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Understanding the textbook: Reflections in the field of mathematics education¹

MAZZI, Lucas Carato

Universidade Estadual Paulista (Unesp Rio Claro). Doutor em Ensino de Ciências e Matemática. ORCID: 0000-0003-3395-3724. E-mail: lucas.mazzi@unesp.br.

AMARAL, Rúbia Barcelos

Universidade Estadual Paulista (Unesp Rio Claro). Livre-docente em Educação Matemática. ORCID: 0000-0003-4393-6127. E-mail: rubia.amaral@unesp.br.

PEROVANO, Ana Paula

Universidade Estadual do Sudoeste da Bahia (UESB). Doutora em Educação Matemática. ORCID: 0000-0002-0893-8082. E-mail: apperovano@uesb.edu.br.

ANDRADE, Luciana Vieira

Professora nível V da Secretaria de Estado da Educação, da Cultura, do Esporte e do Lazer do Rio Grande do Norte (SEEC/RN). Mestre em Mestra em Ensino de Ciências Naturais e Matemática. ORCID: 0000-0002-4115-2989. E-mail: luvieira13@gmail.com.

Abstract: This theoretical essay presents reflections about the textbook (TB) as a material widely used in the teaching and learning of Mathematics, aiming to present a perspective on what constitutes a TB and the different roles it assumes in school practice. In this sense, we start from its understanding as a didactic, curricular, and school material to characterize it as a resource that is not neutral and central in disseminating formal knowledge that is the school's responsibility. Therefore, it is a component of its culture. We emphasize that the use of this material in the classroom mobilizes its different roles, namely: curricular, ideological-cultural reference, source of theoretical and methodological knowledge and scientific dissemination, as well as the role of the teacher in this particular resource, highlighting his critical performance when using TB in classroom practice, either with a reproduction character, adaptation, or improvisation. We conjecture that properly articulating TB-related attributes will favour the teacher's practice and assist in students' learning, directing educational institutions to a work that achieves their main objectives.

Keywords: Articulation of material and textbook. Role of the textbook. Teacher-textbook relationship. PNLD.

Compreensões sobre o Livro Didático: reflexões no campo da Educação Matemática

Resumo: Esse ensaio teórico apresenta reflexões acerca do livro didático (LD), enquanto material muito utilizado nos processos de ensino e de aprendizagem de Matemática, visando apresentar uma

¹ Adaptated of the chapter "Compreensões sobre o Livro Didático" (Amaral et al., 2022).

perspectiva sobre o que constitui um LD e os diferentes papéis que assume na prática escolar. Nesse intuito, partimos do seu entendimento como material didático, curricular e escolar, para caracterizá-lo como um recurso que não é neutro e que é central na disseminação dos conhecimentos formais que são de responsabilidade da escola e, portanto, é componente da sua cultura. Salientamos que o uso deste material em sala de aula mobiliza diferentes papéis, quais sejam: referencial curricular, ideológico-cultural, fonte de conhecimentos teórico-metodológicos e divulgação científica, bem como o papel do professor diante desse recurso particular, destacando-se a sua atuação crítica ao utilizar o LD na prática de sala de aula, seja com caráter de reprodução, adaptação ou improvisação. Conjeturamos que a articulação adequada dos atributos relacionados ao LD favorecerá a prática do professor e auxiliará no aprendizado do aluno, direcionando as instituições de ensino para um trabalho que alcance seus objetivos principais.

Palavras-chave: Articulação de Material e Livro didático. Papel do Livro Didático. Relação Professor-Livro Didático. PNLD.

Comprensiones sobre el Libro de Texto: reflexiones en el campo de la Educación Matemática

Resumen: Este ensayo teórico presenta reflexiones sobre el libro de texto (LT) como material ampliamente utilizado en la enseñanza y el aprendizaje de Matemáticas, con el objetivo de presentar una perspectiva sobre lo que constituye un LT y los diferentes roles que asume en la práctica escolar. En este sentido, partimos de su comprensión como un material didáctico, curricular y escolar para caracterizarlo como un recurso no neutral y central en la difusión del conocimiento formal que es responsabilidad de la escuela. Por tanto, es un componente de su cultura. Resaltamos que el uso de este material en el aula moviliza sus diferentes roles, a saber: referente curricular, ideológico-cultural, fuente de conocimiento teórico, metodológico y de divulgación científica, así como el papel del docente en este recurso particular, resaltando su desempeño crítico al utilizar LT en la práctica de aula, ya sea con carácter de reproducción, adaptación o improvisación. Conjeturamos que articular adecuadamente los atributos relacionados con la LT favorecerá la práctica docente y coadyuvará en el aprendizaje de los estudiantes, encaminando a las instituciones educativas hacia un trabajo que alcance sus principales objetivos.

