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The logical-historical movement in the childhood education: perspective for the teaching of Mathematics[1]

O movimento lógico-histórico na educação infantil: perspectivas para o ensino de Matemática

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ABSTRACT

This article aims to discuss the teaching of mathematics in early childhood education based on the logical-historical movement, using the theoretical foundations of historical-dialectical materialism and historical-cultural theory. It argues for mathematics that the teacher, from the perspective of dialectical theoretical thinking, should intentionally plan the teaching of mathematics in early childhood education. Thus, conceptual and scientific thinking is the basis of new formations and the learning process. A motive drives the concept, which is a product of social needs. We present the Teaching Guiding Activity as a theoretical-methodological basis for the formation of conceptual thinking in teaching and learning processes, and the Triggering Learning Situations as a resource for systematizing a problem that triggers the learning of a specific concept. This article is the result of theoretical and bibliographical research on the logical-historical movement. From this perspective, we present the Triggering Learning Situations as possibilities for teaching work, proposing, as an example, an activity based on the virtual history of the concept. We hope to have contributed to the defense of developmental teaching in early childhood education and the importance of learning in the development of the human psyche.

Keywords: Logical-historical movement; Conceptual thinking; Teaching mathematics; Early childhood education.

RESUMO

Este artigo tem como objetivo discutir sobre o ensino de Matemática na educação infantil com base no movimento lógico-histórico, a partir da fundamentação teórica do Materialismo Histórico-Dialético e da Teoria Histórico-Cultural. Defende-se que o ensino de Matemática seja intencionalmente planejado pelo professor na perspectiva do pensamento teórico dialético desde a educação infantil. Destarte, o pensamento conceitual e científico é a base das neoformações e do processo de aprendizagem. O conceito é produto das necessidades sociais, sendo, assim, direcionado por um motivo. Apresenta-se a Atividade Orientadora de Ensino como base teórico-metodológica para a formação do pensamento conceitual nos processos de ensino e aprendizagem e as Situações Desencadeadoras de Aprendizagem como recurso para sistematizar um problema desencadeador da aprendizagem de determinado conceito. Este artigo é resultado de uma pesquisa teórico-bibliográfica, fundamentada no movimento logico-histórico. Nesta perspectiva, apresentamos as Situações Desencadeadoras de Aprendizagem como possibilidades para o trabalho docente, propondo, como exemplo, uma atividade baseada na história virtual do conceito. Espera-se ter contribuído para a defesa do ensino desenvolvente na educação infantil e da importância da aprendizagem no desenvolvimento do psiquismo humano.

Palavras-chave: Movimento lógico-histórico; Pensamento conceitual; Ensino de Matemática; Educação infantil.

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1 Introduction

The logical-historical movement approach is based on the perspective of historical-cultural theory, the assumptions of its precursor, Vigotsky, and the authors of this school. The central element of the historical-cultural theory is the process of humanization of the human being through the relationships established culturally throughout history. Thus, in this theoretical perspective, ontology occurs through culture, since, for Vigotsky (1996), man overcomes the biological character of other animals through culture and the social relationships established in society. It is through culture, the product of human activity, that human beings humanize and develop.

> The culture gives rise to special forms of behavior, modifies the activity of psychic functions, and builds new levels in the system of developing human behavior. This is a fundamental fact, and every page of primitive man's psychology that studies cultural psychological development in its pure and isolated form convinces us of this. In the process of historical development, social man modifies the modes and procedures of his conduct, transforms his natural inclinations and functions, and elaborates and creates new, specifically cultural forms of behavior (VIGOTSKY, 1996, p. 34, our translation[3]).

Mathematics is a historical and cultural product of humanity, and it is one of the activities that form the higher psychic functions, which consist of man's conscious behavior (VIGOYSKY, 1996). It is a language, a sign, that contributes to the development of the human psyche. Humanity has historically elaborated and transmitted mathematics, and schools, as the privileged locus for scientific knowledge transmission, underscore the importance of research and discussions in the field of didactics and the processes of teaching and learning mathematics.

