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Curriculum materials as a discursive genre in mathematics education

Materiais curriculares como gênero discursivo em educação matemática

Los materiales curriculares como género discursivo en educación matemática

Les matériels curriculaires comme genre discursif en didactique des mathématiques

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Abstract

This article expresses a study guided by the objective of characterizing and discussing Mathematics curriculum materials from the perspective of discursive genre. Considering them a secondary genre of discourse, we argue that the style of communication of the contents and concepts in these materials, including Teacher's Manuals, influences the responsiveness of teachers and students in the teaching and learning processes. Based on theoretical reflections, we propose a structure of enunciative-discursive analysis that allows us to examine how the contents and concepts are presented and addressed in the learning situations incorporated into the materials, as well as to identify to which students and teachers they are addressed. In the discussion, we use excerpts from two research studies to illustrate what is addressed and to whom the pedagogical approaches are addressed, as well as to highlight the responsiveness incorporated into the materials.

Keywords: Teaching Approaches, Mathematical enunciations, Addressing, Responsiveness.

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Resumen

El artículo expresa un estudio guiado por el objetivo de caracterizar y discutir materiales curriculares de Matemática desde la perspectiva del género discursivo. Considerándolos un género secundario de discurso, argumentamos que el estilo de comunicación de los contenidos y conceptos en estos materiales, incluidos los Manuales del Profesor, influye en la capacidad de respuesta de los docentes y estudiantes en los procesos de enseñanza y de aprendizaje. A partir de reflexiones teóricas, proponemos una estructura de análisis enunciativo-discursivo que permita examinar cómo se presentan y abordan los contenidos y conceptos en las situaciones de aprendizaje incorporadas en los materiales, así como identificar a qué estudiantes y docentes van dirigidos. En la discusión, utilizamos extractos de dos estudios para ilustrar a qué y a quién se dirigen los enfoques pedagógicos, así como para resaltar la capacidad de responsividad incorporada en los materiales.

Palabras clave: Enfoques de Enseñanza, Enunciados Matemáticos, Direccionamiento, Responsividad.

Résumé

L'article exprime une étude guidée par l'objectif de caractériser et de discuter des matériels curriculaires de Mathématiques du point de vue du genre discursif. Considérant qu'il s'agit d'un genre de discours secondaire, nous soutenons que le style de communication des contenus et des concepts de ces supports, y compris les Manuels de Professeur, influence la réactivité des professeurs et des étudiants dans les processus d'enseignement et d'apprentissage. Sur la base de réflexions théoriques, nous proposons une structure d'analyse énonciative-discursive qui nous permet d'examiner comment les contenus et les concepts sont présentés et abordés dans les situations d'apprentissage incorporées dans les matériels, ainsi que d'identifier à quels étudiants et professeurs ils s'adressent. Dans la discussion, nous utilisons des extraits de deux études pour illustrer à quoi s'adressent les approches pédagogiques et à qui, ainsi que pour souligner la réactivité incorporée dans les supports.

Mots-clés : Approches Pédagogiques, Énoncés Mathématiques, Adressage, Réactivité

Resumo

O artigo expressa um estudo teórico-metodológico com ilustrações empíricas orientado pelo objetivo de caracterizar e discutir materiais curriculares de Matemática a partir da perspectiva de gênero discursivo. Considerando-os um gênero secundário do discurso, argumentamos que

o estilo de comunicação dos conteúdos e conceitos nesses materiais, incluindo os Manuais do Professor, influenciam a responsividade de professores e estudantes nos processos de ensino e de aprendizagem. A partir de reflexões teóricas, propomos uma estrutura de análise enunciativa-discursiva que permite examinar como os conteúdos e conceitos são apresentados e abordados nas situações de aprendizagem incorporadas aos materiais, bem como identificar para quais estudantes e professores eles são endereçados. Na discussão, recorremos a recortes de duas pesquisas para ilustrar o que é endereçado e a quem se endereça as abordagens pedagógicas, bem como para evidenciar a responsividade incorporada aos materiais.

Palavras-chave: Abordagens de Ensino, Enunciações Matemáticas, Endereçamento. Responsividade.

Curriculum materials as a discursive genre in mathematics education[4]

Curriculum materials, including Teacher's Manuals, are central to the Mathematics education process in Brazil. Such materials not only organize and communicate mathematical content, they are also incorporated into curriculum development through pedagogical practices and the training of teachers and students. In the context of Basic Education, the *Programa Nacional do Livro e do Material Didático* [National Book and Teaching Material Program — PNLD] stands out as a strategic public policy that evaluates, selects, and distributes books to schools in public and religious systems that choose to participate in the Program. Its relevance is highlighted by Amaral et al. (2022) and Perovano (2022), who highlight the role of this material in the implementation of the Mathematics curriculum.

From the research landscape that we have been developing for over ten years, including those that we have supervised, we have seen the textbook as a curriculum material, conceiving it as a dimension of the curriculum. This perspective considers the level at which, according to Sacristán (2013), the educational project and the curriculum text are transformed and manifested in concrete practices. Also according to the author, the curriculum is configured as an element that articulates and organizes the knowledge to be studied, crossing educational projects while impacting pedagogical practices. In this context, it shapes/traces/designs the teaching experiences of teachers and the learning experiences of students, establishing the contents that should make up this educational trajectory, constructing the contents that integrate this trajectory, especially its structuring, representing what the student needs to learn and overcome, in addition to indicating the sequence in which this learning should occur (Sacristán, 2013).

