandemic, in a state public school in Mato Grosso do Sul (Brazil). The following considerations resulted: in view of the uncertainties of the new curriculum and the reduction of the workload, the teachers chose the textbooks mediated by the pedagogical coordination. We consider the silencing of the disciplines of Chemistry, Physics, and Biology to be worrisome, with the consequent reduction of the workload.

KEYWORDS: BNCC. PNLD. Formative Itinerary. Teacher Education. Curriculum.

RESUMO: *A educação está intimamente ligada à política e à cultura, e de tal modo, o currículo escolar não pode ou não deve ser compreendido apenas como um conjunto neutro de conhecimentos. Assim, para atender as mudanças curriculares, os materiais didáticos são alterados, principalmente tratando-se da Reforma do Ensino Médio (EM) e da implantação da Base Nacional Comum Curricular (BNCC). O objetivo deste relato de experiência é descrever a experiência da escolha dos livros didáticos pela coordenação pedagógica do PNLD do EM durante a pandemia da Covid-19, em uma escola pública estadual de Mato Grosso do Sul (Brasil). Resultou-se nas seguintes considerações: diante das incertezas do novo currículo e da redução da carga horária, os professores escolheram os livros didáticos mediados pela coordenação pedagógica. Consideramos preocupante o silenciamento das disciplinas de Química, Física e Biologia com a consequente redução da carga horária.*

PALAVRAS-CHAVE: *BNCC. PNLD. Itinerário Formativo. Formação de Professores. Currículo.*

RESUMEN: *La educación está íntimamente ligada a la política y la cultura y, como tal, el currículo escolar no puede ni debe entenderse solo como un conjunto neutral de conocimientos. Así, para atender los cambios curriculares, se modifican los materiales didácticos, especialmente en el caso de la Reforma de la Enseñanza Media (EM) y la implementación de la Base Nacional Común Curricular (BNCC). El objetivo de este relato de experiencia es describir la experiencia de la elección de libros de texto por parte de la coordinación pedagógica del PNLD de la EM durante la pandemia de Covid-19, en una escuela pública estatal de Mato Grosso do Sul (Brasil). De ello se desprendieron las siguientes consideraciones: en vista de las incertidumbres del nuevo currículo y de la reducción de la carga de trabajo, los profesores eligieron los libros de texto mediados por la coordinación pedagógica. Consideramos preocupante el silenciamiento de las disciplinas de Química, Física y Biología, con la consiguiente reducción de la carga de trabajo.*

PALABRAS CLAVE: *BNCC. PNLD. Itinerario Formativo. Formación del profesorado. Currículo.*

Introduction

Education is closely linked to politics and culture, so the curriculum cannot and should not be understood as being just a neutral set of legitimized knowledge, which appears in the texts and classrooms of a nation, from the selection of someone, of some group in a given time and space. It is the product of tensions, conflicts and cultural, political and economic concessions that organize and disorganize a people (Apple, 1994).

The curriculum can also be understood in a broader sense, as Goodson (2020) describes, as a set of discourses, documents, stories and practices that imprint identities on individuals involved in the school process. From this vision, curricular documents, such as the Education Guidelines and Bases Law (LDB) nº 9,394/1996 (Brazil, 1996), the National Curricular Guidelines for Secondary Education (DCN) (Brazil, 2018), the Parameters National Curricular Guidelines (PCN) (Brazil, 1999) and the National Curricular Guidelines for Secondary Education (OCNEM) (Brazil, 1998) and, more recently, the Common National Curricular Base (Brazil, 2017a), were created with systemic narratives that describe the ways in which school knowledge should be produced and mediated.

Particularly, with regard to Secondary Education (EM), even with the change of the government of Fernando Henrique Cardoso (PSDB) to that of Luís Inácio Lula da Silva (PT), in 2003, there was continuity between curricular policies, as Lopes points out. (2004), because the Ministry of Education (MEC) remained influenced by the same team that developed such policies.