[3] "La cultura origina formas especiales de conducta, modifica la actividad de las funciones psíquicas, edifica nuevos niveles en el sistema del comportamiento humano en desarrollo. Es un hecho fundamental y cada página de la psicología del hombre primitivo que estudia el desarrollo psicológico cultural en su forma pura, aislada, nos convence de ello. En el proceso del desarrollo histórico, el hombre social modifica los modos y procedimientos de su conducta, transforma sus inclinaciones naturales y funciones, elabora y crea nuevas formas de comportamiento específicamente culturales" (VIGOTSKY, 1996, p. 34).

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We used Davydov's (1982) assumptions about developmental didactics to defend mathematics teaching that prioritizes conceptual links over memorization and fragmentation. Sousa (2018) asserts that mathematics teaching in Brazil has prioritized training (LIMA, 1998, *apud* SOUSA, 2018), in a class model that consists of demonstrating the concept, followed by demonstrating how the concept works and lists of exercises for training and fixing the concept (SOUSA, 2018). What Skovsmose (2008) called the exercise paradigm prevails, with lists of "do and calculate" exercises that are disconnected from reality.

In opposition and based on the logical-historical movement, we defend dialectical theoretical thinking as the foundation for organizing mathematics teaching so that it is presented to the student in a historically and socially contextualized way, related to the reality and context of the students (SOUSA, 2018). This way,

> Students must learn to contextualize their professional activity historically and socially, asking themselves about the social meaning of the content they teach and the methods and forms they use within the framework of prevailing social relations. This means situating phenomena from the point of view of their historical-classical development (FERNÁNDEZ, 2007, p. 4; *apud* SOUSA, 2018, p. 43).

Against this backdrop, this article seeks to promote a discussion on the organization of mathematics teaching, specifically in early childhood education. In her Master's research, Biolcatti (2022) advocates a developmental approach to teaching from early childhood education, with math activities full of meaning and significance, anchored in Davydov (1988), who emphasizes the importance of teachers and schools teaching children to seek scientific knowledge.

> This doesn't mean depositing information, but teaching students to think, to develop critical thinking, and to research scientific knowledge independently. The school environment expands the child's cultural repertoire insofar as it promotes developmental

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> teaching. It thus stimulates the development of higher psychic functions, behavior, and personality. In child development, mediated activities must be planned intentional, and designed to stimulate the higher psychic functions, taking into account the specific moments of child development (BIOLCATTI, 2022, p. 44).

We now ask: how can we, in the context of teaching mathematics, promote developmental teaching from the perspective of dialectical theoretical thinking and the search for scientific knowledge with children in early childhood education? This article aims to answer this question using theoretical and bibliographical research grounded in the logical-historical movement. Without pretending to exhaust the discussions on the subject or to present a recipe for pedagogical practices, we will present possibilities for teaching work based on a learning triggering situation (SDA in Portuguese).

We initially address the theoretical assumptions of theoretical-dialectical thinking and conceptual links in math teaching. Next, we look at teaching intentionality from the perspective of cultural-historical theory, focusing on early childhood education. We also discuss the teachers who work in this segment. Finally, we attempt to answer the research question and present a proposal for a mathematics activity in early childhood education, linking literature and mathematics with a learning triggering situation based on the concept's virtual history.

2 Theoretical-dialectical thinking and conceptual links in math teaching

Before we talk about the logical-historical movement in the teaching of mathematics in early childhood education, we need to present its theoretical assumptions. According to Sousa (2018),

> The constitutive elements of the logical-historical are directly related to the concepts of: totality, reality, praxis, movement, fluidity, interdependence, mutability, immutability, moments of permanence, relativity, logic, history, process, knowledge, and thought; and the categories concrete and abstract, concept, judgment, and deduction studied by Kopnin (1978) and Kosik (2002) and are based on the dialectical materialist theory of knowledge (SOUSA, 2018, p. 44).

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To understand the logical-historical movement, therefore, it is necessary to understand the theory of Marxist historical-dialectical materialism and the concepts related to it by Sousa (2018). Let's start with the concept of totality, which is the whole, as opposed to the sum of the parts or all the facts. Kosík (1969) clarifies this when he explains that he understands totality as "a structured, dialectical whole in which or from which any fact (classes of facts, sets of facts) can be rationally understood" (KOSÍK, 1969, p. 35). Therefore, we cannot say that the combination of facts guarantees that we know reality, nor that they constitute the whole. From this perspective, understanding reality involves understanding the facts as a dialectical whole. For Kosík (1969, p. 35–36), "without understanding that reality is a concrete totality, which is transformed into a meaningful structure for each fact or set of facts, knowledge of concrete reality is nothing more than mysticism, or the unknowable thing itself."