Research conducted by Ongstad (2006) and Remillard and Kim (2020) highlights that curriculum materials incorporate a particular way of communicating the content to be taught, the concepts to be formed, as well as resources and guidelines that serve as mediators of the teaching practices designed in these materials. Unlike other works and support materials, the main purpose of curriculum materials is not only to present the content in an accessible way, but also to create conditions for its materialization in the classroom context. In addition, these materials assign roles to teachers and students, promoting interaction and engagement in a differentiated way. Communication in these materials fits the specific purpose of structuring and organizing knowledge.

[4] This article is an expansion of the content originally published in the *IX International Seminar on Research in Mathematics Education*, held in 2024, deepening the discussion of curriculum materials as a discursive genre in Mathematics Education.

Based on Ongstad's (2006) reflections, it is understood that this communicational perspective encompasses a dynamic and simultaneous interaction between the different agents involved in the educational process — curriculum materials, teachers, and students. This interaction manifests itself in the way the text is prepared, the contents are presented, and the concepts are addressed. In addition, this perspective considers the construction of meaning based on the articulation between what is familiar and what is new, reflected in the *theme* and *rheme* system, in the statements, and between the different textual genres. This communicative dynamic, in turn, enables the formation of a discursive understanding, essential to promote learning in Mathematics.

When we think about curriculum materials, especially those in Mathematics, we observe that they play a unique role. As discussed by Ongstad (2006) and Remillard and Kim (2020), they can be seen as a discursive genre that, in addition to presenting content, induces teaching approaches, foresees interactions, and implements curriculum innovations. With this, the objective is to characterize and discuss Mathematics curriculum materials from the perspective of discursive genre. The study presented in this article is part of research that we have been developing and guiding in the *Research Group on Curriculum and Mathematics Education* (GPCEEM) and in the *Research Group on Mathematics Education, Curriculum, and Education* (GPEMCE), respectively, linked to the Postgraduate Programs in Education at the State University of Montes Claros and the State University of Southwest Bahia, in addition to studies that we have been carrying out at the Federal University of Bahia, in Brazil.

From this perspective, such materials are configured as mediation tools that communicate, stimulate interaction, induce attitudes, transmit knowledge and ideologies, incorporate principles, enable the construction of meaning and significance, and promote the educational process. In other words, they are central elements in the teaching and learning process, and the Teacher's Manual, in particular, is a key piece in this process (Lima, Januario & Perovano, 2024; Souza, Januario & Perovano, 2024). They provide resources that help teachers expand their knowledge, develop new knowledge, and appropriate pedagogical and curriculum innovations. These materials contribute significantly to teaching practice, offering support that enriches teachers' professional repertoire and strengthens the quality of teaching.

Curriculum material as a discursive genre

In different social situations, and especially in the educational environment, the process of exchanging and transmitting information, ideas, knowledge, and even feelings, values, and attitudes occurs through language. In educational processes, language connects teachers,

students, and curriculum materials by using specific characteristics and notation systems to organize and transmit knowledge and enable interactions. Language is linked to the various social activities that permeate the teaching and learning context, increasing its relevance and impact. It is expressed in different ways, depending on the purposes, the context, and the group of people communicating, based on various discursive genres.

Bakhtin (2016) considers discourse as a language action, being dialogically oriented and a social phenomenon. This author considers that the various fields of human activity involve the use of language. The use of this language, in turn, occurs in the form of statements, which can be oral or written, pronounced by the members of a certain field of human activity to which they refer. The "relatively stable types of statements" elaborated by a certain field of language use are called, by Bakhtin (2016), as "speech genres" (p. 262). The author uses the term *viskázivanie* to refer to *statement* and *enunciation*, without distinguishing the terms, which "means the act of enunciating, expressing, transmitting thoughts, feelings, etc. in words" (Bakhtin, 2016, p. 11, translator's notes) both for the act of producing oral and written discourse. Despite understanding that each particular statement is individual, Bakhtin (2016) understands that there are relatively stable types of these statements, which is why it is possible to consider them as speech genres.

Bakhtin (2011, 2016) understands that there is a diversity and heterogeneity of discursive genres, precisely because human activity is multifaceted and has possibilities that favor this diversity. However, he presents a distinction between two types of genres, namely, primary and secondary genres of discourse. The first refers to basic and practical communication that occurs in everyday life and that varies according to the social and cultural context, such as advice, email, message from an application, spreadsheet, cooking recipe. Secondary genres are used in institutional and academic contexts, being formal and structured, which "arise in the conditions of a more complex and relatively highly developed and organized cultural coexistence (predominantly written) — fictional, scientific, sociopolitical, etc." (Bakhtin, 2016, p. 15), such as scientific articles, novels, political discourses, pedagogical discourses, and advertising genres. This author highlights that in the formation process, secondary (complex) discursive genres "incorporate and rework various primary genres, which were formed under the conditions of immediate discursive communication" (Bakhtin, 2016, p. 15).

