

Official Curricula and Modeled Curricula of Mathematics in the Literacy Cycle: an Analysis of the Coherence of Objectives and Activities Present in Lesson Plans

Currículos Oficiais e Currículos Moldados de Matemática no Ciclo de Alfabetização: uma Análise da Coerência dos Objetivos e Atividades Presentes nos Planos de Aula

Currículos Oficiales y Currículos Moldeados de Matemáticas en el Ciclo de Alfabetización: un Análisis de la Coherencia de los Objetivos y Actividades Presentes en los Planes de Clase

Curriculum Officiel et Curriculum Mathématique Moulé dans le Cycle d'Alphabétisation: une Analyse de la Cohérence des Objectifs et Activités Présents dans les Plans de Cours

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Abstract

This paper analyzes the coherence between objectives and activities proposed in Mathematics lesson plans for the literacy cycle. Planning is recognized as an important moment of pedagogical work and as being able to model the curriculum that will be developed with students. This study is qualitative in origin, using a documentary research design. To achieve this aim, lesson plans, of the remote teaching period, of teachers of the literacy cycle were analyzed in a descriptive way in terms of the announced objectives and the proposed activities. It was possible to conclude, in this study, that a large part of the analyzed lesson plans did not present coherence between what they claim to develop in the objectives, such as the skills and how they operationalized these intentions in the activities. In conclusion, it is possible to say that curricula may lose their strength if planning is only focused on the execution of the activities.

Keywords: Mathematics, Literacy Cycle, Planning.

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Resumo

Este artigo analisa a coerência entre objetivos e atividades propostas em planos de aula de Matemática para o Ciclo de Alfabetização. Reconhece-se o planejamento como um importante momento do trabalho pedagógico e como sendo capaz de moldar o currículo que será desenvolvido com os estudantes. O estudo é de origem qualitativa valendo-se do delineamento da pesquisa documental. Para tal, planos de aula, do período de ensino remoto, de professoras do Ciclo de Alfabetização foram analisados de modo descritivo no que tange aos objetivos anunciados e às atividades propostas. Foi possível concluir, neste estudo, que grande parte dos planos analisados não apresentava uma coerência entre o que diziam desenvolver nos objetivos, tal qual habilidades e como operacionalizam essas intenções nas atividades. Concluiu-se, portanto, que os currículos podem perder sua força, quando o planejamento se centra exclusivamente na execução de atividades.

Palavras-chave: Matemática, Ciclo de Alfabetização, Planejamento.

Resumen

Este artículo analiza la coherencia entre objetivos y actividades propuestas en planes de clase de Matemáticas para el Ciclo de Alfabetización. Se reconoce la planificación como un momento importante del trabajo pedagógico y como ser capaz de dar forma al plan de estudios que se desarrollará con los estudiantes. El estudio es de origen cualitativo valiéndose del delineamiento de la investigación documental. Para ello, los planes de clase, del período de enseñanza a distancia, de profesoras del Ciclo de Alfabetización fueron analizados de modo descriptivo en cuanto a los objetivos anunciados y las actividades propuestas. Fue posible concluir, en este estudio, que gran parte de los planes analizados no presentaba una coherencia entre lo que decían desarrollar en los objetivos, tal cual habilidades y cómo operacionalizan esas intenciones en las actividades. Se concluyó, por lo tanto, que los currículos pueden perder su fuerza, cuando la planificación se centra exclusivamente en la ejecución de actividades.

Palabras clave: Matemáticas, Ciclo de Alfabetización, Planificación.

Résumé

Cet article examine la cohérence entre les objectifs et les activités proposées dans les plans de cours de mathématiques pour le cycle d'alphabétisation. La planification est reconnue comme un moment important du travail pédagogique et comme étant capable de façonner le programme qui sera développé avec les étudiants. L'étude est d'origine qualitative et s'appuie sur la conception de la recherche documentaire. À cette fin, les plans de cours de la période

d'enseignement à distance des enseignantes du cycle d'alphabétisation ont été analysés de manière descriptive en ce qui concerne les objectifs annoncés et les activités proposées. Cette étude a permis de conclure qu'une grande partie des plans analysés ne présentaient pas de cohérence entre ce qu'ils prétendaient développer dans les objectifs, tels que les compétences et comment ils opéraient ces intentions dans les activités. Il a donc été conclu que les programmes peuvent perdre de leur force lorsque la planification se concentre exclusivement sur l'exécution d'activités.

Mots-clés : Mathématiques, Cycle d'alphabétisation, Planification.

Official Curricula and Modeled Curricula of Mathematics in the Literacy Cycle: an Analysis of the Coherence of Objectives and Activities Present in Lesson Plans.

It is permissible to assume that, since Comenius' *Didactics Magna* (1649), teaching and learning have revolved around this immense and controversial domain called Didactics. It encompasses different moments and elements of the educational processes, articulating and sustaining itself in multiple Sciences: Psychology, Sociology, Philosophy, and other fields of the so-called Human Sciences. It is through Didactics and its approaches that the most varied educational methods and resources are produced, mirroring the different epistemological aspects that underlie education.