Palavras-Clave: Articulación de material y libro de texto. Papel del libro de texto. Relación profesor-libro de texto. PNLD.

Introduction

Since 2004, Choppin (2004) points to the need to reflect on a more detailed look at the textbook due to its complexity and uniqueness. This essay uses this perspective to highlight how these books can be seen in mathematics education.

The term “textbook” refers to the memory of a physical image built in the school experiences of each individual (Valverde, 2002), in which this material has “its own attributes, recognized by the subjects who use it and by the society in which it circulates as

an object” (Escolano Benito, 2012, p. 35, our translation).

Concerning the educational sphere, several agents make up and participate in this space. In particular, teachers play a key role in maintaining this system. Linked to them, we have textbooks (TB and TBs) as the central resource in the classroom, whether to play the role of a content-based curriculum guide or as a compilation of activities, a source of information, an indicator of didactic trends, or other functions.

Textbooks participate in classroom practice in Brazil and much of the world. Indeed, each country has its own characteristics, and the elaboration and use of textbooks happen in a particular way, but research shows its importance in the teaching and learning processes.

In Brazil, textbooks are used in most public schools, non-profit communities, and confessional or philanthropic institutions that have an agreement with the public power, and their access is financed and made possible by the Brazilian Federal Government through the National Textbook Programme (PNLD²). In this programme, publishers submit textbooks to be evaluated by a technical committee appointed by the Ministry of Education (MEC). Based on the analysis, the committee prepares a guide with the essential information and characteristics of the approved works. This document leads teachers’, coordinators’, and school managers’ choices. After the selection, MEC and FNDE³ (National Education Development Fund) purchase and distribute them to students and teachers.

In this context of textbooks in classrooms nationally and internationally, we believe there must be research to broaden perceptions about this resource to contribute to its constant improvement and reflections on its use. Textbooks and their use in the classroom have been one of the focuses of our research group, teorEMa – Interlocutions between Geometry and Mathematics Education, for some years now, and this text reflects some investigations we have conducted, the result of which we share here.

We aim to present a perspective on what constitutes a textbook and its different roles in school practice. Teachers and students constantly use this resource, but what characterizes a book for us to call it “didactic”? Is it a representation of the curriculum? Is it neutral, or

² For more information on public policies regarding Textbooks, see Mazzi (2018) and Mazzi and Amaral-Schio (2021).

³ The FNDE is responsible for implementing the educational policies of the public basic education network.

does it bring (implicitly or explicitly) values assumed by the authors/editors? How can the teacher use this material? These questions, among others, guide this article in the hope that it will encourage reflections and debates on this topic, which is so relevant to teaching practice and research.

Designations for textbook

The term textbook is neither precise nor stable. On the contrary, it is complex and fluid (Johnsen, 1993). The literature related to this topic has revealed the use of different terms to designate them, such as: didactic resources, pedagogical materials, didactic materials, pedagogical resources, teaching aids, curriculum materials, educational materials, instructional materials, and school materials, among many others.

We understand that these terminologies may come from theoretical perspectives researchers assume, and we recognize their importance for understanding textbooks and their relationship with the educational process. We do not intend, however, to clarify and scrutinize the meaning of each of these expressions. Instead, we aim to elaborate on a relationship between didactic materials, school materials, curricular materials, and the textbook.

In the 14th edition of the book *Introdução à Didática Geral* [Introduction to General Didactics], originally published in the 1960s, Nérici (196?, p. 410) stated that the

[the] didactic material is, in teaching, the liaison between words and reality. Ideally, all learning should take place in a real-life situation. However, if this is not possible, the didactic material aims to replace reality, representing it in the best way to facilitate students' insights.

To the author, the textbook enables the representation of reality in a way that helps students, motivating them in their learning. This idea clarifies the epistemological meaning of the term, i.e., beyond informing which materials, physical or otherwise, could be called didactic materials, it mentions their role in the teaching and learning processes.