We understand curriculum materials, including Teacher's Manuals, as a secondary genre. These materials are multifaceted; they not only organize and communicate mathematical content, they act as tools to support teaching practices and professional teacher knowledge, in

addition to supporting the students' learning process. In addition, they incorporate elements of social, economic and political interests, characterizing themselves as a tool that seeks to meet the expectations of evaluation and recommendation by professionals who work in schools, in the case of the PNLD, as well as to convey values and beliefs specific to a given culture, always in tune with the historical context in which it is inserted.

In the context of public policies, curriculum materials are prepared with the purpose of enabling the implementation of curriculum reforms. They usually translate, in the form of learning situations, content approach, task proposition, what is proposed, with a more general approach, in the curriculum guidelines and prescriptions (Rodrigues Junior, 2025).

By proposing learning situations, these materials concretize prescriptions about the knowledge that students must build throughout the school year, while also directing teaching work by indicating approaches, procedures, presentation of content and types of tasks.

In curriculum materials, unlike other types of materials that circulate in educational spaces, there is a pedagogical discourse (what is meant) that is embodied in educational statements (what is said) expressed in texts (how it is said) that approach Mathematics based on sign words (with what is said), which refer to content and concepts. Bakhtin (2011, 2016) highlights theme, style, composition, purpose, schematic structure, content, discursive and linguistic resources as characteristics of the discursive genre.

As a field of human activity that uses language, in curriculum materials, particularly in Mathematics, the use of language is effective based on its statements — in approaches, procedures, tasks, learning situations. These statements reflect the specific conditions and purposes of this field; they reflect the conditions and purposes of the Mathematics teaching and learning processes to which they are proposed. In this sense, we consider these materials to be secondary discursive genres, and as such, they incorporate and rework, in the process of their formation, other discursive genres: definitions, theorems, graphs, tables, figures, signs, diagrams, tasks, texts, algorithms, demonstrations, among others (genres) that communicate conceptual, procedural and attitudinal content. These are the typical forms of statements present in this discursive genre to which we are assigning the Mathematics curriculum materials, in particular, the Teacher's Manual.

Depending on the style of a learning situation, it can incorporate cooking recipes, game rules, notes, news articles, excerpts from a play, adding elements that integrate the curriculum and contextualize knowledge, and can provide pedagogical practices that connect school content and real contexts.

In addition to including these discursive genres mentioned and incorporated in the

Student's Book, Teacher's Manuals for curriculum materials include ways of communicating guidelines to teachers for developing what is being proposed to students. This includes guidelines on class organization; procedures for teaching what is being proposed on the student's page — when the Teacher's Manual reproduces the pages of the Student's Book —; a list of materials for reference; details of teaching strategies for approaching and treating the content; alerts to important aspects that require attention during the implementation of tasks; in addition to including statements on evaluation and implementation of various instruments for monitoring student learning.

As a discursive genre, Teacher's Manuals for curriculum materials require a specific type of reading on the part of the teacher. Unlike literary works, such as novels, or other instruction manuals, their reading needs to be guided by a pedagogical intentionality, directed towards the possibilities of action that the statements, included in the discursive genre, can engender. This intention aims not only to create meaningful learning opportunities for students, but also to continuously develop the teacher, especially in the context of teaching with Mathematics.

Similar to what Remillard and Kim (2020) discuss about the change that occurred in the Teacher's Manuals of curriculum materials distributed in schools in the United States in the 1990s, the research we have been guiding and developing — for example, Perovano (2022), Machado (2023), Souza (2024) and Soares (2024) — has shown that, since the 2010s, in Brazil, the Manuals have undergone significant changes in their structure. These changes have highlighted not only the role of the material itself, but also the role played by teachers and students in the teaching and learning processes.

In line with what Remillard and Kim (2020) consider in relation to the Manuals in the context of the United States, we can state that, in Brazil, “the Mathematics teacher’s guide became a messenger of Mathematics content and related pedagogical practices” (p. 70), which has contributed to the relationship that teachers have when using these materials and, thus, expanding their mathematical knowledge for teaching. By this, it refers not only to specific content knowledge, but also to knowledge related to teaching.

According to research by Machado (2023), Souza (2024) and Soares (2024), the Mathematics Teacher's Manuals of curriculum materials are designed to mobilize the capacity for pedagogical design. This is done through texts that guide the approach and treatment of content in the classroom. As a discursive genre, these Manuals dialogue directly with teachers, focusing on teaching practices that aim at the formation of concepts by students. This dialogue is established through statements that can assign roles to the teacher and students. From this

perspective, the Teacher's Manuals call for ways of acting, speaking and teaching, constituting a space for the production of meanings about what it means to teach Mathematics and who the teacher is who teaches.

This context highlights the importance of familiarity with the Manuals, which helps in the interpretation of what is communicated through text, enunciation, discourse and sign words. Furthermore, the relationship between teachers and these materials influences how they interpret pedagogical guidelines, evaluate teaching proposals, and choose and implement learning situations in their teaching practices.

An enunciative-discursive structure to analyze Mathematics curriculum materials

As a discursive genre, curriculum materials are instruments that enable communicative actions between teachers and students in the teaching context. Through the statements that compose them, these materials have the potential to influence the people who use them, impacting their conceptions about Mathematics, its teaching and learning, as well as the ways in which knowledge is constructed. At the same time, these materials do not act in a unidirectional manner: when they are read, interpreted and mobilized in practice, they are constantly reworked, resignified and adapted to local realities, with changes in the way learning situations are presented, in the didactic sequence and in the approaches proposed in the tasks.