Although various methods, techniques, and resources, there is a relative consensus that the core of Didactics relies on planning, practice, and evaluation. The ways of conceiving and executing these elements are profuse. Hence, such words seem polysemous. Nevertheless, these elements are bound to the curriculum and the path to be taken in the teaching processes.

Recently, Brazil has changed its curriculum policy under the aegis of what has been called the *Base Nacional Comum Curricular* (BNCC). It is a guiding document for different federated entities to structure Basic Education curricula for public and private institutions. However, the term 'Base' does not seem appropriate given the structure of the BNCC text (Freitas, Silva & Leite, 2018). According to the BNCC, there are many skills to be followed and fulfilled by teachers and students. The implementation of curricula is dependable in the 'Base'. The BNCC is seen as the cap of maximum objectives to be achieved, so this base-ceiling dichotomy is due, in part, to the participation of Basic Education teachers and managers, with its construction centered on technocratic work.

Entendemos que há um processo verticalizado e de centralização, pois a elaboração do documento e os direcionamentos para sua implementação desconsideram os docentes, os estudantes e as diversas realidades do contexto brasileiro. Neste mesmo viés, ainda sinalizamos que o processo não foi constituído a partir da necessidade e da peculiaridade da escola, mas de uma decorrência que deverá impactar a sala de aula (Fávero, Centenaro & Bukowski, 2021, p. 1685).³

Furthermore, the SARS-CoV-2 pandemic has put enormous pressure on educational systems since March 2020, given the health crisis. The possibility of working with communication and information technologies was highly predicted as a resource for remote

³ We understand that there is a vertical and centralized process, since the elaboration of the document and the guidelines for its implementation disregard the professors, the students, and the different realities of the Brazilian context. In this same bias, we still indicate that the process was not constituted by the need and the peculiarity of the school, but by the result that should impact the classroom (Fávero, Centenaro & Bukowski, 2021, p. 1685).

teaching. This new way of teaching, not based on face-to-face relationships or synchronous contact, required profound changes in Basic Education teaching know-how. The implementation of new curricula supported by the BNCC was consolidated in the pandemic context.

Such confluence of factors established the investigation of the internal coherence between objectives and activities in the Mathematics teaching plans of the early years of Elementary School during the CoViD-19 pandemic in the remote teaching modality.

According to Sacristán (2000), the curriculum has multiple dimensions. The official curriculum is not always used when shaped by teachers or implemented in the classroom. In these terms, it seems interesting to investigate the Mathematics objectives announced in the teaching plans to compare them with the activities that develop these proposals and that carry the intention of evolving skills. In other words, it is interesting to comprehend how the activities foreseen in the lesson plans of the Literacy Cycle teachers materialize the intentional objectives of the Mathematics curriculum. For this, a qualitative study used the outlines of documentary research. Teachers who teach Mathematics in the early years provided copies of their plans, which were treated as documents and had their elements submitted to a descriptive analysis to examine the relationships between objectives and intended activities. The Theories of Curriculum and Didactics (Sacristán, 2013, 2000; Silva, 1999; Perrenoud, 1999) highlight the relevance of working beyond content, highlighting the epistemological-political dimension of teaching practices. In this sense, the descriptive analysis verified how the objectives appear in the proposed activities and how the school curriculum materializes within the cultural process.

Educational planning and its importance for the teaching

This work started from a framework to examine, through the lesson plans, the objectives in line with the teacher's activity. The meaning and role of education brought by Zabala (1998) played a crucial part in the construction of the study. The author argues that no educational practice justifies itself without answering what to educate and what to teach. In this sense, the objectives constitute the end to be achieved and, at the same time, the starting point that sustains and establishes meaning for the pedagogical intervention. Veiga (2019) conceptualizes the importance of planning in education, bringing as a premise, already discussed by predecessor theorists, that planning is the basis for the affirmation and realization of the right to education. Henceforth, the relevance of identifying the coherence between the proposed objectives and the tasks presented in the lesson plans is the instrument that systematizes the concrete action of the teacher.

Menegolla and Sant'Anna (2014) argue that teaching is permeated with planning: it is for everything and everyone. The governing body works with planning, from direction, supervision, and guidance, as well as to the teachers and students. There are countless meetings and conversations under the pretext of planning. These plans range from the macro sphere, from the structuring of courses, the school, the Pedagogical Political Project, disciplines, content choices, activities, classes, and even assessments.

What is planning? According to Sacristán (2000), planning is a way of organizing conduct, regulating the practice in which the plan is expressed, and stabilizing the general guidelines through which actions take place, granting coherence. According to the author, 'the plan thus provides stability and coherence to the fluid course of events' (idem, p. 248). Planning, then, is part of everyday human actions: we plan what we are going to do for the week, for the day, how we can save money when we are going to travel, and so on. Thus, planning becomes action to achieve a goal or a desire.