The most impactful curriculum policy in recent years in Brazilian education was the BNCC (Brasil, 2017a). The construction of a curricular base is not a new issue in the country, as there was already a provision in Article 210 of the Federal Constitution (Brazil, 1988, p. 124): “Minimum contents will be established for elementary education, in order to ensure training common basic values and respect for national and regional cultural and artistic values”. However, the Common National Base terminology will appear in the amendment to LBD No. 9,394/1996 (Brazil, 1996), by Law No. 12,796/2013 (Brazil, 2013), which amended Article No. 26 (among other changes):

> The curricula of early childhood education, primary education and secondary education must have a common national base, to be complemented, in each education system and in each school establishment, by a diversified part, required by the regional and local characteristics of society, culture, the economy and students (Brasil, 2013, p. 1, our translation).

Regarding Law No. 12,796/2013 (Brazil, 2013), which amended Article 4 of LDB 9,346/96 (Brazil, 1996), it is worth highlighting the mandatory nature of EM, that is, only in 2013 did public education become "[...] free and compulsory basic education from 4 (four) to 17 (seventeen) years of age, organized as follows: **a)** pre-school; **b)** elementary education; **c)** secondary education [...]", less than a decade before this stage of education became mandatory (Brasil, 2013, p. 1, our translation).

Later, in 2014, the term "common national base of curricula" appears in the National Education Plan (PNE 2014-2024) (Brazil, 2014, p. 61, our translation), in strategy nº 7.1 of Goal 7, which deals with "[...] promote the quality of basic education in all stages and modalities, with improvements in the school flow and learning in order to achieve the following national averages for the Basic Education Development Index (IDEB)":

> [...] establish and implement, through inter-federative agreement, pedagogical guidelines for basic education and the common national basis of curricula, with rights and objectives for learning and development of students for each year of elementary and secondary education, respected regional, state and local diversity (Brasil, 2014, p. 61, our translation).

However, it was only in 2017, 21 years after the promulgation of LDB No. 9,394/1996 (Brazil, 1996), that it was modified by Law No. 13,415/2017 (Brazil, 2017b), and then includes mention of "*National Common Curricular Base*" (emphasis added).

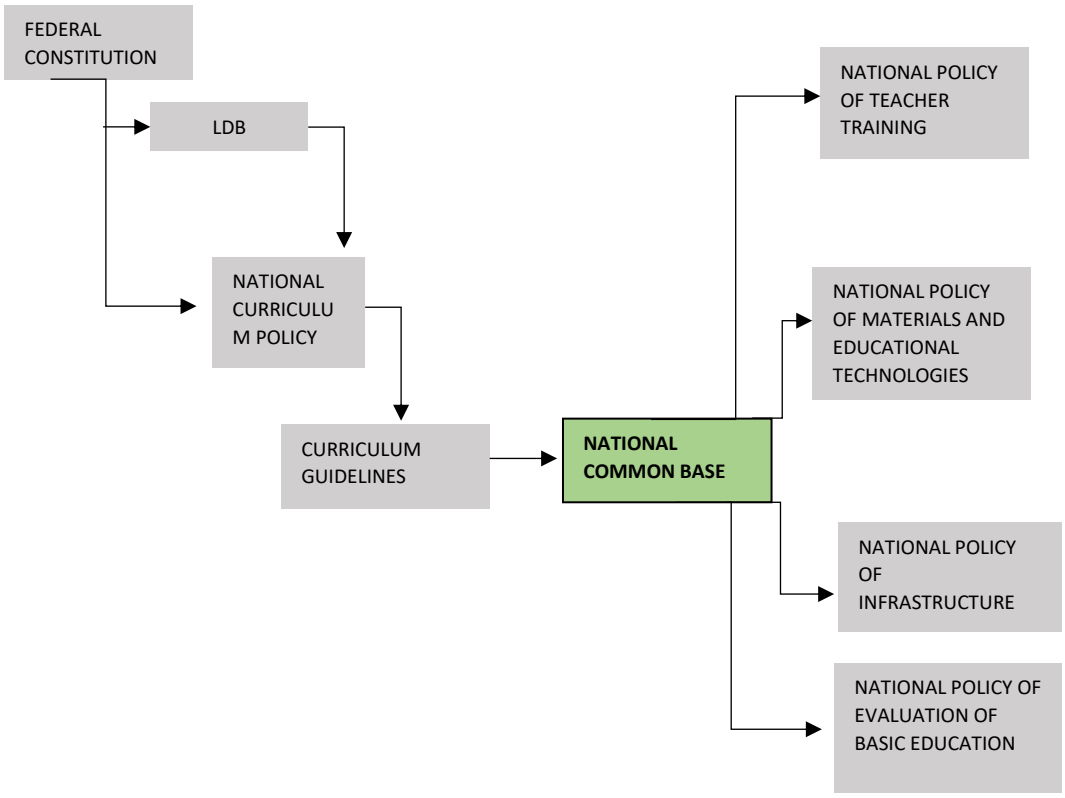
According to Silva (2018), the first act of Michel Temer's (PMDB) government upon assuming the Presidency of the Republic in 2016, after the turbulent impeachment process of then President Dilma Rousseff (PT), was the publication of Provisional Measure No. 746 /2016 (Brazil, 2016) which deals with the controversial "Secondary Education Reform", also based on Law no. 13.415/2017 (Brazil, 2017b), which occurred "[...] through a power relationship that guaranteed its approval in record time [...]" (Almeida, 2017, p. 93, our translation).

