

A formação de conceitos e suas contribuições para o desenvolvimento de crianças na Educação Infantil

The formation of concepts and their contributions to the children's development in the Childhood Education

Eliane Nicolau da Silva¹
Maria Aparecida Mello²

ABSTRACT

This article is part of doctoral research and has as goal to discuss the importance of the formation of concepts in the Childhood Education and its possibilities to potencialize the five years old children's learning. The analysis founded itself in the Cultural-Historical Theory. The results achieved showed that in the teacher's practice is possible to prioritize the formation of the concepts in children of the five years old, in order that this learning make sense for them live. The teacher's activities organization showed itself as one of the important factors for the learning of the concepts. For that, is necessary, initially, to execute a diagnostic observation about children's learning of the concepts needs and, still, such organization be must intentionally planned by teacher, specially, through of the collective activities, in order to capture the children's different visions about de same concept.

Keywords: Concept formation. Historical-Cultural Theory. Preschool.

RESUMO

Este artigo é parte de pesquisa de doutorado e tem como objetivo discutir a importância da formação de conceitos na Educação Infantil e suas possibilidades de potencializar as aprendizagens das crianças de cinco anos. As análises fundamentaram-se na Teoria Histórico-Cultural. Os resultados alcançados mostraram que na prática docente é possível priorizar a formação de conceitos em crianças de 5 anos de idade, de modo que essas aprendizagens tenham sentido para a vida delas. A organização das atividades docente apresentou-se como um dos fatores importantes para a aprendizagem dos conceitos. Para tanto, é necessário, inicialmente, realizar observação diagnóstica com foco nas necessidades das crianças em relação à aprendizagem dos conceitos, e, ainda, tal organização necessita ser planejada intencionalmente pelo docente, especialmente, em atividades coletivas, de modo a captar as diferentes visões das crianças sobre o mesmo conceito.

Palavras-chave: Formação de conceito. Teoria Histórico-Cultural. Educação Infantil.

¹ PhD in Education. Department of Education – Universidade Federal de São Carlos, UFSCar. Graduate Program in Education, São Carlos, Brazil. Orcid: <https://orcid.org/0000-0002-4827-7434>. E-mail: eliane.nicolausilva@gmail.com.

² Senior Professor, Department of Pedagogical Theories and Practices (DTPP) - Federal Universidade Federal de São Carlos (UFSCar), São Carlos, Brazil. Orcid: <https://orcid.org/0000-0003-24047957>. E-mail: mmello@ufscar.br.

1 Introduction

This article focuses on the development of concepts in early childhood education, emphasizing the importance of practices that promote conceptual thinking. The text includes excerpts from doctoral-level³ research involving five-year-old children.

In early childhood education, the development of practices that intentionally include concept formation is not always considered. Conceptions of child development based on biological factors remain common in practices developed for this age group. This can lead to a lack of reflection on concept formation.

Teaching practices based on the idea that biological development is the predominant factor perpetuate the notion that the reasons for success or failure in development lie with the children. Within this view, the child's maturity becomes the parameter for learning. With this conception, a child's ability to formulate hypotheses and express thoughts becomes dependent on biological maturity.

To better understand learning and development processes, it is essential to study Historical-Cultural Theory further, as it provides the necessary basis for this understanding. Within this perspective, human beings are conceived as historical and social subjects.

Children establish contact with culture and society from a very young age. The social relationships that permeate their existence are essential to their development. Vygotsky (1995) argues that individual characteristics form from social relationships and collective coexistence. Thus, early childhood education plays a fundamental role in children's development.

³ SILVA, Eliane Nicolau da. The formation of scientific concepts in five-year-old children based on systematized mediations. 2020. 146 f. **Thesis** (Doctorate in Education) - Universidade Federal de São Carlos, São Carlos, 2020. Available at: <https://repositorio.ufscar.br/handle/ufscar/12385>.

This role goes far beyond the welfare-based approach that has long been perpetuated in Brazil and still leaves its mark on the school environment.

Teachers must understand and deepen their knowledge of concept formation to plan their practices effectively. These are also fundamental elements of children's learning and development processes, expanding spontaneous knowledge towards scientific knowledge.