O planejamento educacional torna-se necessário, tendo em vista as finalidades da educação; mesmo porque, é o instrumento básico para que todo o processo educacional desenvolva a sua ação, num todo unificado, integrando todos os recursos e direcionando toda a ação educativa. É o planejamento educacional que estabelece as finalidades da educação, a partir de uma filosofia de valores educacionais. Somente com a elaboração do planejamento se pode estabelecer o que se deve realizar para que essas finalidades possam ser atingidas, e ver como podemos pôr em ação todos os recursos e meios para atingir os objetivos a que se propõe a educação (Menegolla & Sant'Anna, 2014, p. 29-30).⁴

Whenever one plans, there is the identification of a need or a desire that arises from the reflection or sounding of the environment. Therefore, it is necessary to know the reality to achieve the desired objectives. Education and planning are part of the educational routine. Within the school, it has the function of establishing directions and paths, indicating goals and strategies, and purposes and objectives:

Tem que ser um planejamento suficientemente flexível para poder se adaptar às diferentes situações da aula, como também deve levar em conta as contribuições dos alunos desde o princípio. É importante que possam participar na tomada de decisões sobre o caráter das unidades didáticas e a forma de organizar as tarefas e seu desenvolvimento, a fim de que não apenas aumentem o nível de envolvimento no ritmo da classe em geral, como em seus próprios processos de aprendizagem, entendendo o

⁴ Educational planning becomes necessary regarding the purposes of education; it is the basic instrument for the entire educational process to develop its action, in a unified whole, integrating all resources and directing all educational action. It is educational planning that establishes the purposes of education, based on a philosophy of educational values. Only with the elaboration of planning that it be established what must be done so that these purposes can be achieved, and see how we can put into action all the resources and means to achieve the objectives that education proposes (Menegolla & Sant'Anna, 2014, p. 29-30).

porquê das tarefas propostas e responsabilizando-se pelo processo autônomo de construção de conhecimento (Zabala, 1998, p.94).⁵

That said, planning predicts actions and provides guidance. However, it is flexible and open to changes, whether due to student interest, some unpredictability, or even the assessment, which must be continuous and constant. Planning at school results in creating solutions, bringing alternatives to determine impasses, and, above all, designing an evolution so that the purposes are more easily achieved. The act of planning is about anticipating and preparing the resource conditions, such as necessary and possible circumstances to operationalize the objectives to provide better teaching and learning conditions (SILVA, 2017).

Veiga (2004) states that, within the teacher's work, teaching planning has the real meaning of bringing about an intentional pedagogical organization. Such an organization happens in a responsible and committed way with the formation of students. The act of planning becomes an essential pedagogical action for teaching and learning. The author states that only intentional and committed work based on pre-established curriculum content provides opportunities for the growth of the students' knowledge.

Thus, the objectives delimit and guide the educational activities. While ensuring a centralization of efforts towards what we want to teach and where we want to go, one can allow greater flexibility to the plan. Menegolla and Sant'Anna (2014) show that

A definição e a delimitação dos objetivos constituem o momento mais importante e crucial do ato de planejar. É o momento em que se vai estabelecer concreta e objetivamente o que se quer alcançar, onde se quer chegar e com que meios se pretende agir. [...] Os objetivos indicam as linhas, os caminhos e os meios para toda ação. [...] O objetivo é um propósito ou alvo que se pretende atingir. O objetivo é tudo aquilo que se quer alcançar através de uma ação clara e explícita (p. 74-75).⁶

Zabala points out that 'the purposes, general objectives or educational intentions, or whatever you want to call them, constitute the primordial starting point that determines, justifies, gives meaning to the pedagogical intervention' (1998, p. 21-22). Therefore, according

⁵ It must be flexible enough to be able to adapt to different classroom situations, as well as to take student contributions into account from the beginning. It is important that they can participate in making decisions about the character of the didactic units and the way of organizing the tasks and their development, so that they not only increase the level of involvement in the pace of the class in general, but also in their own learning processes. One has to understand the reason for the proposed tasks and taking responsibility for the autonomous process of knowledge construction (Zabala, 1998, p. 94).

⁶ The definition and delimitation of the objectives constitute the most crucial moment of the act of planning. It is the moment when you will concretely and objectively establish what you want to achieve, where you want to go, and with what means you intend to act. [...] The objectives indicate the lines, paths, and means for every action. [...] The objective is a purpose or target that one intends to achieve. The goal is everything you want to achieve through clear and explicit action (p. 74-75).

to Menegolla and Sant'Anna (2014), the objectives end up indicating and involving other elements that constitute a lesson plan, that is, they allude to content, procedures, resources, and evaluation processes.

The objectives are directly related to the evaluation process. If one knows what one wants, one can guarantee progress and establish performance standards. The lesson plan creates solutions, articulates strategies, and looks forward to the best way to resolve impasses is determined, projecting the evolution of a purpose. Although the planning and/or lesson plan has a practical dimension linked to the classroom, it is decisive to think of it as an element of the curriculum.