The theory of historical-dialectical materialism and the logical-historical movement have studied and analyzed the construction of knowledge, the understanding of reality and totality, and the formation of human thought. In school education, this discussion must permeate teaching, as it is necessary to understand how students learn concepts and appropriate objective reality. It concerns the translation of objective reality into subjective thought. Kopnin (1978, p. 53) asserts that "once apprehended, the laws of the objective world become laws of thought, and the laws of the objective world represent all laws of thought."

The concept of what totality is is important because knowledge has an intrinsically relationship with the concept of totality, thus emphasizing its importance. According to Kosík (1969), understanding the whole in its units builds knowledge.

> The concept of the thing is to understand the thing, and understanding the thing means knowing its structure. The primary characteristic of knowledge is the decomposition of the whole. Dialectics does not come to thought from the outside in, or immediately, nor does it constitute one of its qualities; knowledge is dialectics itself in one of its forms; knowledge is the decomposition

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> of the whole. In a dialectical conception, "concept" and "abstraction" have the meaning of a method that breaks down the whole in order to reproduce the structure of the thing spiritually and, therefore, understand the thing (KOSÍK, 1969, p. 14).

In the historical-dialectical materialist conception, as Kosík (1969) explains, understanding reality involves understanding the totality and breaking down the whole, getting to the root of the problem. However, we cannot understand each part as an isolated part, but rather as a dialectical unity. This discussion forms the core of our research into mathematics teaching, which we approach from the perspective of Davidovian developmental didactics.

Following Sousa's (2018) concepts related to historical logic, we need to talk about praxis.

> In materialist dialectics, abstract and concrete are two types of ideas that show how our mental picture of an object changes, both in terms of how far we can see it and how deeply we can get into its essence. They express the laws of change that take place in the content of knowledge throughout its evolution. The metaphysical method distinguishes between thought as abstract and sensory experience as concrete. Hence, the movement of knowledge from sensory experience to theoretical thought is considered a loss of concreteness and multilaterality. Concrete knowledge is sensory; theoretical knowledge inevitably becomes abstract and unilateral (KOPNIN, 1978, p. 154).

What Kopnin (1978) points out is the dialectical logic of the development of thought, concepts, and scientific theories. From this perspective, thought is the result of a process of ascent from the abstract to the concrete. Likewise, cognitive activity involves the subjective and objective worlds, since man learns objective reality in his subjectivity (Sousa, 2018). It's important to acknowledge that the social world shapes man's quest to satisfy his needs, which in turn shapes the construction of knowledge. Sousa (2018) highlights another aspect of the logical-historical movement: mutability. If man moves in the direction of social needs, as these needs change, so do the laws that interest men. Thus,

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> Understanding the logical-historical nature of life means understanding the relationship between the mutability and immutability of things; the relativity that exists between human thought and the reality of life, as well as understanding that both the logical and the historical nature of life are part of the universal law, which is movement (SOUSA, 2018, p.45).

We therefore argue that the human being, as a cognizing subject, is in constant motion. In this way, the understanding of reality in its entirety and the construction of thought erupt in praxis (KOSÍK, 1969). For the author (1969), praxis is not practiced as opposed to theory but "the determination of human existence as an elaboration of reality" (KOSÍK, 1969, p. 202).

What Kosík (1969) puts before us is praxis as a human activity, since through it man distinguishes himself from other animals and his relationship to the world in its entirety. When the human being begins to understand reality not as a mere fragment, elaborates his thinking, and establishes an elaborate way of communicating, namely language, he becomes humanized through praxis.

Totality and its understanding are human activities. Sousa (2018) states that while Kopnin (1978) conceives totality through dialectics, Davydov (1982) establishes totality from the internal and external connections of the concept. Sousa argues, then, "that totality is present in the confluence between the logical-historical, because this confluence links the singular to the totality, the internal links to the external links of the concept" (Sousa, 2018, p.45). In line with Sousa (2018), we derive the totality from the logical-historical movement, thus defending the teaching of mathematics based on theoretical-dialectical thinking and the internal and external nexuses of the concept. Davydov (1982) defines the internal nexus as theoretical thinking and the external nexus as graphic or sensory representations, i.e., what is perceptible about the concept. Thus, conceptual links, which connect the external and internal links, form the foundation of scientific knowledge.