According to Rodrigues, Pereira and Mohr (2020), it is not new that changes and reforms are being carried out in education with the purpose of generating a progressive alignment between learning objectives to be achieved by students, systematized in curricular matrices and their assessment through standardized tests (the institution of the National Secondary Education Examination - ENEM), for entry into higher education and indirectly inducing changes in EM.

According to Figure 1, even though the BNCC (Brazil, 2017a) declares that it is not a curriculum, its direction towards numerous educational policies is noticeable, as described by Rodrigues, Pereira and Mohr (2020) regarding the structural linkage of policies in relation to

training of teachers, the national materials policy and educational technologies. Such structures were already present since the second version of the BNCC as a guiding axis (Brazil, 2016).

Figure 1 – Elements of educational policy guided by the second version of the BNCC



Source: Adapted from BNCC (Brazil, 2016, p. 26)

In Figure 1, the four policies that derive from the BNCC "[...] are articulated to guarantee the conditions that generate quality in Basic Education, that is, the right of Education students to learn and develop. Basic, welcomed in its diversity and from an inclusive perspective" (Brasil, 2016, p. 26, our translation).

Regarding its pedagogical foundations, the BNCC (Brazil, 2016) presents how curricular contents serve the development of skills. Knowledge, therefore, is legitimized from a pragmatic perspective, operated and applied in a situation. In this way, the idea of understanding reality critically, seeking its transformation, is transformed into developing a set of skills and competencies that the market demands from individuals (Vitiello; Cacete, 2021).

As a result, books and teaching materials were changed to meet the development of such skills. Through a brief retrospective, we observed that it was only in 2004 that the implementation of the National Textbook Program for Secondary Education (PNLEM) took place and that, initially, Mathematics and Portuguese language books were distributed, and it

was only in 2009 that the other curricular components began to be distributed to students (Vitiello; Cacete, 2021).

Also in accordance with Law No. 13,415/2017 (Brazil, 2017b), which provides for the High School Reform, in which only Mathematics, Portuguese, and English will be mandatory curricular components in the three years of EM and the others, such as Biology, Physics, and Chemistry that constitute the area of Natural Sciences and other components of the area of Human Sciences, will compose the "[...] training itineraries, which must be organized through the offering of different curricular arrangements, according to relevance for the local context and the possibility of education systems [...]" (Brasil, 2017a, p. 1, our translation). As recommended by Article 35-A of the aforementioned Law, the BNCC will define EM learning rights and objectives in the following areas of knowledge: I - Languages and their technologies; II - Mathematics and its technologies; III - Natural sciences and their technologies; IV - Applied human and social sciences (Brazil, 2017a).

Faced with such facts, we clearly see the "silencing or erasure" of the disciplines that make up the Natural Sciences (Physics, Biology, and Chemistry), which will need to be realigned based on the discourse of the interdisciplinarity of their knowledge. In this sense, the Brazilian Society for Teaching Biology (SbenBio) [5], the Brazilian Society for Teaching Physics (SBFísica)[6] and the Brazilian Society for Teaching Chemistry (SBenq)[7] issued notes of rejection of both the teacher training policy and the New High School curriculum proposals, as per the following example:

> The Brazilian Society of Chemistry Teaching (SBEnQ) hereby expresses its rejection of the *New Secondary Education proposal* by the Ministry of Education, which indicates the **DELETION OF THE CHEMISTRY DISCIPLINE FROM THE BASIC EDUCATION SCHOOL CURRICULUM** and, consequently, in the medium term the closure of Chemistry Degree courses. By bringing a false approach to interdisciplinarity and innovation, the *New High School proposal* is misleading and is not supported by current educational research discussions (SBENQ, 2021, p. 1, emphasis in the document, our translation).