The curriculum

Sacristán (2013) reckons that the curriculum is the expression and proposal of organization of the parts of the contents that compose it. It is still an order that articulates actions so that it does not encourage fragmented learning with disordered actions:

O currículo desempenha uma função dupla – organizadora e ao mesmo tempo unificadora – do ensinar e do aprender por um lado, e, por outro, cria um paradoxo, devido ao fato de que nele se reforçam as fronteiras (e muralha) que delimitam seus componentes, como, por exemplo, a separação entre as matérias ou disciplinas que o compõem (Sacristán, 2013, p. 17).⁷

Knowledge-wise, the idea of selection and order of content is the choice of what contemplates teaching. Sacristán (2013) also points out that this unifying invention avoids arbitrariness in choosing what will be taught. It also molds, guides, and limits teaching autonomy so that

o currículo determina que conteúdos serão abordados e, ao estabelecer níveis e tipos de exigências para os graus sucessivos, ordena o tempo escolar, proporcionando os elementos daquilo que entenderemos como *desenvolvimento* escolar” (Sacristán, 2013, p. 18).⁸

Yet, according to Silva (1999), the idea that the curriculum deals only with an administrative organization is naive, as it has a forceful political approach that produces identities. In these terms, the curriculum is not simply the selection of contents: it is a set of

⁷ The curriculum performs a double function – organizing and at the same time unifying – of teaching and learning, on the one hand, and, on the other hand, it creates a paradox, since it reinforces the borders (and wall) that delimit its components, such as, for example, the separation between the subjects or disciplines that compose it (Sacristán, 2013, p. 17).

⁸ [...] the curriculum determines what content will be covered and, by establishing levels and types of requirements for the successive grades, organizes school time, providing the elements of what we will understand as school development” (Sacristán, 2013, p. 18).

knowledge that will form part of the educational project proposed by the school. The debate over values and beliefs allows one to understand the intentions foreseen in the documents as curricular policies. Its political production is loaded with intentionality and undergoes processes of recontextualization and translation, producing subjectivities and resistance to its implementation (Bernstein, 1990).

Sacristán (2000) identifies that the curriculum is always a multidimensional component: it is configured depending on the level at which it is discussed. For the author, the first level is the (1) Official Curriculum, produced by institutions and endorsed by specialists. From this official proposal, a second level is constituted, the (2) Presented Curriculum, in which there is preparation for presenting the official proposal to society and teachers. This Presented Curriculum is transformed by teachers and schools, which constitute a third level, the (3) Molded Curriculum, the curriculum thought by those who will be directly involved in the implementation and execution of the curricular proposal.

Sacristán (2000) highlights that this curriculum is not always materialized in the classrooms, which results in a 4) Practiced Curriculum, or fourth level, referring to what happens in classroom practice. Finally, there are also assessments within the school and external ones that function as regulatory elements to guide school processes, constituting a fifth level: (5) Assessed Curriculum. This study focuses, above all, on the levels of the Official Curriculum, which guide the objectives present in school plans, and on the Moulded Curriculum, intended for activities designed for students, without yet advancing or analyzing the level of the Practiced Curriculum.

Concerning the Official Curriculum, it is worth discussing what is in Brazil's official guidelines. The Base Nacional Comum Curricular (BNCC) is a normative document that defines the essential learning that students must develop throughout Basic Education (Brasil, 2018). Therefore, it is a set of actions that establish learning in all students must develop, limited by a period and with progressive advances.

In Basic Education, learning must be developed around the ten general competencies that embody the document (Brasil, 2018). The teaching defined by competencies intends to build meaning to everything the students learn so that they can use their knowledge in everyday situations. According to Freitas et al. (2019), in this logic, it is mandatory to involve students in the discoveries and reflections related to the proposed concepts and skills, stimulating verbal communication and bringing ideas, intuition, and proposals. Nonetheless, BNCC does not indicate how to do it and leaves it up to the teacher to understand and develop the skills based on the objectives and skills listed in the document.

According to Freitas et al (2018), skills end up not describing the action or behaviors expected of teachers and do not even bring options for approaches or methodologies. The curriculum in accordance with BNCC focuses on skill; by that, teachers keen on pedagogical practice concentrated on daily tasks and objectives are relatively helpless. Therefore, the BNCC thinks about the school without dialoguing with it or with its demands. The scientific discourse is praised while teachers wait for a curriculum that reflects their daily lives and the problems they face daily in their classrooms.

Methodological procedures

This study is a qualitative study (Gil, 2002) whose perspective of analysis focuses on data found in the Mathematics lesson plans prepared by teachers of the Literacy Cycle during the 2020/2021 school year in remote teaching modality. The documentary research (Lakatos & Marconi, 2010) allowed the framing of these lesson plans as primary sources without previous treatment. Data analysis centered on a descriptive technique in which the objectives of the lesson plans were analyzed in their intentions and the activities proposed in the possibilities of pedagogical work. Then, the study compared them to the initial objectives.