A practice focused on concept formation in early childhood education is possible as long as it is well planned. Practices that meet children's needs through actions in line with their main activity at a given moment are essential for developing teaching practices that transform spontaneous knowledge into scientific knowledge (Leontiev, 2004). (Vygotsky, 2007).

Our goal is to discuss the importance and possibilities of concept formation in early childhood education. To this end, we explored some key concepts of Historical-Cultural Theory in depth to contribute to the didactic transformation of teaching practices to enhance children's learning and development. These concepts include concept formation, spontaneous and scientific concepts, mediating activity, higher psychic functions, the zone of proximal development, and language.

2 Concept formation

The process of concept formation is essential for the development of students' conceptual thinking throughout their schooling, since the latter is one of the higher mental functions that only humans develop through culture and, according to Vigotsky (2006), should be the main goal of education, since it is through this function that we understand the reality and essence of objects.

Thinking in concepts is the most appropriate means of understanding reality because it penetrates the inner essence of objects, since their nature is not revealed by direct contemplation of one object or another in isolation, but rather through the connections and relationships that are manifested in the dynamics of the object, in its development linked to the rest of

reality. The internal link between things is discovered with the help of conceptual thinking, since developing a concept about an object means discovering a series of connections and relationships between that object and the whole of reality, which means including it in the complex system of phenomena. (VYGOTSKI, 2006, p. 78-79)

Therefore, teachers and professors must recognize the importance of prioritizing concept formation in early childhood education to establish the basis for developing theoretical thinking in later stages of schooling.

Vygotsky (1995) investigated the higher mental functions, which are linked to the social relationships established between people, between people and objects in different spaces, and the instruments produced by human beings. These mental functions develop through the external processes of appropriating human culture and experiences in society. Vygotsky (1995) presents two groups of higher mental functions. The first group refers to processes such as language formation, writing, calculation, and drawing. The second group concerns special mental functions such as voluntary attention, voluntary memory, and theoretical thinking.

Conceptual thinking and concept formation correspond to the second group. However, these two higher mental functions are interconnected with the higher mental functions of the first group, despite being distinct. Thus, learning concepts enhances learning written language, language development, mathematics, and drawing, which are produced throughout human development and societies.

Language plays an important role in thought development. According to Vygotsky (2001), although thought and language have different origins, their relationship is fundamental. An important milestone in child development occurs when these elements come together, when thought becomes verbal and language becomes intellectual.

By communicating with others, establishing social relationships, asking questions, expressing curiosities and hypotheses about observed phenomena,

and acquiring new knowledge, children expand their vocabulary and evolve their thinking. Regarding thought and language, Vigotsky (2001, p. 116) states, "Children's thinking evolves in accordance with their mastery of the social media of thought, that is, language." One of the key concepts of Historical-Cultural Theory is the zone of proximal development, which Vigotsky (2006, p. 268) defines as follows:

A child who can perform a task with an adult's guidance today will be able to perform that task independently tomorrow. Therefore, when we clarify a child's ability to perform a task with an adult's guidance, we simultaneously determine the stage of their intellectual development that will bear fruit in the next stage of development. In this way, we can determine their actual level of intellectual development. Thus, investigating what a child can do independently reveals their development on a given day, while investigating what they can do collaboratively reveals their development the following day. The sphere of immature processes that are in the process of maturing shapes the child's zone of proximal development (Vygotsky, 2006, p. 268).

In Historical-Cultural Theory, the concept of human development encompasses the biological apparatus but prioritizes the cultural aspect as the predominant element in the development of higher psychic functions. According to Schúkinia (1978), human learning and development must be capable of transforming society by going beyond knowledge itself. Thus, the zone of proximal development refers to learning and development that is about to occur but which may not be effective without collaboration with an adult, another child, or powerful mediators. Therefore, a teacher's intentional mediation is key to enabling children to develop their learning and perform an activity autonomously later, even if they cannot do so at the present moment.

These two processes, learning and psychological development, can be positively or negatively influenced because they depend on intentional external mediation. However, positive learning and psychological development depend on the depth of the teacher's activity planning, the level of

intentionality regarding activities and content to be carried out with children, the potential of mediating resources, and, above all, the mediations developed throughout activities. It is also essential to reflect on activity planning so that it is appropriate to children's learning needs, which are identified before, during, and after this process.