This conception suggests that the materials are responsible for illustrating the content and for leading students to investigate, discover, elaborate, and build, assuming, then, a

“functional and dynamic aspect, providing an opportunity to enrich the student’s experience, bringing them closer to reality and offering them the opportunity to act” (Nérici, 196?, p. 412).

Based on these ideas, we understand that the didactic materials can contribute to the teacher’s work, expanding the possibilities of resources for their practice and leading students to develop their learning.

Lajolo (1996) uses the term school material rather loosely. To the author, this material is any object used in school activities for learning purposes. With this definition, she considers textbooks one of the most relevant school resources since it influences learning, playing a paramount role in the school. Therefore, the researcher believes books, computers, notebooks, maps, magazines, videos, chalk, and blackboards, among many other possibilities, are all school materials.

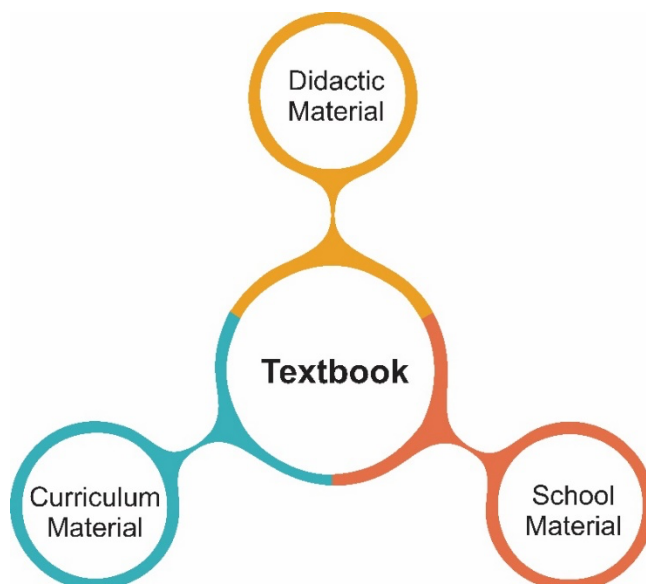
From Zabala’s (1998) perspective, the curriculum materials configure and, most of the time, dictate teachers’ activities. To the author, curriculum materials, or materials of curriculum development, are the instruments that provide teachers with references and criteria for decision-making on planning, execution, and evaluation. In other words, they can be understood as all the means that help teachers to respond to concrete problems that arise at any time during the planning, execution, or evaluation of learning. Within the scope of mathematics education, Remillard (2005) uses the expression curriculum materials, which Januário (2017, p. 15) treats as those

[...] made available to teachers to mediate/promote learning situations, whether textbooks, handouts, materials produced by non-governmental organisations, digital materials, or support notebooks prepared by education departments for curriculum implementation and development in their respective educational networks.

Therefore, despite being distinct, the three expressions mentioned above are close to each other and help us find a position for the textbook. We can consider, then, the textbook as being didactic material, from Nérici’s (196?) lens, school material, through Lajolo’s (1996) eyes, and curriculum material, according to Zabala (1998), Remillard (2005), and Januário (2017). Figure 1 illustrates the idea of the textbook as a polysemous term that can

be defined as didactic material, school material, and curriculum material.

Figure 1: Facets of the textbook



Source: Amaral et al. (2022, p. 27).

However, our intention is not to problematize which of these expressions is more pertinent (even if possible) or to try to point to a single use. Instead, we intend to clarify our understanding of textbooks, proposing reflections on this material, regardless of in which ‘category’ it may be inserted.

Characterizing the textbook

According to Lajolo (1996, p. 4), books “are central to the production, circulation, and appropriation of knowledge, especially the knowledge for which the school is responsible”. From Munakata’s (2016) perspective, although TBs can be found in different places, they are typical of the school, so their essence is evident in and through it. In this sense, TBs are “explicit components of school culture” (Munakata, 2016, p. 123) because they conduct school knowledge, i.e., they are vehicles for consolidating and socializing such knowledge. This reflection brings us to the idea of TBs as inherent to the educational context; therefore, the occasions in which they are not used are rare.