In the context of the New High School and the BNCC curriculum, the objective of this article is to describe and analyze the experience of choosing Natural Sciences textbooks (LD)

[5]Available at: https://sbenbio.org.br/geral/nota-de-repudio-contra-a-portaria-no-412-de-17-de-junho-de-2021/. Accessed on: 10 Jan. 2022.
[6]Available at: http://www.sbfisica.org.br/v1/home/index.php/pt/acontece/1376-convite-para-o-webinar-formacao-docente-eo-novo-ensino-medio-nos -States. Accessed on: 10 Jan. 2022.
[7]Available at: https://sbenq.org.br/wp-content/uploads/2021/07/Nota-de-repudio_VERSAO-FINAL.pdf. Accessed on: 10 Jan. 2022.

by the pedagogical coordination of the EM of a state public school in the State from Mato Grosso do Sul (MS).

Therefore, this article is made up of the following sections: qualitative research methodology used in the construction of this text; the results achieved from the experience report of pedagogical coordination; and final considerations, in which we seek to contribute and discuss the choice of Natural Sciences textbooks at EM.

Methodology

This is a descriptive, qualitative study, of the experience report type, as guided by Lüdke and André (2010). The study arose from the initiative to describe and analyze the experience in the school environment of a complex demand, amid the Covid-19 pandemic, in view of the implementation of the High School BNCC (Brasil, 2017a) and the implementation of the Reference Curriculum (CR) from the State of Mato Grosso do Sul (Mato Grosso do Sul, 2021), by the pedagogical coordination and a teacher in the area of Natural Sciences from a state school in MS.

The choice of the LD took place from March to August 2021, and the pedagogical coordination was responsible for directing the number of volumes to be chosen and the first and second options from different publishers, in accordance with the guidelines of the State Department of Education of Mato Grosso do Sul (SED/MS) and with the recommendations published on the National Education Development Fund (FNDE) page[8]. The inclusion of the selection minutes in the system was the responsibility of the school management.

For the process of choosing the LD, some procedures were observed, for example, for Object 1 carried out in March 2021, which encompassed the following curricular components in interface with the Life Project discipline: Integrative Projects (Area of Languages and their Technologies, Mathematics and its Technologies, Natural Sciences and its Technologies and Applied Human and Social Sciences) and a text book for the Life Project curricular component.

For Object 2 – Areas of Knowledge and Specific Didactic Works, the choice took place between August 2021, the books of the Areas of Knowledge, for the components that have an

[8]The FNDE , a federal agency created by Law No. 5,537, of November 21, 1968 (Brazil, 1968) , and amended by Decree-Law No. 872, of September 15, 1969 (Brazil, 1969) , is responsible for implementing policies educational resources from the Ministry of Education (MEC). Available at : https://www.gov.br/fnde/pt-br/acesso-a-informacao/acoes-e-programas/programas/programas-do-livro/pnld/escolha-pnld-2021-2013-objeto -2-areas-of-knowledge. Accessed on: 15 Jan. 2022.

individualized textbook are: Mathematics and its Technologies, Portuguese Language, and English Language, being a single volume for the three years of EM.

For the areas of Natural Sciences and their Technologies, composed of Biology, Physics, and Chemistry and their Technologies, and Applied Human and Social Sciences, composed of Geography, History, Sociology, and Philosophy, they could choose six teaching volumes, to be distributed to three years of EM.

Even with the suspension of face-to-face classes at both times when the textbooks were chosen, teachers by area of knowledge were invited by the pedagogical coordination to discuss the proposals in person at the school and, given the facts, make the best possible choice of material.

The school management was informed via email sent by SED-MS regarding the deadlines and selection criteria, as well as the inclusion of the minutes of the choice on the portal of the Integrated Monitoring, Execution and Control System (SIMEC).

