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Scientific thinking in early childhood education: a bibliographic analysis (2018-2023)

ARTICLE

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Abstract
This article presents a bibliographic review investigating Scientific Thinking in Early Childhood Education. The objective of this study is to analyze publications that address Scientific Thinking in Early Childhood Education, approaching a state of knowledge review with a qualitative approach. The theoretical principles guiding the research are theoretical, focusing on interactions, knowledge construction, and the development of scientific thinking. The methodological procedures included a bibliographic review in the Scielo database. The results highlight the importance of integrating science and playfulness into daily school life, promoting the development of scientific thinking from early childhood. In general terms, the reflection presented in this study made it possible to ascertain the importance of interaction, teacher mediation, and the active construction of scientific thinking. Early Childhood Education, in addition to preparing children for the future, contributes to the formation of a more critical and conscious society, capable of facing the challenges of the contemporary world.
Keywords: Scientific Knowledge. Early Childhood Education. Playful Education. Science Teaching.

Pensamento científico na educação infantil: uma análise bibliográfica (2018-2023)

Resumo
O presente artigo oferece uma pesquisa bibliográfica que investiga o Pensamento Científico na Educação Infantil. O objetivo deste estudo é analisar publicações que abordam o Pensamento Científico na Educação Infantil, aproxima-se de um Estado do Conhecimento, com abordagem qualitativa. Os princípios teóricos que orientam a pesquisa foram teóricos, que versam sobre interações, construção do conhecimento e desenvolvimento do pensamento científico. Os procedimentos metodológicos executados incluíram uma revisão de bibliográfica nas bases de dados Scielo. Os resultados destacam a importância de integrar Ciência e ludicidade no cotidiano escolar, promovendo o desenvolvimento do pensamento científico desde a infância. Em termos gerais, a reflexão pautada neste estudo possibilitou constatar a importância da interação, mediação do professor e construção ativa do pensamento científico. A Educação Infantil, além de preparar

as crianças para o futuro, contribui para a formação de uma sociedade mais crítica, consciente, capaz de enfrentar os desafios do mundo contemporâneo.
Palavras-chave: Conhecimento Científico. Educação Infantil. Educação Lúdica. Ensino de Ciências.

1 Introduction

Education plays a transformative role in the lives of individuals and in society, contributing to the expansion of opportunities, the strengthening of intercultural communication, respect for diversity, and the development of critical awareness. In addition, it can contribute to addressing social problems and to building more humanized and supportive coexistence (Charlot, 2021).

According to Sasseron and Carvalho (2011), scientific thinking involves skills such as observing, formulating hypotheses, testing ideas, arguing, and drawing conclusions, actions that allow children to understand phenomena and develop intellectual autonomy. In this context, scientific thinking presents itself as a relevant dimension in educational development, as it promotes understanding of the world, initiative, and decision-making capacity. Thus, its presence in children's educational trajectories can enhance the development of important competencies in a society in constant transformation.

According to Arce, Silva, and Varotto (2011), interest in science may emerge from children's curiosity and sense of wonder, leading them to investigate and discover characteristics of the natural world, as well as to explore elements of technology. Identifying and valuing this curiosity can contribute to the promotion of meaningful learning in the field of Science from Early Childhood Education (Bizzo, 2012).

The exploration of science teaching in the Early Childhood Education stage involves carefully listening to children, creating opportunities for them to experience meaningful activities, and sharing discoveries in the school environment. According to Lorenzetti and Delizoicov (2001), when science teaching is mediated by sensitive listening and by valuing children's experiences, the teacher enables the development of scientific thinking in contextualized situations close to children's daily lives. Teachers who work from

this perspective contribute to the construction of scientific knowledge in a meaningful way, allowing learning to relate directly to reality and to children's lived experiences.

According to Fabiano, Haddad, and Shudo (2024), when Early Childhood Education is offered appropriately, with trained teachers, suitable environments, and proposals coherent with the age group, it has the power to transform children's lives and expand the possibilities for their integral development. In this sense, through learning based on play and interactive experiences, it is possible to foster the development of curiosity, cognitive skills, and the understanding of the world around them.

Early Childhood Education can therefore contribute to strengthening children's self-confidence, autonomy, and critical thinking capacities, establishing foundations for future learning and for comprehensive education (Brasil, 1998). According to Kishimoto (2010), play is a fundamental means for children's cognitive and affective development, because, through play, they explore, create, solve problems, and construct notions that will be essential for more complex learning.

Scientific thinking, as a central concept of this study, refers to the ability to formulate explanations, seek causes, and understand phenomena based on observation and experimentation. According to Bizzo (2012), thinking scientifically does not mean merely mastering specific content, but developing attitudes and forms of reasoning that allow individuals to understand and intervene in reality. Sasseron and Carvalho (2011) emphasize that scientific thinking involves articulated cognitive and linguistic processes, expressed through actions such as observing, arguing, and justifying — skills that can be stimulated from early childhood in playful and exploratory contexts.