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> We know that scientific knowledge is more than just the continuation, deepening, and broadening of people's everyday experiences. It requires the elaboration of special means of abstraction, of singular analysis, and of generalization that make it possible to establish the internal links of things and their essences; it requires peculiar forms of 'idealization' of the objects of knowledge". However, pedagogical psychology and didactics, which strive for empirical theory when structuring disciplines, are unaware of these peculiarities of scientific knowledg (DAVYDOV, 1982. p. 105, our translation)[4].

The logic of empirical theory cannot permeate the teaching and learning processes if the school is the privileged locus for the transmission and assimilation of scientific knowledge. As Davydov argues, we conceive of didactics based on conceptual links, on the links that underpin concepts, which are the logic, history and abstractions of human thought (Sousa, 2018). In addition, knowledge is the result of a social construction, that is, it is part of a social need, based on a certain historical context. For Davydov (1982), "a man's thought is the movement of the forms of activity of society historically constituted and appropriated by him" (Davydov, 1982, p. 279, our translation).[5]

However, the teacher needs to present the concept based on its historical construction and the needs and motives involved. In the case of teaching mathematics, we need to bring up the history of mathematical concepts, permeated by the social needs that led to their construction, and how we use them in our daily lives to satisfy our needs and understand reality. When we present the concept to students in a contextualized way, we are moving towards meaningful learning, away from empiricist didactics.

Mathematics is a language, and, according to Vygotsky (1996), it contributes to a child's cultural development since:

[4] Sabemos que el conocimiento científico no es la simple continuación, profundización y ampliación de la experiencia cotidiana de los hombres. Requiere que se elaboren medios especiales de abstracción, de singular análisis y generalización que permita fijar los nexos internos de las cosas, sus esencias; requiere vías peculiares de "idealización" de los objetos del conocimiento'. Mas la psicología pedagógica y la didáctica, que marchan en pos de la teoría empírica. al estructurar las disciplinas desconocen de hecho estas peculiaridades del conocimiento científico (DAVYDOV, 1982. p. 105).

[5] El pensamiento de um hombre es el movimiento de formas de actividad de la sociedade históricamente constituidas y *apropiadas* por aquél (DAVYDOV, 1982, p. 279).

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> A child's higher psychic functions can only be developed through cultural development. This includes mastering the external means of culture, like language, writing, and math, as well as improving their own psychic functions, like developing free will, the ability to focus on one thing at a time, logical memory, abstract thought, concept formation, and so on (VIGOTSKY, 1996, p. 313, our translation [6]).

Given the importance of higher psychic functions and mathematics in human psychic development, intentional planning of mathematics education is necessary to foster dialectical theoretical thinking in students through conceptual linkages. Biolcatti (2022) states that, since mathematics is an instrument that mediates culture, the school should be the place to work with the developmental teaching of mathematics from early childhood education.

> This way, the teacher can stimulate the children's perception of ideas that, in the future, will allow them to make the necessary abstractions to appropriate mathematical concepts. Vygotsky (1996) asserts that school provides the ideal environment for children to transition from understanding quantity through object representation to mastering numerical operations through sign and number mastery (BIOLCATTI, 2022, p. 56).

Next, we'll talk about the intentionality and work of teachers in early childhood education.

3 Teaching intentionality: considerations on teaching in early childhood education

Planning is necessary for intentional teaching activities. Therefore, we must deliberate on the methods, locations, and approaches for guiding these activities. When it comes to early childhood education, it is still common to mistakenly associate the teacher as a mere caregiver. Biolcatti (2022) approaches this problem

[6] "El desarrollo de las funciones psíquicas superiores del niño sólo es posible por el camino de su desarrollo cultural, tanto si se trata de dominar los medios externos de la cultura tales como el lenguaje, la escritura, la aritmética, como por el perfeccionamiento interno de las propias funciones psíquicas, es decir, la formación de la atención voluntaria, la memoria lógica, el pensamiento abstracto, la formación de conceptos, el libre albedrío, etc." (VIGOTSKY, 1996, p. 313).

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from the perspective of Didonet (2001) and the historical process of building nurseries and pre-schools, which, before reaching their current configuration, took on a welfare and custodial role (Didonet, 2001).