Considering that all communication is dynamic and takes place in dialogue with others, it is possible to affirm, with Bakhtin (2016, p. 25), that it is always “full of response”. In this sense, the relationship between teachers, students and curriculum materials presupposes responsive attitudes. Responsiveness, understood as an active and engaged response to the statement, refers to people's involvement in discursive interaction, allowing them to transform, complement or reconstruct the meanings expressed in the material. It is a complex dialogical act that generates transformation, complementation, recreation of what was read or heard, or produced as meaning and significance by the reader or listener to whom the speech or statement was addressed (Bakhtin, 2011, 2016).

If we assume that the main function of curriculum material — whether in Mathematics or other areas — is to provide conditions for learning to be constructed by students, it is necessary to recognize that the way in which content and concepts are communicated can directly influence people's ways of responding. In the case of Teacher's Manuals, this influence extends to teaching, since the writing style and the way in which teachers are addressed impact their pedagogical decisions and, consequently, the learning opportunities offered to students.

The analytical framework we propose below (Table 1), inspired by Remillard and Kim

(2020), seeks to highlight how content and concepts are organized, treated, and proposed in curriculum materials. This framework allows/provides the opportunity to analyze not only what is taught, but also how and to whom it is taught, that is, what types of students and teachers are assumed and called upon by the texts, and how the source of mathematical knowledge is constructed in these materials.

Table 1.

Structure for analyzing curriculum material as a discursive genre (Own elaboration)

Dimension	Indicator	Descriptor
1 Content approach	1.1 Conceptual	The tasks proposed to students enable the formation of concepts or the exploration of concepts inherent to the content (knowledge).
	1.2 Procedural	The tasks proposed to students involve the mobilization of known strategies, algorithms or resolution techniques or present procedures that may be new to students (doing).
	1.3 Attitudinal	The tasks proposed to students require the manifestation or development of attitudes involving values, norms and principles (living together and being).
2 Levels of cognitive demands[5]	2.1 Memorization	They involve the reproduction of previously learned facts, rules, formulas, or definitions or the confirmation of memorized facts, rules, formulas, or definitions. They cannot be solved using procedures because a procedure does not exist or because the time interval in which the task is being completed is too short to use a procedure. They are unambiguous. Such tasks involve the exact reproduction of previously seen material/content, and what is to be reproduced is stated clearly and directly. They have no connection to the concepts or meanings underlying the facts, rules, formulas, or definitions being learned or reproduced.
	2.2 Procedures without connections	They are algorithmic; the use of the procedure is specifically required or is evident from previous instructions, experience, or task placement. They require limited cognitive demand for successful completion. There is little ambiguity about what needs to be done and how to do it. They have no connection to the concepts or meanings underlying the procedure being used. They are focused on producing correct answers rather than developing mathematical understanding. They require no explanations or explanations that focus solely on describing the procedure that was used.
	2.3 Procedures with connections	They focus students' attention on using procedures to develop deeper levels of understanding of mathematical concepts and

[5] The wording of the descriptors is identical to what Stein and Smith (1998) present in their article.

		ideas. They explicitly or implicitly suggest paths to follow that are broad, general procedures that have close connections to underlying conceptual ideas, as opposed to narrow algorithms that are opaque to the underlying concepts. They are often represented in a variety of ways, such as visual diagrams, manipulatives, symbols, and problem situations. Making connections between multiple representations helps develop meaning. They require some degree of cognitive effort. Although general procedures can be followed, they cannot be followed without reflection/reasoning. Students need to engage with conceptual ideas that underlie the procedures for successfully completing the task and that develop understanding.
	2.4 Doing mathematics	They require complex, non-algorithmic thinking — a predictable, well-rehearsed approach or path is not explicitly suggested by the task, task instructions, or a worked example. They require students to explore and understand the nature of mathematical concepts, processes, or relationships. They require self-monitoring or self-regulation of their own cognitive processes. They require students to access relevant knowledge and experience and make appropriate use of it in working through the task. They require students to analyze the task and actively examine its constraints that may limit possible solution strategies and solutions. They require considerable cognitive effort and may involve some level of anxiety for the student due to the predictable nature of the solution process required.
3 Organization of students	3.1 Collective	The entire class participates in the lesson, communicating their resolutions (procedures) and results, or expressing their understanding and doubts; in class, students help each other.
	3.2 Double	Students in pairs, with one of them able to demonstrate greater learning and help the pair with difficulty.
	3.3 Group	Groups in which students communicate their resolutions (procedures) and results; express their understanding and doubts; and assist each other.
	3.4 Individual	Individually, students participate in the class; at the teacher's discretion, some communicate their resolutions (procedures) and results, and express their understanding and doubts.
4 Role of students	4.1 Respondent	Students express or confirm their answers with those presented by the teacher; in some cases, students copy the solutions from the board or from the material provided; students are not asked to verbalize (explain/describe) how they proceeded with their solutions.
	4.2 Descriptor	Students list some or all of the procedures adopted in the resolutions.
	4.3 Argumentator	Students explain the procedures adopted and verbalize their