The requirement for data collection is that the plans were from public schools, referring to Mathematics teaching in the remote modality in 2020/2021. It was directed to the Literacy Cycle and provided by teachers who wished to spontaneously collaborate with the study. We collected plans with Mathematics objectives, so they did not respect a temporal sequence. Schools were invited in two bordering cities in the extreme south of Rio Grande do Sul with their own curricula for their networks. Seven collaborating teachers sent their plans, three from the 1st Grade, two from the 2nd Grade, and one from the 3rd Grade. The lesson plans were not necessarily sequential, nor was there a longitudinal representation of curriculum development. They had a weekly organizational structure and always contained objectives extracted from the official curriculum for different curricular components of the early years of Elementary School (Mathematics-wise). Next, there were activities provided to students and/or methods performed by the teacher. Part of these plans contained an evaluation element. Still, they were not analyzed.

There were 30 weeks of planning, which generated something around 150 days of activities. The plans received were primarily from the first two years: 17 from the 1st, 11 from the 2nd, and only two from the 3rd Grade. In the 30 plans, there were 134 objectives, 83 for the 1st, 45 for the 2nd, and 6 for the 3rd Grade, considering that some lesson plans were repeated,

because some belonged to different classes. These weeks were attached on digital platforms at the end of the previous week, but some teachers attached them on Mondays.

The idea that a lesson plan is a path and a project, adapted or explored in other ways in practical action, was considered as a limitation. Thus, such considerations are restricted to the intentions and announcements made, without being able to affirm the curriculum in action developed with the students. Even though there is awareness of the limitation of the study, it is remarkable to analyze the methodological developments that arise from the curricular objectives built under the influence of the BNCC.

Data analysis

In the first analysis, all the weekly plans that constituted the corpus contained Mathematics skills and objectives to be worked on. They did not differ much from the BNCC, with reference codes to local documents, which reinforces the idea that this policy froze the curricula and restricted the possibilities for the creation and invention of schools and teachers. The teachers replicated the *ipsis litteris* objectives of the official paper without intervention or rewriting.

Firstly, to approach the documents, the objectives were grouped according to the thematic units that guide the work of Mathematics within the Literacy Cycle. The municipal curricula, built from the BNCC, maintain this organizational structure. The following table – Table 1 – highlights the objectives of the lesson plans according to the Thematic Units. The distribution is by year, indicating the total objectives by Thematic Units and informing those whose proposed activities meet or do not meet the pattern. In other words, the objective totals are reported. Henceforth, a first consistency analysis is already presented. Given this, it shows whether the planned activities met the objectives and contents proposed in the plans.

Table 1.

Thematic Units (research data)

	1° Year			2° Year			3° Year		
	Total	Does attend	Does not attend	Total	Does attend	Does not attend	Total	Does attend	Does not attend
Numbers	53	27	26	35	5	30	5	3	2
Algebra	1	0	1	1	0	1	0	0	0
Geometry	0	0	0	0	0	0	1	0	1
Quantities e Measures	25	15	10	3	1	2	0	0	0
Probability and Statistics	4	0	4	6	3	3	0	0	0
Total	83	42	41	45	9	36	6	3	3

In this first grouping, the study found a significant difference between the Thematic Units concerning the frequency of the present objectives. There are numbers in almost all lesson plans. The privilege for this domain is reinforced by the BNCC and the official curricula, which allocate around 50% of their skills to the given field. Likewise, the study by Mandarino (2009) shows that this tendency is also related to what the teachers believe they teach with less complication. In addition, the author shows that the choice brings a dominant implicit conception that emphasizes the numerical field as the focus of Mathematics teaching.

The number of plans whose activities and objectives are misaligned is not exiguous. In the case of the 1st Grade, approximately half of the intended objectives do not converge with the proposed activities. Towards the Algebra Thematic Unit, none of the activities are coherent with the announced objectives. The examples presented, and analyzed descriptively, clarify how the process of analyzing the coherence between objectives and activities took place. At this point, the analysis of the expected skills is introduced to better understand this coherence in the lesson plans.

The first lesson plan is proposed for the 2nd Grade and belongs to the Thematic Unit of Probability and Statistics. It has the following objective: 'Explore single-column graphs, bar graphs, and double-entry tables and compare information in different situations, interpreting the data presented on near-reality problems'. When observing this objective, one expects that the activities present graphs and/or tables in the specified conditions with data close to the child's reality. The referred activity is presented below (Figure 1):



Figure 1.⁹

Image of a proposed activity for the 2nd Grade in the thematic unit of Probability and Statistics (research data)

There is the presentation of a column chart using good iconography, which includes children who have not yet consolidated the literacy process of the written language. Columns have their elements highlighted with inner lines, which makes it easier for students to understand the expressed quantities. The theme is the collection of clothes, and the components accounted for in the graph refer to clothing items. It is consistent with children's daily life. Then, the activity explores the quantities in operations based on the icons used in the graph, which, again, focuses on mathematical knowledge. In these terms, the proposed activity converges with the presented objectives and expresses coherence. This is an example of a lesson plan that Table 1 presents as meeting the expectations of the objectives.

⁹ "Observe the Graphic that shows the clothes collected by the children and answer the following questions. How many? How many shirts more than jumpsuits? How many t-shirts less than Jackets?"