Day-care centers emerged in the historical context of the Industrial Revolution, with the occupation of women in the factory scene. Mothers had no one to leave their children with, and nurseries emerged as institutions to care for the children of factory workers. According to Didonet (2001),

> These historical, social, and economic factors determined the main characteristics of the traditional daycare model. Wealthy families could afford to hire a nanny, whereas impoverished families had to either leave their children unattended or send them to an institution. For the children of working women, the nursery had to be full-time; for the children of low-income workers, it had to be free or charge very little; or to look after the child while the mother was working outside the home, it had to look after the child's health, teach hygiene habits, and feed the child. Education remained the family's business. This origin determined the relationship between daycare and poor children, as well as the welfare nature of daycare (DIDONET, 2001, p. 12).

In Brazil, with the 1988 Federal Constitution, which guarantees early childhood education as the state's duty to provide it [7], and with the 1996 Law of Guidelines and Bases (LDB in Portuguese), which integrated daycare into the Brazilian education system and established early childhood education as a stage for the integral development of the child in its physical, psychological, intellectual, and social aspects, early childhood education began to take on a different role from that of assistance, philanthropy, and care.

However, despite the advances made in legislation and studies and research in the area of early childhood education, we still see the devaluation of this stage, with teachers commonly less valued and more poorly paid (BIOLCATTI, 2022).

[7] Art. 208. The State's duty towards education shall be implemented by guaranteeing:
[...]
IV - nursery and pre-school education for children up to 5 (five) years of age;

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> Martins (2012) points out that the vision of the nursery school as a place for care only persists, reinforcing the "pedagogy of waiting." In the "pedagogy of waiting," childcare prevails until children develop and can learn (BIOLCATTI, 2022, p. 21).

Unlike the "pedagogy of waiting," historical-cultural theory argues that learning is the fundamental condition for development. What's more, we advocate an education that encourages conceptual and scientific thinking from an early age. Children have needs and motives that develop through activity (LEONTIEV, 1978). That said, the school plays a fundamental role in children's development through teacher mediation. In this sense, Souza (2013) emphasizes that

> Children are born at a certain historical moment and develop through their social relationships with the world around them. Therefore, at birth, they are already social beings with rights and need to develop typically human skills. The adult's role is to be the bearer and mediator of the forms of action and conduct that the child must carry out within the social context to which they belong. In this way, the appropriation of culture cannot take place without an adult. In this sense, teaching plays a guiding role in psychological development because, through it, the child assimilates new actions. However, it is necessary to take into account the facts already known by the child, as they are fundamental to supporting their new knowledge. (SOUZA, 2013, p. 30-31).

This is why teaching cannot be presented in a way that is disconnected from the student's reality. The teacher needs to present the concepts based on the historical and social relationships that surround them. They also need to show that the concepts arose from a problem, from a human need, so that learning has meaning and significance. In the next section, we will discuss a proposal for teaching mathematics in early childhood education from the perspective of triggering learning situations (SDA), according to Moura (1996). In no way do we intend to provide a recipe or a manual for teaching in early childhood education, but rather to show possibilities in order to contribute to developmental teaching at this stage.

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4 Literature, mathematics and the virtual history of the concept: a proposal for developmental teaching

So far, we have explained our theoretical perspective of cultural-historical theory and the central elements that underpin this article, namely developmental didactics and the logical-historical movement. We also highlight the importance of intentional teaching activities. Puentes and Longarezi (2013) emphasize intentional teaching as the object of developmental didactics, in the triad of teaching, learning, and development. Learning, therefore, is a condition for the development of the student's neoformations and personality through intentional teaching.

Theoretical and scientific thinking should be the basis of teaching from an early age. Davydov (1986) emphasizes that the concept, not the object, should mediate learning, leading to the appropriation of the concept and its conceptual links. In this way, conceptual thinking takes place through the signification of the concept and the abstraction of the relationships that the concept establishes. We have already emphasized the need to present the concept in a contextualized manner, imbued with meaning, significance, and motivation. Therefore, we must guide pedagogical activity with collectively created needs, corroborating a meaning-forming motive.

> The first condition of all activities is necessity. However, necessity in itself cannot determine the concrete orientation of an activity because it is only in the object of the activity that it finds its determination; it must, so to speak, find itself in it. Once the object "objectifies" the need, it becomes the motivation for the activity, stimulating it (LEONTIEV, 1978, p.115).