Results

Initially, it is worth highlighting that the years 2020 and 2021 were marked by the Covid-19 pandemic and the suspension of face-to-face classes, thus, in the State of Mato Grosso do Sul (MS), face-to-face classes were suspended through the Resolution of the Secretariat of State of Education No. 3.745, of March 19, 2020, which regulated Decree No. 15.391, of March 16, 2020. Given the facts, school activities were offered in the form of Complementary Pedagogical Activities (APCs) in school units and in centers belonging to the State Education Network. In this way, remote teaching can be offered in virtual environments, such as *Google Classroom*, *WhatsApp,* for example*,* or through printed activities for students to fulfill the school workload (Mato Grosso do Sul, 2020a; 2020b).

The first choice of textbooks for Object 1 - Integrative Projects and Life Project [9], took place in March 2021 and the second choice of textbooks for Object 2 - Curricular Components, took place in August 2021.

[9]According to Law 13,415/2017 in article 3, paragraph 7, the Life Project curricular component is described as follows: "high school curricula must consider the student's comprehensive training, in order to adopt work aimed at building their life project and for their training in physical, cognitive and socio-emotional aspects" (Brasil, 2017b, p. 1, our translation). Therefore, competence number 6 of the BNCC also includes "choices aligned with the exercise of citizenship and your life project, with freedom, autonomy, critical awareness and responsibility" (Brasil, 2018, p. 6, our translation).

However, the curricular changes and LD choices took place without the knowledge or contact with the Reference Curriculum - CR of the EM of the State of MS, on the part of the majority of teachers, as this curriculum was constructed in light of the BNCC (Brazil, 2017a) and approved by the State Education Council (CEE) (Mato Grosso do Sul, 2021). However, SED/MS Resolution No. 3,955 was published only on December 15, 2021 (Mato Grosso do Sul, 2021), which provides for the curricular organization and school regime of Elementary Education (EF) and EM of the State of MS, that is, at the end of the academic year. Previously, EM teachers had only had contact with SED-MS digital media through a video with a brief description of the constitution of the Training Itineraries of the curriculum[10] related to BNCC (Brasil, 2017a).

In this sense, it is necessary to highlight that the approach of publishers' representatives [11]and the receipt of materials (copies of publications) was frequent at the school, and publishers even provided pedagogues to assist with choices, as the process proved to be complex.

Even before the selection of textbooks began on the MEC portal, copies of books sent by publishers or personally delivered by their representatives began to be received. These, at the school unit, were very helpful, they handed out presentation cards, checked the materials received and made prior contact with the pedagogical coordination, sending digital materials and inviting people to lives and webinars with the authors or editors of the books to clarify the changes in the configuration. EM curriculum.

Such lives were interesting, because, with the Covid-19 pandemic and the suspension of most face-to-face activities, this technology became fundamental in the dissemination of knowledge and exchange of information. We also highlight that the publishers' representatives even established shifts to clarify doubts via *Google Meet* with an educator, in case the coordination or a teacher needed it.

In view of this, we can highlight that the PNLD market has become a millionaire for the Publishers that produce books for the New High School, as in 2019 alone it served 35,177,889 students in Brazil, through the distribution of almost 126 million copies that they cost just over 1.1 billion reais to the public coffers (Vitiello; Cacete, 2021; Brasil, 2020). This justifies the publishers' solicitude and advice towards schools.

[10]SED/MS. Available at: https://www.youtube.com/watch?v=69xhg9Dxbf0. Accessed on: 15 Dec. 2021.
[11]According to a report from the pedagogical coordination, representatives of the following publishers made contact or sent materials: Editora Moderna, Editora FTD, Editora IBEP, Editora Ática, Scipione, Saraiva, and Editora SM.

The authors Pinheiro, Echalar and Queiroz (2021) concluded, in their work regarding the logic of the PNLD notices, especially in Biology, that the way in which public policy is conducted favors the formation of oligopolies for teaching, increasing the achievement of profit from large business groups, which stigmatizes textbooks as merchandise.