Some researchers fail to discuss, even briefly, their understandings and/or definitions of what a TB is. Others, however, elaborate their definitions to express their insights about such a resource. There is no single, universally accepted definition of a TB, even because it is practically impossible to define it in a simplified way due to the functions it can assume and its multiple facets (Bittencourt, 2004). Taking this scenario into account, we present some views that bring to light elements that contribute to the debate and understanding of the role of this material.

Molina (1987, p. 17) states that the TB is “a work written (or organised, as so often happens) with the specific purpose of being used in a specific didactic situation, which makes it, in general, anomalous in other situations”. From the author’s perspective, every book can serve didactic purposes. However, not every book should be considered as such.

In line with Molina (1987), Lajolo (1996, p. 4) argues that the TB is probably elaborated, edited, sold, and bought with a focus on its use in school and that it “needs to be used systematically in the teaching-learning of a particular object of human knowledge, usually already consolidated as a school subject”. Finally, Lajolo (1996) adds that this material is intended for students’ collective learning, guiding the teacher.

In his considerations on TBs, Bittencourt (1993) states that it has a complex nature, which justifies the interest in developing research on such an object. To the author, the TB

[...] it is a commodity, a product of the world of publishing that obeys the evolution of manufacturing and commercialization techniques belonging to the interests of the market, but it is also a depositary of different educational contents, privileged support for recovering knowledge and techniques considered fundamental by a society at a given time. In addition, it is a pedagogical instrument (...) considered as a vehicle for carrying a system of values, an ideology, a culture (Bittencourt, 1993, p. 3).

Meksenas (1995, p. 133) adds other elements for understanding the TB, defining it “as a commodity that composes mass culture and conveys knowledge aimed at school teaching situations, whether at the level of reproduction or social questioning”. Thus, this way of viewing the book considers it as a “potential object of the contradictions of capitalism” since, at the same time that it conveys the dominant ideology, it does not prevent

it from being criticized and problematized by users.

Santos and Carneiro (2006, p. 206) considered that books should “serve teaching and learning processes in basic education” and observe the characteristics of being produced by publishers. In this direction, Martins, Sales, and Souza (2009, p. 13) assume the textbook as “a printed material, structured, intended for the learning process or academic education, being used systematically”.

Other conceptions and characterizations of textbooks can be found in the literature. It is not the purpose of this text to conduct an exhaustive survey of such understanding but to express our perception based on reflecting on previously disseminated ideas. We understand the textbook (TB)

as a printed or digital material designed and edited to contribute to the educational processes of teaching and learning, composed of knowledge of a particular curriculum component or area of knowledge proposed from the official curricular prescriptions in force at the time of its elaboration. Such knowledge is displayed in the textbooks based on ideas and concepts and through activities that may enable students to apply topics previously discussed (or not) and get involved in inquiry experiences that go beyond what is offered in the material. Moreover, textbook production is not neutral. On the contrary, it has an ideology that supports it and is a means of disseminating the values and beliefs of a given culture located in a specific historical period (Amaral et al., 2022, p. 30).

This way of seeing the TB brings to light aspects beyond concerns with teaching situations, aiming at learning specific content. Given the above, we emphasize that TBs promote ideological conceptions and worldviews of those who elaborate and/or edit them, requiring a careful look when selecting and using them. We must also pay attention to the specific knowledge contemplated, not reinforcing prejudiced, sexist, racist, and LGBTphobic beliefs, among other issues that are part of discussion agendas in society in general and should be pointed out in curriculum guidelines and public policies aimed at education.

In classroom practice, teachers think about what they teach and how they teach content based on TBs but not exclusively on them. Thinking about this intimate relationship between the teacher and the TB implies thinking about the public policies of the textbook

and those linked to teacher education. After all, “the choice and use of it [the textbook] need to be based on the competence of the teachers who, together with the students, will make it (the book) a learning instrument” (Lajolo, 1996, p. 4).

The textbook has a specific destination, being directed to the student and the teacher. With a view to favouring learning, the components of the book, such as language, symbology and images, must be

depending on the collective situation in the classroom so that specific contents, values, and attitudes can be learned from it, and it is expected that learning does not only take place by reading the information that the book provides but also by carrying out the activities it suggests (Lajolo, 1996, p. 5).

Thus, we understand that the work school develops must be based on the types of teaching and learning that it assumes. Besides, it must also have cultural, social, political, historical, and economic issues. Indeed, the learning that students will construct is linked to the conceptions assumed by the school and those conveyed by the TB, and these are not detached from their historical, political, and social context.