On the other hand, one of the weekly plans for the 2nd Grade stands out. For the week, the teacher announced in her planning the development of four objectives (Figure 2).

Objetivo 1: Conhecer, identificar, comparar e ordenar a sequência numérica escrita e falada (até a ordem de centenas) reconhecendo pares e ímpares, ordem crescente e decrescente, antecessor e sucessor. ¹⁰
Objetivo 2: Observar e avaliar a quantidade de objetos de uma coleção atribuindo um valor aproximado e desenvolvendo procedimentos para diferenciar a avaliação realizada a partir de estimativas de um palpite sem reflexão, expressando e registrando a contagem desses objetos (até 1000 unidades) ¹¹
Objetivo 3: Conhecer e explorar as expressões dobro e triplo, relacionando com a multiplicação por 2 ou 3, elaborando formas pessoais de resolução das situações sem a utilização dos procedimentos convencionais, utilizando material concreto ¹²
Objetivo 4: Compor e decompor quantidades menores que 10 (fatos básicos) por meio de adições e subtrações desenvolvendo procedimentos para resolver pequenos problemas de contagem com apoio de material manipulável utilizando-os no cálculo mental ou escrito. ¹³

Figure 2.

Weekly objectives for 2nd Grade (research data)

Based on these objectives, it is possible to expect that the proposed activities will have a specific structure and content. The striking feature of Objective 1 is the work with numerical sequences, whether spoken or written, exploring even and odd numbers and other characteristics. The possibilities of offering education for this purpose are varied. Objective 2 works with collections presented or constructed by children to develop a numerical sense and the ability to estimate. Objective 3 marks the multiplication ideas with the introduction of double and triple expressions and indicates the use of concrete material. In Objective 4, the composition and decomposition of quantities are vital elements. The indicative of the basic facts allows the expectation with activities that involve calculation, noting that the objective also indicates the use of concrete material.

For the development of these objectives, the activities to be carried out throughout the week were (Figure 3):

¹⁰ Objective 1: To know, identify, compare, and order the written and spoken numerical sequence (up to the order of hundreds) while recognizing even and odd, ascending and descending order, predecessor, and successor.

¹¹ Objective 2: To observe and evaluate the number of objects in a collection, assigning an approximate value and developing procedures to differentiate the evaluation carried out from estimates of a guess without reflection, expressing and recording the count of these objects (up to 1000 units).

¹² Objective 3: To know and explore double and triple expressions, relating them to multiplication by 2 or 3, developing personal ways of resolving situations without using conventional procedures, using concrete material.

¹³ Objective 4: To compose and decompose quantities smaller than 10 (basic facts) through additions and subtractions, developing procedures to solve basic counting problems with the support of manipulable material using them in mental or written calculation.

RESOLVE OS CÁLCULOS ABAIXO:

$$\begin{array}{r} 67 \\ +12 \\ \hline \end{array} \quad \begin{array}{r} 23 \\ +22 \\ \hline \end{array} \quad \begin{array}{r} 87 \\ +12 \\ \hline \end{array} \quad \begin{array}{r} 21 \\ +19 \\ \hline \end{array} \quad \begin{array}{r} 56 \\ +12 \\ \hline \end{array}$$

$$\begin{array}{r} 28 \\ -11 \\ \hline \end{array} \quad \begin{array}{r} 37 \\ -21 \\ \hline \end{array} \quad \begin{array}{r} 67 \\ -25 \\ \hline \end{array} \quad \begin{array}{r} 78 \\ -03 \\ \hline \end{array} \quad \begin{array}{r} 37 \\ -17 \\ \hline \end{array}$$

LIGA O NÚMERO AO SEU NOME:

7	cinquenta e dois	32	quarenta e quatro
25	sete	80	cem
52	dezoito	44	trinta e dois
18	sessenta	78	oitenta
60	vinte e cinco	100	setenta e oito

ESCREVE POR EXTENSO OS NÚMEROS E DECOMPÕE CONFORME O MODELO:

D	U		
28	vinte e oito	2	8
87	_____		
13	_____		
37	_____		
8	_____		
35	_____		
79	_____		
53	_____		
10	_____		
26	_____		
92	_____		
04	_____		
59	_____		
63	_____		

COMPLETA A SEQUÊNCIA NUMÉRICA, OBEDECENDO AS REGRAS ABAIXO:

De 2 em 2

12	□	□	18	□	□	□	26	□	□	32
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De 3 em 3

15	□	21	□	□	□	33	□	□	□	45
----	---	----	---	---	---	----	---	---	---	----

De 4 em 4

10	□	□	□	□	30	□	□	□	□	50
----	---	---	---	---	----	---	---	---	---	----

De 5 em 5

0	□	□	□	20	□	□	35	□	45	□
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Figure 3.