As already mentioned, the choice of Object 1 LD took place in March 2021, and teachers were unaware of most of the curricular changes in the MS curriculum. The Life Project subject, implemented in 2020, did not have a clear syllabus and was taught by teachers without adequate training. Furthermore, it was presented to teachers as a very relevant curricular element for student training, becoming a worrying fact. This is clear in Article 3 of Law No. 13,415/2017, in § 7, which states: "Secondary education curricula must consider the student's comprehensive training, in order to adopt work aimed at building their life and for their training in the physical, cognitive and socio-emotional aspects" (Brasil, 2017b, p. 1, our translation).

How to consider the comprehensive training of EM students in the face of a curricular reform imposed by a provisional measure and without the knowledge or construction on the part of teachers? This reflection is carried out by Almeida (2017) in view of the neoliberal nature of such changes:

> The educational model that transfers to the individual the construction of their own life project, therefore they are largely responsible for their future, and the state does not need to worry about finding a job, it is up to each person within their faculties to be efficient enough to enter the job market in the best possible way. In the meantime, there is a reflection on those who do not have the minimum financial and social conditions to guarantee sufficient support for adequate human training for the society in which we live (Almeida, 2017, p. 92, our translation).

In view of this, we can see the great responsibility imposed on EM teachers, who, even without adequate training, must create ways to deal with this project with students, running the risk of being blamed if the referrals are not successful. It is worth noting that SED-MS presents on its page a series of publications [12]regarding Basic Education and mainly EM, with the aim of assisting teachers in their practices and pedagogical work.

When choosing the LD for Object 2 of the PNLD - Areas of Knowledge and Specific Didactic Works, the teachers' anguish and desire were about the workload of their subject and whether it would continue to exist. The teachers' reservations have foundations, explained by Vitielo and Cacete (2021) who highlight the role of national and international external agents

[12]State Department of Education of Mato Grosso do Sul. Available at: https://www.sed.ms.gov.br/institucional/publicacoes/. Accessed on: 19 Nov. 2022.

in the formulation of educational policies and curricular organization, a recurring practice in Brazil. On the other hand, the non-involvement of teachers, students and the school community in this process corroborates its rejection, as occurred with other prescriptive policies in the curricular field. The real curriculum takes place in the classroom and depends fundamentally on the decisions made by the teacher. In this sense, any decision about the curriculum must take into account the active participation of the teacher (Apple, 2013).

That said, each action, position and choice of the teacher is a political act, not neutral, which refers to the considerations about the curriculum proposed by Silva (1999, p. 14-15, our translation) "[...] what knowledge should be taught and [...] what knowledge or knowledge is considered important or valid or essential to deserve to be considered part of the curriculum?"

Whereas, the curriculum is not a neutral, innocent and disinterested body of knowledge, in which the main issue is not an epistemological validity of knowledge, whose issue is not knowing which knowledge is true, but "which knowledge is considered true" (Silva, 1999, p. 46).

However, according to Lopes (2019) and Apple (2013), it is neither necessary nor possible for the curriculum to be the same in all schools, because, when it is applied, it falls behind. The curriculum needs to make sense and be constructed contextually, to meet demands and needs that are not homogeneous. It is characteristic of any textualization, including curricular textualization, to be subjected to interpretation, being carried out in an unpredictable way. It is never a complete interpretation (pure difference), without reference to the text, it is never the supposed chaos of anyone understanding whatever they want. The role of a national curriculum should not be an end in itself but rather a process, that is, arising from the debate of what everyone does not agree on.

Regarding the speed of the EM reform, from its approval to its elaboration, according to Tarlau and Moeller (2020) they are called "Consensus for Philanthropy", when material resources, knowledge production, media power and formal and informal networks are used in support by private foundations.

For Mainardes (2006), who discusses the policy cycle approach to the analysis of educational policies, such as those formulated by Richard Bowe and Stephen Ball (1992), in which the context of influence is that in which, normally, public policies are initiated and political discourses are constructed, it is the *locus* of action of interest groups that compete to influence the definition of the social purposes of education and what it means to be educated.

Incidentally, we have seen the gradual disappearance of the idea of specific government policies in the fields of medicine, social work and education, as well as the merging of all three into a single policy idea, resulting in the increasing neglect or marginalization of the social purposes of education (Ball, 2001).