		reasoning; they report the relationships, properties, and characteristics they identified; and they communicate their strategies and understandings.
5 Role of the teacher	5.1 Transmitter	The teacher shares their knowledge as they lead the class—presenting procedures, explaining ideas/concepts, and providing answers.
	5.2 Reproducer	The teacher leads the class by reiterating information, procedures, and answers contained in the referenced support material.
	5.3 Facilitator	The teacher engages students in correction and discussion, asking questions or requesting explanations, and facilitates student interaction with each other and with the activity and underlying content. However, they also intervene and present procedures, explaining ideas/concepts, and providing answers.
	5.4 Coordinator	The teacher encourages active student participation by communicating their solutions and explaining their strategies and understandings. They create opportunities for students to establish relationships, perceive properties/characteristics, and make discoveries. They allow students to analyze and discuss other students' strategies; and they provide specific interventions.
6 Source of knowledge	6.1 Teacher	The teacher imparts knowledge, determines the activity, and validates correctness; the teacher acts as transmitter or facilitator.
	6.2 Students	Students generate knowledge; they reason, arrive at discoveries, and establish connections with the planned content; students act as describers or arguers.
	6.3 Curriculum Materials	Knowledge, task-solving strategies, and correct answers are determined by curriculum development support materials.

The analytical framework presented here differs from previous frameworks by integrating dimensions of content approach (Zabala, 1998), levels of cognitive demand (Stein & Smith, 1998), organizational forms, and teacher and student roles (Remillard & Kim, 2020), based on a Bakhtinian perspective on discourse. While Zabala (1998) and Stein and Smith (1998) emphasize the didactic nature of tasks, and Remillard and Kim (2020) explore curriculum design, the study presented in this article proposes an enunciative-discursive articulation that allows us to understand the material as a genre, highlighting the elements of saying, what is said, and what is addressed. The originality of the proposal lies in its emphasis on responsiveness as an analytical category derived from Bakhtin (2011, 2016), linking the

roles assumed by people, students and teachers, and by the material in pedagogical practice to the ways in which they are enunciatively constructed in the didactic text.

From Bakhtin's (2016) perspective, every utterance is produced in response to another — a real or presumed interlocutor — who actively participates in the communication. Thus, the reader or listener is a constituent part of the utterance, as the author (or enunciator) organizes their speech or writing in response to (addressed to) a reader/listener (enunciatee). In this sense, we understand that teachers and students are agents involved in the discourse expressed in curriculum materials, which are developed based on expectations of responsiveness. These agents are expected to exhibit attitudes such as acceptance, identification, attribution of meaning and significance, and engagement with the proposed learning situations, using them as references for planning and experiencing teaching and learning episodes.

Responsiveness, as a central concept, can manifest itself in different ways. Menegassi (2008) points out that it can be *immediate*, when there is a precise, determined, and provoked manifestation; it does not correspond to the notion of chronology; *silent* or *passive*, when an action is developed without any other option to do it, which may demonstrate a lack of understanding of the statement or demonstrate a delayed understanding of that statement; *delayed* or *mute*, when there is a time to move away from the real situation in order to develop a response (or reaction), which may be short or long.

The analytical framework (Table 1) was designed specifically to facilitate the analysis of the addressing present in the learning situations proposed by curriculum materials, as well as to identify the degrees and forms of responsiveness invoked by such texts. In doing so, we seek to understand how they can influence the practices of teaching and learning mathematics, based on what was intended to be stated, what was stated, how it was stated, with what it was stated, and to whom it was stated. It is important to emphasize that this framework reflects our choice to consider the dimensions and indicators incorporated within it.

We emphasize that this analytical framework reflects a methodological approach constructed from the categories we consider central to our objective. However, we recognize that it can be expanded or adjusted depending on the nature of the research and the analytical focuses adopted. For example, Lima (2017) proposes a framework for analyzing mathematics curriculum materials; In the research by Machado (2023) and Soares (2024), the concept of curriculum integration was considered to analyze High School materials, such as Integrative Projects; Souza (2024) considered the problem classes of the additive field to analyze a collection of material from the Elementary School; Durães (2025) analyzed the pedagogical approaches related to the indicative of games in five collections of curriculum materials; and

Rocha (2025) analyzed such approaches regarding the levels of cognitive demands of Algebra tasks in two collections of materials from the Middle School. In this sense, it is clear that the presented structure can be adjusted to integrate customized versions seeking to understand educational practices in Mathematics.

From the addressed to the addressed: excerpts from two studies

As a discursive genre, all mathematics curriculum materials are addressed to someone else, to whom their statements are textualized — to a recipient (enunciatee), which can be teachers or students, and which are anticipated or idealized by the authors (enunciators), as suggested by Bakhtin (2011, 2016).

To illustrate what curriculum materials are addressed to and to whom they are addressed, we will present and discuss fragments of two studies conducted in the Postgraduate Program in Education at the State University of Montes Claros, within the *Research Group on Mathematics Education Curriculum* (GPCEEM). Both studies, guided by a qualitative approach, adopted the method of documentary analysis in Teacher's Manuals of works approved by the PNLD for Middle School.

Durães's (2025) research focused on the use of games in five collections of materials, including guidelines for teachers. These collections were selected based on the 2024 PNLD selection report, which identified the collections adopted by public schools in the city of Coração de Jesus (Minas Gerais, Brazil), where the author works as a teacher. In addition to document analysis, Durães also conducted focus group interviews with three teachers to understand how these materials were interpreted and evaluated in teaching practice.