For these reasons, adaptations from what the TB proposes are possible and even necessary in the search for actual connections between the teacher and the textbook, the teacher and the student, and the textbook and the school through the exercise of autonomy of the teacher in the planning and implementation of their school practices, aiming to consider the context of the community and, in particular, their students’ reality.

These ideas carry the view that the teacher is not only a receiver and multiplier of the proposals presented in the TBs but that their attributions go far beyond that. In this way, we believe the teacher, as a subject that mediates the process, must make of the materials elements that promote teaching and learning critically from a political perspective, aiming at students’ integral formation, contemplating their various –social, political, economic, and cultural– facets.

Different roles of textbook

In the literature, it is possible to find authors (Carvalho; Lima, 2010, Choppin, 2004; Gérard; Roegiers, 1998) who allude to some roles played by TBs in the educational sphere. These assignments may vary depending on cultural, social, political, and economic factors, the school subject it addresses, and the level at which it is used.

In a continental country such as Brazil, with a national programme regulating TB evaluation, we noticed the first important role recognized by this resource: the curriculum reference. TBs are prepared according to the curriculum documents such as the National Curricular Parameters (PCN) or, more recently, the National Common Curricular Base (BNCC). Thus, they express the curriculum the State prescribes (Sacristán, 2000). As a reference, TBs show us the skills to achieve, the contents to be taught, and the competencies to be developed. We understand, therefore, that the TB makes explicit the formal knowledge operated at a specific time and corroborates the implementation and development of the curriculum determined in the country. We consider it pertinent. However, we should reflect on it.

The curriculum is never just a neutral body of knowledge that somehow appears in a nation's texts and classrooms. It is always part of a selective tradition, the result of someone's selection, of some group's view of what legitimate knowledge is. It is the product of tensions, conflicts and cultural, political, and economic concessions that organise and disorganise a people (Apple, 2011, p. 59, emphasis added).

These considerations lead us to the second role assigned to the textbook, the ideological-cultural, which, according to Choppin (2004), is the oldest function assigned to this resource. Matić (2019), Munakata (2016), and Thomaz (2013), among others, point out that the TB disseminates traditions and ideological, religious, political, cultural, gender, and ethnic values that guarantee the supposedly 'true' discourse, which is generally the discourse of the ruling class. In a way, these discourses exert control over the population, demarcating teaching boundaries. Therefore, the TB dictates the culture to be taught (Apple, 1992).

Lopes (2000) emphasizes that TB, as a cultural product produced by humans, is full of interests and intentions, being a complex and partial resource.

When this instructional resource reaches the teacher's hands, it is loaded with intentionality and concepts that go unnoticed in the eyes of those who use them: the teacher and the student. In the textbook, as in every educational project, there is an underlying ideology that reflects the thinking of sectors of society, regardless of whether they have been made by educational technicians from the government sphere, scientific associations, publishers, or authors, each one sustaining interests that affect in the pedagogical action (Lopes, 2000, p. 13).

Given the above, we perceive how reflecting on textbook content is essential. There must be room for "raising awareness about the cultural pluralities that compose social reality" and for questioning and problematising the "silencing about specific cultures, mainly those considered minorities" (Silva; Carvalho, 2004, p. 1).

TBs are also a source of theoretical-methodological knowledge. In these materials, students find already established and socially recognized knowledge and can consolidate, expand, deepen, and integrate it (Carvalho; Lima, 2010). Likewise, teachers can learn from the book, given that initial education does not always cover everything teachers need to know for their profession.

Besides content, TBs can help disseminate teaching methodologies/trends, contributing to their teaching education. Mathematics TBs, for example, sometimes use historical approaches to discuss a particular concept; they are based on solving problems to introduce a topic and/or suggest using digital technologies to discuss some notion or content. It is often from TBs that the teacher has contact with these trends and can increase the list of methodologies in their school routine. In this direction, Lajolo (1996, p. 4) states that textbooks condition "teaching strategies, thus decisively marking what is taught and how what is taught is taught".