This means that teachers must understand the concepts they are teaching so they can organize appropriate learning activities for their students.

Monteiro (2013, p. 12) reiterates the importance of intentionally organizing teaching activities: "The teacher who organizes the teaching-learning process must understand that producing this system of interaction involves carrying out actions or learning activities together."

Knowledge of the zone of proximal development is essential to identifying learning and development. Working in the zone of proximal development does not mean developing what the child has already learned; rather, it means advancing what they can learn through planned external collaboration.

Vygotsky (2007) explains that thought formation goes through several stages: the basis of concept formation, syncretic development, and conceptual thinking itself.

These stages do not occur linearly and are not related to chronological age. Rather, advances in development depend on the stimuli and context to which each child has access throughout this process. Concept formation involves what Vygotsky (2007) calls spontaneous and scientific concepts, which are related to each other in this process despite being distinct.

According to Vygotsky (2007), scientific concepts are linked to scientifically proven knowledge, whereas spontaneous concepts have no scientific basis. He explains that, although these concepts follow opposite paths, they are interconnected. This means that new learning can elevate spontaneous concepts to the level of scientific concepts.

This advance in the development of spontaneous concepts to scientific concepts results in a conscious and voluntary understanding of knowledge. Vygotsky (2007) discusses this important factor as follows:

The development of spontaneous concepts begins in the concrete and empirical sphere and moves toward the higher properties of concepts: conscious understanding and volition. [...] This explains, on the one hand, that the development of scientific concepts presupposes a certain level of spontaneous concepts, a level at which they appear in the zone of proximal development. Conscious understanding and volition, on the other hand, are scientific concepts that transform and elevate spontaneous concepts to a higher level, shaping their zone of proximal development, since what the child knows how to do today in collaboration, he will know how to do tomorrow on his own (VIGOSTKY, 2007, p. 377).

In this brief overview of the elements involved in the concept formation process, we discussed how essential it is for teachers to understand each of these elements to plan pedagogical practices that build the foundation for promoting children's learning and development. This requires a diagnostic assessment of spontaneous concepts based on children's needs in relation to these concepts to expand their knowledge and transform spontaneous concepts into scientific ones.

Thus, building the foundations for concept formation is important from early childhood education onwards. Overcoming the conception that children are not mature enough for knowledge is an important step in this stage of education.

Finally, the goal is not to overschool children in early childhood education. Organizing teaching activities around play is important for maximizing learning in children from birth to age five. However, the playful nature of children's activities should facilitate the development of higher mental functions important for life in society. Concept formation is one of these functions that deserves the attention of those involved in children's education.

2.1 The formation of concepts in everyday Early Childhood Education

According to Historical-Cultural Theory, conceptual thinking is a higher psychological function that is necessary for human development. The process

of forming concepts is the basis of conceptual thinking development. Therefore, children must acquire knowledge comprehensively so they understand the meaning and significance of the concepts involved. The more that concepts are taught to children based on scientific principles rather than spontaneous thinking, the more opportunities they have to develop conceptual thinking throughout their schooling. From this perspective, we can say that, in early childhood education, this process may already be underway depending on how concepts are presented to children.

Thus, it is important for teachers to understand how early childhood education (ECE) children appropriate concepts based on their experiences (diagnostic assessment) and organize activities that promote learning and development based on the children's needs.

Garay (2016) discusses the development of conceptual thinking in children and points out the need for pedagogical practices to move toward this goal.

The basis for the development and formation of conceptual thinking in children is the establishment and improvement of the actions and content of the teacher's activities, who is the main mediator for enhancing the development of Higher Mental Functions, a task performed in the Zone of Proximal Development (GARAY, 2016, p. 215).

Thus, understanding the formation of concepts as the basis and driving force behind the development of conceptual thinking should be the main objective of education. Regarding transformations in the development of thinking in relation to activity and consciousness, Vygotsky (1997) says:

The dynamics of thought are not the dynamic, specularly reflected relationship that dominates in the real situation. If thought did not change anything in dynamic action, it would be absolutely unnecessary. Certainly, life determines consciousness. It arises from life and forms only one of its moments. But once born, thought itself determines life, or more precisely, thinking life determines itself through consciousness. As soon as we separate thought from life, from dynamics and

necessity, we deprive it of all activity, we close all paths to the revelation and clarification of the properties and most important mission of thought: to determine the way of life and behavior, to modify our actions, to give them direction, and to free them from the concrete situation (VYGOTSKI, 1997, p.269).