Thus, the BNCC (Brazil, 2017a) is the saturation point of curricular centralization policies in Brazil, a synthesis of curriculum policies since the PCN (Brazil, 1999), seasoned with the *common core* language of some countries (Cássio, 2018). For the author, a curriculum policy like the BNCC is by no means innocuous, as it aims precisely at transforming the roles of schools, students and teachers – and the relationships between them – in educational processes (Cássio, 2018).

The BNCC (Brazil, 2017a) is, therefore, the expression of an educational project for the country, and this should worry us.

> For the formation of human capital, there is a transfer of burden to the individual, "success" or "failure" depends solely on each person, which demonstrates the control of the market economy in our lives, in the way of living, already stamped those who cannot reach secondary education, as they are restricted to primary education, this discussion must permeate the academies [...] (Almeida, 2017, p. 93, emphasis added, our translation).

In this way, it is clear that the BNCC (Brazil, 2017a) provides countless business opportunities for private agents interested in what it derives from: new methodologies for large-scale assessments, production of teaching materials, teacher training programs for low cost and curricular flexibility in EM (especially in the niches of professional and technological education and distance education) (Cássio, 2018).

Amidst this whirlwind of information and decisions regarding how to choose the best textbook in times of remote teaching, as already reported, with adaptations to the New High School, a series of changes occurred for students, teachers and managers at this stage of teaching. With the "improvement" of EM or dissemination of interdisciplinary knowledge, students begin to exercise their leading role and build their Life Project and choose the knowledge they will delve into in the so-called Training Itineraries, establishing a new, more flexible curricular organization , which includes the BNCC (Brazil, 2017a).

However, SED-MS did not provide any training for teachers before choosing the LD, so that these professionals could understand the new format of the EM, in order to therefore choose the best LD possibility, given the Object 2. Therefore, there were several doubts and the choice was made "in the dark".

In the BNCC scenario (Brasil, 2017a), the LD is extremely important, as it will help teachers in organizing pedagogical work, in the selection and adaptations of content, with the appreciation of students' daily lives and their contextualization, as well as the lesson planning. It should be noted that choosing a quality textbook is necessary, as some of them may contain content described in an unsatisfactory way for students.

However, such choices may not consider the cultural and social plurality of students, as for Silva (1999), the school acts ideologically through its curriculum, even indirectly in disciplines considered technical, such as Natural Sciences, for example, acting in a discriminatory way and inclining people from subordinate classes to submission and obedience. That said, it thus contributes to the reproduction of social relations of production in capitalist society.

In this context, the authors Fontes, Lourenço, Messeder (2012), in an article entitled "The experimental representation of the Daniell stack in textbooks: a questioned error", report important information about possible mistakes in LD. For the authors, many teachers and students are unaware of some mistakes that occur in the representations of the books. Therefore, in this article, a discussion is opened about the error that occurs in the experimental reproduction of the stack and how they were presented in the LD. The work carried out also proposed a viable alternative for building the Daniell stack, showing the importance of a class in which students are active participants in the learning process.

Another report that allows us to understand the importance of the teacher's role in choosing teaching material refers to the authors Fernandes, Silva and Junior (2018). In this work, the Chemistry Degree Course at the Federal University of Goiás carried out an investigation into the teaching of the content of atomic models presented in textbooks adopted by public schools in the city of Goiás. It was observed that there is a semiotic exercise of representation of chemical symbols that precede the presentation of the concept of atom. However, the approach to atomic models is condensed into a single chapter. Due to this fact, it is observed that the approach requires the student to have a complex structuring of thought and that , without the teacher's mediation, learning the atomic concept can be an obstacle.

In Biology Teaching, particularly in Botany content, Farias *et al.* (2019), report that in several textbook collections analyzed, flaws were identified in the approach to some content or conceptual errors made during the didactic transposition process, when trying to simplify and/or generalize some explanations, and when maintaining a conservative stance in relation to the taxonomy and classification of some groups of plants, in light of the most recent changes in

phylogenetic systematics. The authors intended to facilitate students' understanding, but they developed erroneous information.

For Fiorese and Delizoicov (2015), LDs are not always dedicated to articulating the development of science with social, political, economic, religious, cultural, and ideological factors. Such factors are external to the scientific community; however, they have a great influence on scientific practice and the teaching and learning process.

So, among the books received at the school in question, the first option [13]from the Moderna publisher and the second option from the FTD publisher were separated for teachers to choose from the Natural Sciences and Technologies curricular components. As can be seen in Table 1, the collections are made up of six volumes with different themes.