Therefore, we can understand TBs as a potential source for teacher learning (Remillard, 2005) regardless of whether that was the creators' purpose (Davis; Krajcik, 2005). To enhance the teacher's learning, the TB must have some features such as those pointed out by Davis and Krajcik (2005), based on Ball and Cohen (1996): helping teachers to anticipate and interpret what students may think or do in response to the proposed activities; support teachers' content learning, referring both to facts and concepts within some content and disciplinary practices within the area; contribute to teachers' work in

considering ways to relate study units throughout the year; and make visible the underlying pedagogical conceptions of the textbook developers.

These ideas add knowledge to teachers' repertoire and can guide their actions, favour adaptation in using TBs, allowing greater flexibility in connecting what is in the book and what the teacher will put into practice.

The fourth function of the TB is scientific divulgation. TBs are rich sources of scientific facts and can be a student's first contact with the world of science. Regarding this functionality of the TB, we have that

Scientific dissemination is understood, in a generic way, as a diffusion activity, directed outside its original context, of scientific knowledge produced and circulating within a community of restricted limits, mobilising different resources, techniques, and processes for disseminating scientific and technological information to the general public (Zamboni, 2001, p. 46).

According to Carvalho and Cunha (2017, p. 1454), TBs, based on scientific texts, "can reduce the distance between scientific knowledge and students, giving way to a dialogue that approaches people's daily lives". Being more accessible and presenting less elaborate language, infographics and other visual elements can contribute to this scientific dissemination. These elements make this dissemination attractive, a relevant factor for "quality scientific dissemination", as stated by Sacristán (2013, p. 21).

In this context, the scientific dissemination texts present in TBs can contribute to the teaching practice, allowing the teacher to motivate students and explore the contents and information conveyed there, raising their interest to continue seeking more information. We envisage this role of the TB as a possible starting point so that, through the work carried out by the school as a whole and by the teacher in the classroom, students involved in research, problematization, dialogue, and exchange of experiences move from a process of naive curiosity to epistemological curiosity (Freire, 1996), which has a methodical rigour that is fundamental in the construction of new knowledge.

The construction or production of knowledge about the object implies the exercise of curiosity, its critical capacity to "take a distance" from the

object, to observe it, to delimit it, to split it, to “surround” the object or make its methodical approximation, its ability to compare, to ask (Freire, 1996, p. 33, emphasis added).

Based on the scientific dissemination texts conveyed in the TB, we consider that teachers can encourage the exercise of curiosity as a challenge for constructing knowledge and refining and deepening contents and concepts addressed in the classroom. Exercising this curiosity is relevant, not least because the government distributes TBs in different economic and cultural regions. Thus, students require similar conditions to access scientific information (Souza; Rocha, 2017). In this way, the TB can enable this access. However, it is the teacher’s attribution to observe that some terms presented in scientific dissemination texts may not be familiar to students.

Finally, the last attribution to be listed is the instrumental. According to Choppin (2004, p. 553), the TB proposes activities that “aim to facilitate the memorisation of knowledge, favour the acquisition of disciplinary or transversal competencies, the appropriation of skills, etc.” Thus, the textbook can encourage investigations so that students need to go beyond what is included in their texts, seeking new sources of information. This type of task can even contribute to students’ autonomy, especially regarding decision-making on how to organize their answers.

We understand that this attribution is related to the curricular reference insofar as the activities are closely related to the content presented in the TB. These situations are an opportunity to promote student learning when they put into practice what they already know about the subject, observing their knowledge and perceiving their advances.

In his studies on the emergence of school subjects, Chervel (1990) points out that the success of a given school subject is related to the quality of the proposed exercises and their respective correction. Therefore, we understand that the teacher elaborated, structured, and/or selected the activities to provoke some students’ demands: interpreting what was requested, choosing strategies to work with the content and recording their answers. In this way, students’ learning process is modelled by activities that condition the conclusions they can draw from a given content or situation (Sacristán, 2000).

In this regard, we believe that the authors should propose different types of activities,

proposing tasks of “various difficulties”, seeking to meet the diversity of students, both in their prior knowledge and personal learning strategies. In this sense, the TB must include from procedural exercises to tasks that require interrelationships between different topics, whether from the same area of knowledge or not, promoting students’ experience in research processes. The contact with this variety can contribute to students’ learning and evolution.

Given what we have presented, we emphasize that the use of TBs in the classroom mobilizes their different roles, either as curriculum reference or ideological-cultural element or as a source of theoretical-methodological knowledge and scientific divulgation or even assuming their instrumental role. Thus, we conjecture that properly articulating the referred attributions associated with the textbook will favour the teacher’s practice and contribute to students’ learning, directing the school towards a work that reaches its central objectives.