In this development process, an important concept explored in depth by Leontiev (2004) is essential, namely that of motivation. Motivation is what triggers new learning needs that influence developmental progress.

[...] shifting the motives for the purposes of actions allows us to understand psychologically how new needs can arise and how their type of development is transformed. The first condition of all activity is a need. However, in itself, the need cannot determine the concrete orientation of an activity, for it is only in the object of the activity that it finds its determination: it must, so to speak, be found in it. Once the need finds its determination in the object (if it is objectified in it), the said object becomes the motive for the activity, that which stimulates it (LEONTIEV, 2004, p.115).

Paying attention to children's motives and learning needs is key to developing a pedagogical practice that intentionally considers the formation of concepts.

The concepts of meaning and significance are also present in this process, as discussed by Leontiev (1998). The author explains that meaning is socially constructed; for example, consider the functions of objects. Meaning is also personal; each person attributes different meanings depending on their context and experience. Leontiev's (1988) studies demonstrate the importance of these concepts, which are indispensable at the planning stage because they are an integral part of children's learning and development process, promoting advances in higher mental functions.

Identifying or creating these needs requires teachers to attentively observe children's speech, actions, and play during various moments in the school routine. Observation is a fundamental element in learning and developmental processes. It helps teachers identify children's cultural needs and direct their pedagogical practices toward them.

As Mukhina (1995, p. 17) says, "Observation is indispensable for the initial collection of data."

Observing is an action that requires planning. Teachers must be clear about what, why, how, where, when, and, above all, whom to observe. The choice of location and observation situations is essential for guiding pedagogical practice.

In everyday school life, this type of diagnostic observation can be planned through classroom activities, activities in the park, field trips, and other activities. The important thing is for teachers to know what to observe to help children develop scientific concepts.

At the same time, observation goes beyond its diagnostic function and should occur throughout the learning process. Observation allows teachers to reflect on their teaching practice and organize their plans.

According to Vigotsky (1995), when observation is planned, the information is not superficial. It is possible to discover the origins of the phenomenon being observed.

Smirnov (1960) emphasizes the importance of observation in his studies, as it allows teachers to better perceive the elements that guide their teaching practice, greatly influencing the relationship between perception and how it is perceived.

Teachers can improve their pedagogical observation by developing an observation script that focuses on what they intend to study during an activity. This tool is essential in schools so that teachers can carry out a detailed analysis of observed situations and identify possible learning opportunities within the zone of proximal development. Above all, it directs teaching practices towards developing these learning opportunities.

Another essential procedure for developing this pedagogical practice in Early Childhood Education is the teacher's intentional mediation activity. Based on diagnostic assessments, the teacher develops systematic mediations according to the children's learning needs.

According to Historical-Cultural Theory, mediation is a key concept because it is directly linked to social relationships that promote learning and human development. Vygotsky (1995) defines it as follows:

The application of auxiliary means and the transition to mediating activity fundamentally reconstruct the entire psychic operation, just as the application of tools modifies the natural activity of organs and infinitely expands the system of activity of psychic functions. (VIGOTSKY, 1995, p. 95)

Teaching practices based on intentional, systematic mediation promote changes in children's initial hypotheses about developing concepts. These practices also enable teachers to identify learning activities within the child's zone of proximal development and create cultural experiences based on acquired knowledge.

Thus, if planned in accordance with the objectives of the activities to be developed with children, systematic mediations play an important role in teaching and learning processes. Unexpected interventions are common during the learning process because children are active and generate questions and curiosity by raising hypotheses about their experiences. In these situations, it is essential that teachers are masters of the subject so they can intervene appropriately or suggest that they find the answers together with the children. The important thing is that children's hypotheses are the starting point for searching for scientific knowledge.

Through systematic mediation using communication and other mediators, the learning process favors the development of higher mental functions, such as voluntary attention and memory. One result of this doctoral research indicated that systematic mediation using mediating objects transformed children's initial thinking about the concepts they needed to advance.