2nd Grade activities for numbers (research data)

The first activity presents five addition and five subtraction beads. The calculations involve numerals with two digits. There is transport in only one of them. ‘Connect the number to its name’ explores the representation of numerals with numbers in writing in full. ‘Complete the numerical sequence, obeying the following rules’ brings four sequences with the indications of the constitution rules. ‘Write the numbers in full and decompose them according to the model’ returns to working on numerical writing in full and the relationship with the representation with numerals. It also explores the place value of the decimal numbering system through decomposition into tens and units.

¹⁴ “Solve the calculations below”, “Practice writing numbers and split them according to the model”, “Connect the number to its name”, and “Complete the numeric sequence, obeying the following rules”, respectively.

From the intended objectives and activities offered, it is possible to observe some coherence. The sequences are present, and the magnitude of the numerals is respected, but there is no indication of the use of concrete materials. As for Objective 1, observing the verbs that present the actions is fundamental: to know, to identify, to compare, and to order. Such verbs assume that the activity will provide a sequence regarding the properties. It is different from the ability to build or complete such sequences: now the focus is the exploration of properties and the activity directed towards the sequence's construction. Thus, the objective-activity relationship could be a little more aligned. Objective 2, regarding collections, is not contemplated in the development of activities. There are no collections or estimates. Objective 3, regarding double and triple and multiplication ideas, is also not developed in these activities. Objective 4, which deals with composition and decomposition and the basic facts of the additive field, is explored inefficiently, focusing on writing in full, which is not explicitly present in this objective. Also, one can question whether the calculations offered in the first activity can develop this skill. It is possible to suppose that there is a mistake in the last activity: the objective talks about composition and decomposition, but the project demands the identification of positional value. Hence, there is confusion between the idea of decomposition and the identification of place value.

It is possible to assume that two objectives are there only for protocol compliance. Menegolla and Sant'Anna (2014, p. 9) write that 'teachers come to realize that the planning requested of them is nothing more than bureaucratic requirements or defenses of certain pedagogical fads'. Thus, it is possible that the didactic-methodological resources for teaching are not exploited to their fullest potential, since there is no fully organized and intentional planning structure.

Another point remembered by Zabala (1998) is that working on the activity alone does not lead us to understand the whole, to comprehend the thought and use of it in everyday life, which makes the teaching of Mathematics outlying within a literacy construction.

Sabemos que os conteúdos, apesar de que seguidamente se apresentem em classe de modo separado, têm mais potencialidade de uso e de compreensão quanto mais relacionados estejam entre si. Muitos dos esforços dos professores estão voltados para oferecer modelos interpretativos que integrem conteúdos teoricamente isolados ou específicos para incrementar seu valor formativo. Assim, pois, o algoritmo soma, sem a compreensão do que significa somar e o conhecimento de cálculo mental, nunca possibilitará que os meninos e meninas sejam competentes na resolução de situações simples que impliquem somar; o conhecimento da toponímia de um país, sem a

interpretação de mapas, nunca lhes permitirá compreender problemas de caráter geográfico, etc. (Zabala, 1998, p. 139-140).¹⁵

In this sense, one must emphasize that in the sense of a weekly plan with four objectives, there would be the expectation of building a set of connected and related activities, developing, and expanding connections and understandings. In addition to meeting the objectives, there is the perspective that lesson plans present holistic and articulated approaches, which is not noticeable in the activities analyzed by the study.

Another predominant example to focus on is a weekly plan for the 1st year, as shown in Figure 4.

Objective 1: Compreender que o último número contado corresponde à quantidade total dos objetos e não ao nome do algarismo. ¹⁶
Objective 2: Explorar e utilizar estratégias próprias de composição e decomposição de números de até duas ordens, em situação diversas, com auxílio de material manipulável, contribuindo para compreensão de características do sistema de numeração decimal e o desenvolvimento de estratégias de cálculo. ¹⁷
Objective 3: Compreender os diferentes significados da adição e subtração: composição simples (juntar, separar); transformação simples (acrescentar, retirar, ganhar, perder), utilizando material manipulável. ¹⁸
Objective 4: Explorar e estabelecer relações aditivas entre números menores que 10, aplicando-as para resolver problemas em situações cotidianas. ¹⁹
Objective 5: Expressar resultados de contagens de forma verbal e simbólica, relacionando o algarismo à quantidade correspondente. ²⁰

Figure 4.

Weekly objectives for the 1st Grade in the Thematic Unit of Numbers (research data)

These objectives produce expectations that the activities and actions developed will be related to the introductory skills of the number field and the introduction of addition and subtraction operations. The first objective turns to the ability to differentiate order quantity, a

¹⁵ We know that the contents, although often presented separately in class, have more potential for use and understanding the more related they are to each other. Many of the professors' efforts aimed at offering interpretive models that integrate theoretically isolated or specific contents to increase their formative value. Thus, the sum algorithm, without understanding what it means to add and knowledge of mental calculation, will never allow boys and girls to be competent in solving simple situations that involve adding up; knowledge of the toponymy of a country, without the interpretation of maps, will never allow them to understand problems of a geographical nature, etc. (Zabala, 1998, p. 139-140)

¹⁶ To understand that the last number counted corresponds to the total number of objects and not to the name of the digit.