The idea of the activity as a need or as a problem to be solved is an element of the Teaching Guiding Activity (AOE in Portuguese), which incorporates a theoretical-methodological basis for the development of theoretical thinking for those who teach and for those who learn (Moura, 2001). From the AOE perspective, there are triggering learning situations, which start with a triggering problem. Oliveira and Panossian (2021) elucidate that in 1996, the term emerged with more defined forms for the triggering problem through the virtual history of the concept,

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games, and situations emerging from everyday life. We use games as a didactic tool to establish relationships between concepts, and we base emergent everyday situations on problem situations from students' real-world experiences to facilitate concept learning. In this article, we concentrate on the virtual history of the concept, as described by Moura (1996):

> Characters from children's stories, legends, or the history of mathematics present these problem situations as triggers for the child's thinking, involving them in the construction of solutions that are part of the story's context. In this way, counting, calculating, and recording can become a real necessity for them (MOURA, 1996, p. 20).

After conceptualising the concept's virtual history, we will present a proposal for teaching mathematics in early childhood education. We reiterate that this is not a manual of pedagogical practice, but an example of the countless ways of working with situations that trigger learning.

The 2018 National Common Core Curriculum (BNCC in Portuguese) identifies "Spaces, Times, Quantities, Relationships, and Transformations" as one of the mathematical thinking-related fields of experience for early childhood education (BRASIL, 2018). Many pedagogical opportunities exist for teaching mathematics in early childhood education. In this article, we will present a proposal for children aged 4 to 5, aimed at developing the following skills listed in the document:

> (EI03ET01) Establishing comparative relationships between objects by observing their properties.
> [...]
> (EI03ET05) Classifying objects and figures according to their similarities and differences.
> [...]
> (EI03ET09) Express measurements (weight, height, etc.) by constructing basic graphs (BRASIL, 2018).

Starting from the perspective of the concept's virtual history and also using children's literature, we used the book “Who will get the peach?” by Ah Hae Yoon (2010).

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Table 1 - Triggering learning situation

Virtual concept history	
School Content	Quantities and measurements
Target Audience	Children aged 4 and 5
BNCC skills	(EI03ET01), (EI03ET05) and (EI03ET09)
Objectives	Developing the notion of units of measurement;
Materials	Comparing and classifying objects using various units of measurement;
Development	At first, the teacher can have a circle to tell the story from the book: Who will get the peach? There was a big ripe peach that smelled very good and looked delicious. Who will get the peach? The tall giraffe, the big-mouthed crocodile, the heavy rhinoceros, the clever monkey, the hopping rabbit and the restless caterpillar all wanted to eat the peach. The tall giraffe, stretching his neck even further, said: -"How about the tallest of us gets the peach?" -You see? I'm the tallest. So the peach should go to me." -"Stop!" Said the heavy rhinoceros, hitting the ground hard. How about the heaviest of us gets the peach?" -"See? I'm the heaviest. So I should get the peach." -"Rubbish!" Said the crocodile. -"How about whoever has the biggest mouth gets the peach?" -"See? I have the biggest mouth. So I should get the peach."–" Wait!" Said the hopping rabbit -"How about whoever has the longest ears gets the peach? -"That's not right!" said the clever monkey. -"How about whoever has the longest tail gets the peach?" -"That's really unfair!" The restless caterpillar shouted: -"Why should the tallest, the heaviest, the one with the longest tail get the peach? -"In order of height, starting with the shortest, I'm first." -"In order of weight, starting with the lightest, I'm first." -"In order of mouth size, starting with the smallest, I am the first." - In order of ear size, starting with the shortest, I am first." - "In order of tail size, starting with the shortest, I am first. I'm first on all counts. So the peach should be mine." The caterpillar cut a small hole in the peach's skin and quickly crawled inside to eat it (YOON, 2010). After reading the book, the teacher can present objects to the children and ask them to compare them using different units of measurement. For example, they could present a sheet of paper and a stone. Then ask which is bigger in size. The students will answer that it's paper. Then the teacher can ask which is heavier and allow the children to manipulate the two objects. They will then answer that the stone is

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	heavier. The teacher can then go on to compare the objects in the classroom, classifying them as bigger and smaller, lighter and heavier, wider and narrower, and so on. Then, put into context that there have been different units of measurement created to meet social needs throughout history. Using a tape measure or ruler, say that the meter is the unit we use for length. Using a scale, say that the kilogram is the unit of mass. Using a measuring cup, show that the liter is the unit for measuring volume. Finally, you could say that we can create measurement criteria (hands, feet, and fingers) and explore these unconventional units of measurement with the children, asking them to measure objects in different ways and compare and classify them.