Furthermore, they demonstrated that concept formation can be incorporated into early childhood education based on children's needs using pedagogical practices and content that are already part of everyday life.

The first factor that enabled these results was the researchers' careful observation of children's behavior. Conversation circles, for example, are a common activity in early childhood education, and when planned well, they can develop children's language skills.

The careful observation of children's speech and behavior was the first main factor that enabled these results. Conversation circles, for example, are a common activity in early childhood education. When well planned, they can enhance the transition from spontaneous to scientific knowledge. In this study, we organized a conversation circle to identify the children's hypotheses about the beach. We had observed them discussing this topic while playing in the park. Since we noticed differences in their understanding of the concept, we developed a mediating activity that contrasted the spontaneous and scientific concepts simultaneously. To accomplish this, we brought objects, images, and videos to the conversation circle to enhance learning of the concept. In later activities, we used other mediators, such as stories, experiments, and games, to help the children reflect on their initial hypotheses and understand the scientific concept of the beach.

The conversation circle is a valuable tool for exploring scientific concepts when it is not limited to an oral presentation where the teacher merely imparts knowledge. As its name suggests, it should encourage conversation and the exchange of experiences. This activity should stimulate communication and language. Additionally, incorporating other resources to develop content or generate conversation topics makes this activity an important learning and development opportunity. (Silva, 2020, p.)

The interesting thing about the teacher-designed mediating activity is that it allows children to explore knowledge within their zone of proximal development. This zone emerges when a concept is being worked on because children verbalize related concepts that require attention. For example, when the initial diagnosis pointed to the concept of the beach, the children confused sand and waves while working with the mediators. They also had various spontaneous conceptions of waves, rain, and the sun.

Throughout the research period, the formation of sand and waves was one of the topics addressed. During the research period, there was a long holiday, and one child reported that she was going to the beach with her family. It would be her first time at the beach, and she said:

Bianca: Teacher, my mom said we're going to the beach.
Researcher: That's great, Bianca! You must be very happy.
Bianca: I am. And I already told my mom that waves are formed by the wind and that sand is formed from rocks.
Researcher: Wow! You explained to her what you learned.
Bianca: Yes, since we're going to the beach, she needs to know that.
Researcher: Very good! Tell me what you thought of the beach later.
Bianca: I will.

Source: Silva (2020, p. 114)

In this dialogue, we observe the use of explanatory language, which, according to Mukhina (1995), is a special type of language in which a child feels the need to explain the rules of a game or how something works to their interlocutor. By explaining the formation of waves and sand to her mother, Bianca demonstrates this need.

Through her explanation, Bianca shows that she understands the basics of the concept because she has given meaning to its function and applied her knowledge to a different social context. The socially constructed meaning of the concept has acquired personal significance.

By applying this concept, we can conclude that Bianca's thinking has advanced, as she has developed a more logical and rational relationship with these phenomena, a characteristic of complex thinking. Luria (2012) points out that this transformation is difficult for children but establishes the necessary foundation for abstract thinking.

It is essential to plan the interventions that will be carried out with the children in the circle within this process. Some important intentional actions to enhance learning and development include planning the questions that will

be directed at the children to raise hypotheses and preparing the introduction of scientific knowledge.

Thus, the direction of the activity is another fundamental element to which teachers must pay attention, as it can contribute to its success or failure. Galperin (2009) discusses providing this guidance through the Guiding Basis of Action (BOA) concept. According to the author, the BOA plays a fundamental role in concept formation. "The type of guidance determines the type of action formation and the type of final product, as they form a unique type of learning" (Galperin, 2009, p. 77).

It is important to reflect on the type of questions that will be asked in the circle and how the activity will be guided because the way these questions are asked may or may not encourage the children to reflect on the topic being discussed. When a question is not well formulated, it becomes difficult to make a diagnosis and enable the child to express their hypotheses. Additionally, we risk inducing the child's response.

Working with these concepts helped children develop an understanding of mathematics, writing, science, body movements, balance, and gross and fine motor skills, among other subjects specific to early childhood education. Therefore, intentional mediation is an integral part of early childhood educators' pedagogical practice, not just an assignment.