Table 1 – Titles from the PNLD collections analyzed for the choice by teachers of the Natural Sciences curricular components and their EM Technologies at a state public school in Mato Grosso do Sul

Collection title	Authors	Collection Code	Code of Volumes and Themes
First Option Modern Publisher: Diálogo Natural Sciences	Kelly Cristina dos Santos	0196P21203	0196P21203133 Theme: The universe of science and the science of the Universe
			0196P21203134 Theme: Life on Earth: how is it possible?
			0196P21203135 Theme: Earth: a dynamic system of matter and energy
			0196P21203136 Theme: Energy and society: a necessary reflection
			0196P21203137 Theme: Human being: origin and functioning
			0196P21203138 Theme: Human beings and the environment: relationships and consequences
Second Option FTD Publisher: Multiversos Natural Sciences	Leandro Godoy, Rosana Maria Dell' Agnolo and Wolney C. Melo	0221P21203	0221P21203133 Theme: Matter, Energy and Life
			0221P21203134 Theme:

[13]The choice of PNLD by the school unit follows criteria that must be recorded in minutes and entered into the FNDE system by the School Principal, such as: two collection options from different publishers, names of teachers, coordinators, participating principals and publication of the Proof of Choice in the school, in an appropriate, public and easily accessible location for all members of the school community. Available at: https://www.gov.br/fnde/pt-br/acesso-a-informacao/acoes-e-programas/programas/programas-do-livro/pnld/escolha-pnld-2021-2013-objeto - 2-areas-of-knowledge. Accessed on: 21 Nov. 2022.

Movements and Balances in Nature
0221P21203135 Theme: Electricity in Society and Life
0221P21203136 Theme: Origins
0221P21203137 Theme: Science, Society and Environment
0221P21203138 Theme: Science, Technology and Citizenship

Source: Prepared by the authors

Due to the above, the school was awarded the first option of the textbook, as shown in Table 1. In the case of teaching the Curricular Components of Natural Sciences and their Technologies, an LD is necessary that brings, in a relevant, conciliatory way, integrating and interdisciplinary Chemistry, Physics, and Biology content into daily life, in a way that facilitates the understanding and absorption of knowledge mediated by teachers. This is no easy task, as it will be necessary to realign the initial and continuing training of teachers in these areas in accordance with the BNCC (Brasil, 2017a).

Final remarks

The mandatory EM is still recent in Brazil, less than a decade for so many modifications and adaptations, and consequently, it was the last stage of Basic Education to receive teaching material for all curricular components, amidst curricular reforms. The changes were very sudden, both for students and teachers, without adequate preparation to receive them and/or considering the different realities of Brazilians.

In Mato Grosso do Sul, the changes caused anguish and uncertainty among Natural Sciences teachers, due to the reduction in their teaching hours and the possibility of taking on Training Itineraries for which they were not familiar with the curricular syllabi. Given the choice of LDs made, we verified that there was no adequate preparation/training of teachers for the implementation of the New High School in the state. Previously, we reported on conceptual and didactic errors in textbooks in the Chemistry, Physics, and Biology curricular components, and the importance of the active and critical role of the teacher in the analysis of these teaching materials. In the case of this process, the choice was made without the necessary depth and clarity.

Furthermore, we consider the silencing of teachers of the curricular components that make up the Natural Sciences and their Technologies (Chemistry, Physics, and Biology) to be worrying due to the reduction in their workloads, the depletion of some knowledge necessary for the full training of the student and, also, the lack of adequate continuing education for the complex change in the curriculum proposed at BNCC (Brasil, 2017a).

In relation to initial training, it is necessary to rethink the entire structure of degrees in these areas, given that they must include the current BNCC, in which guidance for LD no longer exists by curricular component but by area of knowledge, as already indicated in Table 1. Thus, according to the Resolution of the National and Education Council/CNE Full Council/CP nº 2, of August 30, 2022 (Brazil, 2022, p. 1), the Bachelor's degree courses will have a deadline of four years for the "implementation, by Higher Education Institutions (HEIs), of the National Curricular Guidelines for the Initial Training of Teachers for Basic Education and BNC-Training".

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