For his dissertation, Rocha (2025) analyzed two collections focusing on Algebra tasks and their teaching guidelines, investigating the levels of cognitive demands and pedagogical approaches incorporated into the materials.

The data collection and production period took place in 2023 and 2024, based on the digital versions of the collections. The empirical data discussed in this article are, therefore, illustrative excerpts extracted from both dissertations, mobilized here to demonstrate the applicability of the enunciative-discursive analytical framework we propose.

In their analyses, Durães (2025) considered dimensions 1, 3, 4, 5, and 6, while Rocha (2025) considered dimensions 2 to 6 of Table 1. It is important to emphasize that neither analysis was produced based on discursive genre, and this perspective is considered in the discussion that follows.

What is addressed

The analysis of the 138 game indicators in the five collections investigated by Durães (2025) reveals 9 enunciative mentions associated with *attitudes*, 29 related to *concepts*, and 44 focused on *procedures*. These mentions were identified in terms and expressions used in the presentation of the games, in the description of the rules, and in the corresponding tasks. The results indicate that the educational project addressed to students predominantly emphasizes procedures, followed by a project based on conceptual formation.

Zabala's (1998) considerations converge on teaching practices that enable students to form concepts, understand and use procedures, and develop attitudes. Similarly, the literature on games, as discussed by Smole, Diniz, and Cândido (2007), highlights that these pedagogical resources favor mathematical learning by promoting the development of various skills, encompassing concepts, attitudes, and procedures.

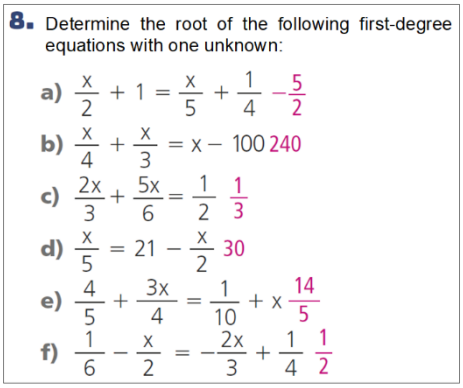
The analysis of 664 Algebra tasks in the two collections studied by Rocha (2025) indicates 237 *memorization* tasks, 105 *procedures without connections*, 168 *procedures with connections*, and 154 *doing mathematic* tasks. These data reveal that the training project addressed to students is based on low cognitive demand, prioritizing memorization tasks, which diverges from the discussions made by Stein and Smith (1998) who understand the need for a balance in the variety of tasks offered to students regarding cognitive demands and possibilities of different reasoning to promote mathematical learning.

Bakhtin (2016) argues that every utterance presupposes responsiveness, the addressee of the discourse. Enunciations about games and levels of cognitive demand incorporate styles, techniques, calculation and resolution strategies, algorithms, and schemes for organizing information; and the use of procedures and concepts to solve a given task. A mathematics curriculum — in the sense of learning situations — based on procedures and the use of what is already known is what is addressed as a teaching project to students who use the curriculum materials from the collections analyzed as resources to support the learning process.

In the case of game cues, responsiveness refers to actions to be performed by students in response to the stimuli of the utterances, such as drawing the game diagram, reporting, preparing a report, moving pieces, and performing steps in the game. In the case of levels of cognitive demands in Algebra tasks, responsiveness is related to directed actions, which do not cause doubts among students in terms of what to do, as can be seen in Figures 1 and 2.

In both tasks, as in the others classified in this category, the statements address a procedure without connection. As a responsive response, although students may express different attitudes, the procedure to be used is evident, based on previously given instructions

regarding how to solve a first-degree equation in the task in Figure 1 and how to divide two monomials in the task in Figure 2.


8. Determine the root of the following first-degree equations with one unknown:

a) $\frac{x}{2} + 1 = \frac{x}{5} + \frac{1}{4} - \frac{5}{2}$

b) $\frac{x}{4} + \frac{x}{3} = x - 100$ 240

c) $\frac{2x}{3} + \frac{5x}{6} = \frac{1}{2}$ $\frac{1}{3}$

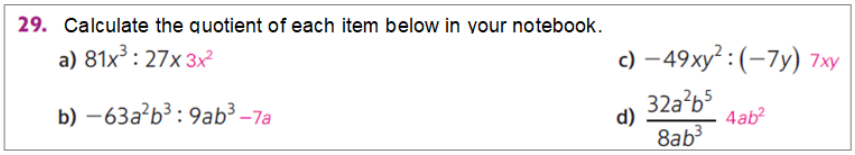
d) $\frac{x}{5} = 21 - \frac{x}{2}$ 30

e) $\frac{4}{5} + \frac{3x}{4} = \frac{1}{10} + x$ $\frac{14}{5}$

f) $\frac{1}{6} - \frac{x}{2} = -\frac{2x}{3} + \frac{1}{4}$ $\frac{1}{2}$

Figure 1.

Example of a disconnected procedure task in A Conquista da Matemática, 7th grad (Giovanni Jr., 2022, p. 155)


29. Calculate the quotient of each item below in your notebook.

a) $81x^3 : 27x$ $3x^2$

b) $-63a^2b^3 : 9ab^3$ $-7a$

c) $-49xy^2 : (-7y)$ $7xy$

d) $\frac{32a^2b^5}{8ab^3}$ $4ab^2$

Figure 2.