The conversation circle is just one tool that can enhance concept formation in early childhood education. Other tools, such as drawing, building games, role-playing games, court games, and ball games, can also be important mediators for working with concepts. These are tools with which teachers are already familiar. Nevertheless, we reiterate that, to become powerful mediators, they must be included in intentional mediating activities by teachers. The first step is a diagnostic assessment using observation to identify children's needs regarding the subject. Choosing materials, spaces, activities, interventions, records, and prioritizing the playful aspect are important in this process. However, without proper intention regarding how and why to use these tools, they lose their pedagogical value.

3 1 Final considerations

Based on the discussions presented in this article, which summarize the results of the conducted research, we conclude that concept formation should be included in early childhood education planning. This can be achieved by enhancing existing pedagogical activities with young children.

Observing children intentionally during their activities and in different areas of the school is an important teaching practice that helps identify children's learning needs. Additionally, this approach promotes teaching within children's zones of proximal development, fostering independence in relation to acquired knowledge.

Thus, intentionality and planning remain the defining characteristics of teachers who strive to transform their pedagogical practices and the learning processes of their students. Teaching children to transition from spontaneous to specific concepts is integral to this transformation and enhances the learning and developmental processes of children from birth to age five.

References

GALPERIN, P. YA. Tipos de orientación y tipos de formación de las acciones y los conceptos. In: ROJAS, Luiz Quintanar; SOLOVIERA, Yulia. *Las funciones psicológicas en el desarrollo*. Ed. Trilhas México, 2009, p. 76-79.

GARAY GONZÁLEZ, A. G. *Fundamentos da teoria histórico-cultural para a compreensão do desenvolvimento do pensamento conceitual de crianças de 4 a 6 anos*. Tese (Doutorado). Universidade Federal de São Carlos, São Carlos, 2016.

LEONTIEV, A. N. *O desenvolvimento do psiquismo*. Rubens Eduardo Frias (Trad.). 2.ed. São Paulo: Centauro, 2004.

LEONTIEV, A. N. Os princípios psicológicos da brincadeira pré-escolar. In: VIGOSTSKY, Lev Semenovich; LURIA, Alexander Romanovich; LEONTIEV, Alexis N. *Linguagem, desenvolvimento e aprendizagem*. São Paulo: Ícone, 1988. p. 119-142.

MUKHINA, V. *Psicologia da Idade Pré-Escolar: Um manual completo para compreender e ensinar a criança desde o nascimento até os sete anos*. Cláudia Berliner (Trad.). São Paulo: Martins Fontes, 1995.

MONTERO, R. P. *La Zona de Desarrollo Próximo (ZDP). Procedimientos y Tareas de Aprendizaje*. Habana: Pueblo y Educación, 2013.

SCHÚKINA, G. I. *Los intereses cognoscitivos en los escolares*. Ciudad de La Habana: Impresoras Gráficas, MINED, 1978. 225 p.

SMIRNOV, A. A.; LEONTIEV, A. N.; RUBINSHTEIN, S. L.; TIEPLOV, H. M. *Psicologia*. Ed. Grijalbo. México, 1960.

SILVA, E. N. da. *A formação de conceitos científicos em crianças de cinco anos fundamentada em mediações sistematizadas*. 2020. 146 f. Tese (Doutorado em Educação) - Universidade Federal de São Carlos, São Carlos, 2020. Disponível em: <https://repositorio.ufscar.br/handle/ufscar/12385>.

VIGOTSKY, L. S. *Obras escogidas*. Tomo II. Problemas de psicología general. 2ª ed. Madri: A. Machado Libros, 2001.

VIGOTSKY, L. S. *Obras escogidas*. Tomo III. Problema del desarrollo de la psique. Madrid: Visor Distribuciones, 1995.

VIGOTSKY, L. S. *Obras Escogidas*. Tomo V. Madrid: Visor Distribuidores, S.A.1997.

VIGOTSKY, L. S. *Obras Escogidas*. Tomo IV. Madrid: Visor Distribuidores, 2006.

VIGOTSKY, L. S. *Pensamiento Y Habla*. Buenos Aires: Colihue, 2007.

Recebido em junho de 2022.
Aprovado em setembro de 2022.