The author elaborated on the source.

The proposed activity is just one example of how to use literature and the concept's virtual history to develop mathematical thinking in children. It is also possible to use games and situations that arise from everyday life as triggers for learning (MOURA, 1996). Teachers' work does not follow a manual; they work with different people and realities, so each teacher will know how to design the activity that best suits their context.

The aim of this article, however, was to discuss and defend developmental teaching based on dialectical theoretical thinking and conceptual links from early childhood education onward. In addition to the theoretical basis presented, we sought to illustrate an SDA in order to exemplify and emphasize this perspective for teaching and learning mathematics. Within the vast field of activities and content, we present a single activity and a piece of mathematical content for teachers to explore. The activity presents the concept of quantities and measures as essential, initially in the story to determine who will get the peach, then for classifying and comparing objects in the classroom, and finally for various everyday situations, adhering to Davydov's (1982) understanding of the concept's internal and external links.

5 Final considerations

This article aims to provide theoretical and practical contributions to the teaching of mathematics in early childhood education, based on the assumptions of cultural-historical theory. We presented the concepts relating to the logical-historical movement, namely dialectical theoretical thinking and conceptual links.

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Additionally, we introduced the concept of developmental didactics and advocated for its application in mathematics education, challenging conventional didactics and practice paradigms.

In this sense, we emphasize that students should find meaning and significance in their learning, and that we should present the concept in a way that contextualizes it with its history and the social needs and reasons that preceded its creation. In this way, students are able to establish relationships between the concept and their everyday lives. Thus, we present AOE and SDA as didactic methodological tools.

From this perspective, the teacher is the agent of mediation of the mathematical content in the teaching and learning process, and their activity is intentional. The teacher acts in the student's learning and, consequently, in the development of their neoformations and personalities. Considering the importance of intentionality, this article presents a proposal for teaching work with a learning trigger situation involving the virtual history of the concept of teaching quantities and measures. It highlights mathematics as a social and cultural element, historically produced by humanity, that acts to mediate human activity and the development of higher psychic functions.

We do not want to provide a manual for teachers' work; rather, we want to contribute to defending the possibility of working in the direction of developmental teaching from early childhood education onward. Far from wanting to provide a manual for teachers' work, we seek to contribute to defending the possibility of working in the direction of developmental teaching from early childhood education onwards.

El movimiento lógico-histórico en la educación infantil: perspectivas para la enseñanza de las Matemáticas

RESUMEN
Este tiene por objeto discutir la enseñanza de las matemáticas en la educación infantil a partir del movimiento lógico-histórico, utilizando los fundamentos teóricos del Materialismo Histórico-Dialéctico y de la Teoría Histórico-Cultural. Se argumenta que la enseñanza de las matemáticas debe ser intencionalmente planificada por el profesor en la perspectiva del pensamiento teórico dialéctico desde la educación infantil. Así, el pensamiento conceptual y

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científico es la base de las nuevas formaciones y del proceso de aprendizaje. Los conceptos son el producto de necesidades sociales y, por tanto, están impulsados por un motivo. La Actividad Orientadora de la Enseñanza se presenta como la base teórico-metodológica para la formación del pensamiento conceptual en los procesos de enseñanza y aprendizaje y las Situaciones Desencadenantes del Aprendizaje como un recurso para sistematizar un problema que desencadena el aprendizaje de un concepto determinado. Entre los tipos de Situaciones Desencadenantes de Aprendizaje, que son la historia virtual del concepto, los juegos y las situaciones emergentes de la vida cotidiana, utilizamos como ejemplo de propuesta de trabajo docente una actividad basada en la historia virtual del concepto. Esperamos haber contribuido a la defensa de la enseñanza desarrolladora en la educación infantil y de la importancia del aprendizaje en el desarrollo del psiquismo humano.

Palabras clave: Movimiento lógico-histórico; Pensamiento conceptual; Enseñanza de las matemáticas; Educación infantil.

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