Example of a disconnected procedure task in Matemática e Realidade, 8th grad (Iezzi, Dolce & Machado, 2022, p. 109)

When analyzing communication in mathematics, particularly that incorporated into curriculum materials, Ongstad (2006) mentions familiar and new elements in the process of signification. In both tasks, *"Find the root [...]?"* and *"Calculate the quotient [...]"*, the semantic meaning is evident for the mathematics student, expressing something familiar — that is, a theme — that operates the same procedure for calculating the value and determining the root.

Learning, argues Ongstad (2006), involves the interaction between the new (rheme) and the known (theme). For a student familiar with mathematical genres, the statement expresses the theme. According to Bakhtin's theoretical formulations (2011, 2016), *determining the root* and *calculating the quotient* communicate a specific action expected from the enunciator: that is, performing an operational procedure to determine the value that answers the question. For

example, the words *justify* and *show*, as units of a statement or as the statement itself, convey different responsive positions. This is because each word carries within itself a horizon of meanings that is shaped by the concrete conditions of its enunciation, which go beyond semantic content and involve discursive intentions.

The analysis of the curriculum material collections highlights the addressing of conceptual, attitudinal, and procedural content in the game instructions; and tasks that demand varying degrees of reasoning related to Algebra. However, it reveals an imbalance in teaching approaches, with *procedural* and *memorization* being prioritized. These are the approaches most frequently addressed in the instructions, which encourage limited student participation in actions that require little reasoning and strengthen the mobilization of strategies and concepts already known to students. While such approaches may imply playful lessons with participatory students, they can result in processes that reinforce what is already known and discourage the discovery (construction) of new things.

To whom is it addressed?

As discussed in Lima (2017), Perovano (2022), and Lima, Januario, and Perovano (2024), curriculum materials are developed to support both teachers and students in the teaching and learning processes. As discourse genres, these materials communicate the knowledge outlined in the curriculum, concretizing it in learning situations. In the specific case of the Teacher's Manual, there are statements that guide the behaviors to be adopted by teachers when conducting teaching practices, as well as those that should be encouraged among students.

According to Remillard and Kim (2020), curriculum materials pre-establish roles for teachers and students, which guide their actions in mathematics classes. In the sense of discourse genre, this *prior establishment* or anticipation of the expected roles for teachers and students are the subsequent links in discursive communication. This means that, when curriculum materials propose their statements, when constructing their utterances, whether through approaches to content, procedures, task propositions, or in the guidance provided to the teacher, they do so considering the role of each agent to whom these statements are addressed — in this case, teachers and students. For Bakhtin (2016, p. 62), the “statement is constructed taking into account the responsive attitudes for which it is, in essence, created. The role of

others, for whom the statement is constructed, is exceptionally important".

Teachers and students, as agents of curriculum development, mediated by curriculum materials, are the recipients of the statements, from whom active, responsive comprehension is expected. Responsiveness is fostered by statements, whether in teaching guidelines or in assignments. What is taught and what is learned is a consequence of those who teach and those who learn; naturally, the people involved are viewed by those who develop the statements based on what is addressed to them. This perspective can be observed by referring to Bakhtin (2016, p. 62), who emphasizes that "an essential (constitutive) feature of the statement is the possibility of its being *directed* to someone, of its being *addressed*".

Students can assume the roles of *respondent, describer*, or *arguer*; teachers, however, assume the roles of *transmitter, reproducer, facilitator*, or *coordinator*. These are the roles we assume as recipients of the discourse embodied (conveyed) in the collections of mathematics curriculum materials analyzed by Durães (2025) and Rocha (2025).

The analysis of the game cues highlights the addresses for the responding students, which are passive postures that express actions determined by the material (tasks) or by the teachers, such as expressing or confirming the expected answer; responding directly to what is asked; and following instructions. This participation, as respondents, can reflect what is addressed — transmitting information, reproducing information, performing procedures, and mobilizing what has been memorized. The task in Figure 3 exemplifies what we analyzed.

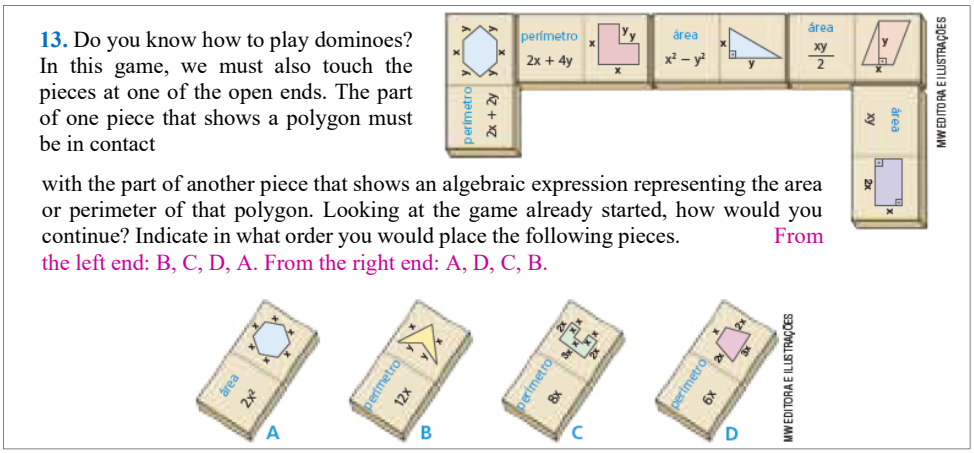


Figure 3.