The teacher and the textbook

Once our insights on the textbook have been exposed, it is worth emphasizing teachers’ value concerning this material. Supported by the PNLD, Brazilian public schools can select the desired collections among those approved in the notice. For such, the involved must be clear about the supporting criteria. For example, teachers may be interested in a textbook that proposes the frequent use of technologies or a more traditional⁴ textbook, one with a variety of activities or one that features more interdisciplinary connections, among many other aspects that they consider essential⁵.

Having the book in hand, how it will be used can make all the difference in teaching and learning. According to Lajolo (1996, p. 8), “The worst book can be good in the hands of a good teacher while the best book fails in a bad teacher’s classroom”. Teachers need, at all times, to reflect and question the material in their hands. As Freire points out,

[...] the important, the indispensable thing is to be critical. Criticism creates

⁴ We refer to a traditional book as one that follows the sequence of concept-example-exercise.

⁵ Choosing the textbook is a complex process that involves collective reflection and analysis by the school on several points. Furthermore, this selection reverberates in the students’ critical training process (Perovano, 2022).

the necessary intellectual discipline, asking questions about what is read, what is written, the book, the text. We must not submit to the text, not be submissive before the text. The point is to fight with the text, despite loving it, isn't it? Fight the text (Freire; Shor, 1987, p. 22).

We expect teachers to question the content of a textbook and know how to make the necessary changes and modifications when using it. For example, the sequence of chapters available in the TB is idealized by the author, but the teacher determines the order in which it will be put into practice in the classroom. We do not expect that there will be an incentive for all activities to be carried out without distinction. On the contrary, teachers must be independent and exercise their autonomy to indicate the paths to be followed and even be aware of when TBs are not essential. The teacher gives life to the ideas in a TB, and for that, they interpret, select, or modify those presented by the authors.

These different forms of appropriation of TBs are addressed by Brown (2002) as reproduction, adaptation, and improvisation. At reproduction, the teacher chooses to follow the textbook as designed. The teacher virtually does not modify it. At adaptation, the material must fit the context in which it is inserted, taking into account students' reality and of the school in which it is being used.

In turn, improvisation concerns the fact that the teacher assumes greater responsibility and creativity in elaborating teaching strategies and proposals, not depending (or depending to a very low degree) on textbooks in their teaching practice. The diverse forms of appropriation of textbooks proposed by Brown (2002) are suitable for works in all areas of knowledge. It is in this context that we insert the mathematics TBs, from which we agree with the idea that

Even if the mathematics textbook has sufficient qualities to qualify it for classroom work, the teacher is the one who knows and interacts with his/her students on a daily basis. Thus, the textbook should be a means and not an end in itself. Based on the student's knowledge and the social context in which the school is inserted, the teacher modifies, complements, and inserts new problems, activities and exercises to those in the textbook. It is as if he/she were rewriting the textbook with his students (Dante, 1996, p. 89).

We do not intend to judge such uses because, as Brown (2009) highlights, none of

those actions (reproduction, adaptation, and improvisation) is better or worse than the other, and these are choices that do not characterize the quality of teaching but show how TBs contribute to teachers' practice. We believe that these forms of appropriation can have a place in teaching practice at different times, and it is up to the teacher to recognize how to proceed and what posture to assume in each situation.

Final considerations

Teachers and textbooks are important agents in the educational context. Faced with this reality and considering several possible themes for investigations whose object of study is TBs, our research seeks to contribute to reflections on this resource, addressing its characteristics and interlocutions with the curriculum, among other relevant topics.

In Brazilian public institutions, the public educational policy stands out. We refer to the PNLD, which manages stages ranging from guidelines for publishers regarding their preparation, passing through the pedagogical evaluation of a technical commission and teachers' choice of the textbook, to purchase and distribution to schools.

We highlight some of the assignments of the textbook in order to highlight the plurality of roles that this material can assume. Nevertheless, we do not intend to exhaust the reflections about the didactic materials. Instead, this theoretical essay we share here aims to foster dialogue in mathematics education to intertwine perspectives not limited to research but that provide opportunities for discussions in formative spaces (initial and continuing education) that involve teaching experiences with this material.

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