¹⁷ To explore and use proper strategies for the composition and decomposition of numbers of up to two orders, in different situations, with the aid of manipulable material, contributing to the understanding of characteristics of the decimal numbering system and the development of calculation strategies.

¹⁸ To understand the different meanings of addition and subtraction: simple composition (to join, to separate); simple transformation (to add, to remove, to win, to lose), using manipulable materials.

¹⁹ To explore and establish additive relationships between numbers smaller than ten, then apply it to solve problems in everyday situations.

²⁰ To express counting results verbally and symbolically, relating the number to the corresponding quantity.

common confusion for 1st Grade students. Objective 2 refers to the composition and decomposition of numbers using manipulable material and exploring characteristics of the numbering system. Objectives 3 and 4 relate to addition and its different configurations and address additive relations for single-digit numbers. Objective 5 provides work on the ability to link numbers with quantities. Objectives 1, 2, and 5 are closely related for children at the beginning of the mathematical literacy process, while Objectives 3 and 4 advance toward arithmetic operations.

For the development of these skills, the weekly lesson plan presented the activities displayed in Figure 5.



2 EM CADA POLEIRO CHEGARÁ MAIS UMA AVE. DESENHE-A E COMPLETE AS FRASES.

A) HAVIA 1 AVE.
CHEGOU MAIS 1 AVE.
FICARAM AVES.

B) HAVIA 2 AVES.
CHEGOU MAIS 1 AVE.
FICARAM AVES.

C) HAVIA AVES.
CHEGOU MAIS 1 AVE.
FICARAM AVES.

D) HAVIA AVES.
CHEGOU MAIS 1 AVE.
FICARAM AVES.

E) HAVIA AVES.
CHEGOU MAIS 1 AVE.
FICARAM AVES.

F) HAVIA AVES.
CHEGOU MAIS 1 AVE.
FICARAM AVES.

G) HAVIA AVES.
CHEGOU MAIS 1 AVE.
FICARAM AVES.

H) HAVIA AVES.
CHEGOU MAIS 1 AVE.
FICARAM AVES.

Figure 5.²¹

1st Grade Activities about Numbers (Bourdeaux, Ogliari, Rubinstein, 2017, p.67-68).

²¹ “So this is Christmas! Write in full the Hidden numbers in the back of the drawings”, “In each perch poultry will come. Draw them and complete the sentences”, respectively.

The first activity, referring to the numbers hidden in a sequence, works with the idea of a numerical series. This activity focuses on order and has little to do with quantity, which is the skill provided for in Objective 1. In the plan under analysis, the textbook makes it possible to observe the intentionality of the use of the drawing of birds both to express symbolic counting related to the corresponding number and to understand the total number of objects. Bird counting involves the additive meaning of adding more elements to an already existing collection or, in other words, a simple composition. The indications of Objective 2, referring to composition and decomposition, do not appear. The manipulable materials regarding the Objective 3 do not appear as well. The expression of the result of counts, with the indication of the relationship between quantity and number, is not contemplated in the offer for students, although present in Objective 5. In this example, in consultation with the author of the plans, the objectives were chosen after the activities and ‘adapted’ to intentions other than those explicit in the official curriculum. Thus, it is possible to assume that there was little care in the relationship between the objectives announced in the weekly plan and the proposed activities.

Conclusion

This study focused on analyzing how the activities foreseen in the lesson plans of the Literacy Cycle teachers materialize the intended objectives in the Mathematics curriculum. It was conceivable to notice a significant amount of lesson plans that do not express coherence between the announced objectives and the proposed activities. In general, this misalignment is because the activities do not approach or are not conducive to the development of the skills foreseen in the objectives. The proposed activities were much more centered on the execution of the task in isolation than on a set structure that could bring context and articulate the actions.

It is possible to advance the discussion to question how the curriculum is implemented already at the Moulded Curriculum level. This study does not present any data or inferences about the Curriculum Practiced with the students, which can be filled by the teacher's teaching and other methodological resources. However, already at the time of planning, it is clear that there is no effectiveness in proposing activities. Perrenoud (1999) states that the centrality of tasks in planning can generate a didactic problem. According to the author, if you start planning with the activities available or that you want to implement, the objectives lose their strength, as they are selected a posteriori to fit them together and fulfill the bureaucracy. Hence, if the objectives are ‘adapted’, the strength of the curriculum is faded.

Based on Menegolla and Sant'Anna (2014) and Zabala (1998), one of the problems found in lesson plans is that they reflect activity planning. That is, activities, in this model, are

the ends and not the means. From the data, the notion was that the teachers had completed the objectives of their lesson plans as a copy of the legal document. In a first glance, this is far from a problem. On the other hand, when proposing their practices, these objectives are treated as mere bureaucracy, and the proposed activities do not connect.

Finally, it is recommended to put emphasis on the importance of respecting the knowledge accumulated by the field of Didactics of Mathematics as fundamental for lesson plans, with improvisation and unintentional events having a little expression on the quality of teaching.

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