Domino game sign in A Conquista Matemática, 8th grad (Giovanni Jr., 2022, p. 135)

In the task statement, when asking students to observe the game and indicate in what order they would place the pieces, the word *indicate* expresses the action of observing the polygonal representations and their respective measurements, performing the calculation, and locating the correct domino piece. This refers to objective instruction that has the students as respondents, as recipients of the statement. This role differs from the stance addressed to teachers as facilitators.

By assuming this role, or when addressed to assume this role, teachers engage students in discussion, encourage participation with questions, and stimulate interaction, although they present procedures and answers when deemed necessary.

Regarding the analysis of Algebra tasks, 513 tasks addressed to student respondents were identified. In the instructions to the teacher, expressions and words such as *the student will answer the questions; identify; determine*; and *verify* are common, reinforcing the responsive behaviors expected of students. This role established for the student is reminiscent of the teacher's role as reproducer, with 279 corresponding tasks.

As reproducers, teachers guide the lesson; they reiterate information, procedures, and answers contained in the curriculum material, which is generally the source of knowledge. In the following excerpt, it is possible to observe that the verb *resalte* (highlight), as a unit of enunciation, expresses what needs to be communicated in the first statement and the procedure associated with the second statement.

> In activities 1 through 3, emphasize that the number mentioned in the statement should be understood as something generalized — that is, any number, whose value doesn't initially matter. In activity 4, it's important to emphasize that different quantities, in this case, tables with different capacities, should be represented by different letters. (Matemática e Realidade, 7th grad — Iezzi, Dolce & Machado, 2022, p. 184).

As demonstrated in the previous section, when analyzing the statements in the curriculum materials, we identified different discourse recipients. The analysis reveals a recurrence of students as respondents and teachers as facilitators and reproducers. By assuming the role of respondents with more passive postures due to what is addressed (procedures and

memorization), we can infer an imbalance in the theme-rheme system discussed by Ongstad (2006), since what is already known may stand out in the students' responses. For the author, “the balancing and changes of these elements occur as the text (the statement) develops for both the speaker and the interpreter” (Ongstad, 2006, p. 259). Here, we position teachers as speakers and students as interpreters, although we do not disregard the fact that teachers are also interpreters of the statements incorporated into the curriculum materials. As speakers, whether assuming the roles of facilitators or reproducers, we infer that the theme-rheme system needs to be relatively balanced, since the given and the new are part of learning situations and are present in teachers' utterances.

However, the reproductive role tends to restrict teachers' autonomy. When developing the curriculum and implementing classroom tasks, a communicative process mediated by utterances occurs due to the unity between the person of the utterance (teachers) and the discursive genre to which they belong, in which they communicate with other people involved (and participants) in the communicative act (students) (Bakhtin, 2016). As reproducers, teachers repeat, confirm, validate, legitimize, certify, and materialize utterances and their addresses, maintaining the alternation of the person of the utterance and the person involved between curriculum materials and students. Undoubtedly, this process affects not only teaching approaches but also the ways in which learning is constituted.

Other words

The reflection presented in this article derives from studies and research we have developed on Mathematics curriculum materials. The approach adopted in this work was guided by the enunciative-discursive perspective, understanding materials as a discourse genre. This perspective allows us to understand the formative processes in Mathematics, for both teachers and students, mediated by curriculum materials, as complex and multifaceted, marked by the presence of the other as the person to whom the discourse, or enunciation, is addressed.

From the enunciations imbued in the curriculum materials, teachers and students are implicated by what is addressed by the speaker (or the writer, the author). This requires considering that formative experiences result not only from the content addressed (what is addressed), but also from the responsive component that acts on the enunciators. Thus, teachers

and students are foreshadowed in the discursive genre; teachers are viewed in the Teacher's Manuals, and students in the Student's Book. Every statement has an author — curriculum materials are made up of statements — and a recipient. All curriculum materials are written by someone (the author of the discourse) for a specific teacher and student profile (the people to whom the discourse is addressed). In a dialogical conception of discourse, teachers and students assume roles that are decisive in the development of curriculum materials and in the choices made to implement the curriculum through the learning situations they present. Teachers and students are not passive; on the contrary, they occupy responsive positions with the materials and the statements they embody: they identify/disregard them, agree/disagree, accept/reject them, make changes, question them, adopt them as a source of knowledge, use them as a support resource, and guide their practices.

The way teachers and students are viewed in the materials can be identified in the styles of addressing. The analysis and discussion demonstrate the prediction of different teaching approaches for content and levels of cognitive demand, as well as the prediction of distinct roles for teachers and students. However, the predominance of procedural content, memorization tasks, the role of respondent for students, and the framing of teachers as reproducers and facilitators also highlights the curriculum perspective that emerges, both in the form of learning situations and learning experiences.

This analysis and discussion are not intended to lead to generalizations, as they refer to a cross-section of two studies. Although the reflections may contribute and present elements for problematizing the effects of the processes of teaching and learning Mathematics based on the addressing of the statements incorporated into curriculum materials, the findings presented result from the theoretical and methodological choices we made.

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