The approach of this study is qualitative, of a descriptive nature, as it seeks to analyze, record, and correlate data based on selected materials (Gil, 2010). The adopted design is bibliographic research, based on academic productions available in the Scientific Electronic Library Online (SciELO) database, published between 2018 and 2023.

This text has as its central objective to analyze publications that address Scientific Thinking in Early Childhood Education, in order to understand how this theme has been treated in recent academic literature.

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The initial phase of educational development, known as Early Childhood Education, represents an essential and guaranteed right of children aged 0 to 5 years. In this context, the *Lei de Diretrizes e Bases da Educação* – LDB (Guidelines and Bases for National Education Law) assigns Early Childhood Education a fundamental role in children's integral development, promoting advances in cognitive, emotional, and social aspects, contributing to expanding their perceptions and interactions with the world around them (Brasil, 1996).

Historically, science teaching in Brazil was not widely disseminated until the enactment of LDB no. 4,024/61, which introduced the subject at the lower secondary education level. Subsequently, Law no. 5,692/71 made science teaching compulsory in primary education, adopting a traditional approach that positioned students as recipients of information. Still in the 1960s, innovative proposals based on practical activities emerged, but teachers trained under traditional methods and the guidelines of the military regime hindered the effective implementation of these innovations (Rodrigues, 2016).

Over the years, Brazil consolidated regulatory advances, such as the Federal Constitution of 1988, which recognizes daycare and preschool as stages of basic education, ensuring this right to all citizens. The LDB no. 9,394/96, together with the *Parâmetros Curriculares Nacionais* – PCN (National Curriculum Parameters) and the *Referencial Curricular Nacional para a Educação Infantil* – RCNEI (National Curriculum Framework for Early Childhood Education), contributed to the appreciation of science teaching, integrating it into the "Nature and Society" axis in Early Childhood Education. In the same period, the *Estatuto da Criança e do Adolescente* – ECA (Child and Adolescent Statute) reinforced children's educational rights (Rodrigues, 2016).

In 2017, the *Base Nacional Comum Curricular* – BNCC (National Common Core Curriculum) was established as a guiding document for Basic Education, defining the learning and development rights that must be guaranteed to all Brazilian students. For Early Childhood Education, the inaugural stage of schooling, the BNCC proposes an expanded concept of curriculum, centered on the child as a historical subject, a rights-holder, and the protagonist of their own learning. In this context, the document highlights that pedagogical

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practices should articulate care, education, and play, considering the multiple languages and forms of knowledge that children build through their interactions with the world and their lived experiences.

Thus, advances can be observed in research and educational practices aimed at promoting scientific thinking from daycare and preschool, valuing curiosity, investigation, and experimentation as pathways to children's integral development (Brasil, 2017, 2018).

According to Chassot (2003), it is not possible to develop effective proposals for science teaching without considering the social and personal dimensions of students. For the author, effective proposals are those that promote scientific literacy in a critical and contextualized way, bringing scientific knowledge closer to everyday experiences and to learners' sociocultural reality. In this sense, science teaching should enable students to understand the world in which they live, recognizing science as a human, historical, and transformative construction, rather than merely as a set of ready-made and decontextualized concepts.

For Carvalho (2013), scientific literacy should be understood as a process that involves the development of reasoning, argumentation, and the ability to understand phenomena, going far beyond the simple memorization of concepts. This perspective makes teaching more meaningful and relevant, encouraging students, from early childhood, to engage as active subjects who contribute to a more just and sustainable world.

From a Piagetian perspective, cognitive development occurs through active interaction with the environment, with the child seen as an epistemic subject, capable of constructing knowledge through action. For Piaget (1973), intelligence originates in sensorimotor actions, which are transformed into progressively more complex mental structures through processes such as assimilation and accommodation.

The development of scientific thinking is related to the use of language, but is not limited to it. According to Piaget (1973, p. 92),

> [...] Language, therefore, is a necessary, but not sufficient, condition for the construction of logical operations. […] Between language and thought there is,

> thus, a genetic cycle, in such a way that one of the two terms necessarily relies on the other, in a process of mutual formation and perpetual reciprocal action (Piaget 1973, p. 92).

In this conception, language accompanies intellectual development, but does not determine it. The construction of scientific thinking requires concrete experiences and situations in which children can observe, manipulate, compare, and experiment. By encouraging experimentation and direct action on objects and phenomena, the teacher enables the construction of mental schemes that organize knowledge. Situations involving observation, anticipation, comparison, and classification stimulate children to formulate hypotheses, test ideas, and reorganize their knowledge, which constitutes the process of scientific literacy and marks scientific thinking in its initial form (Sasseron; Carvalho, 2011).

To understand this process, it is pertinent to consider the notion of epistemological obstacle, as proposed by Bachelard (1996, p. 21): “the notion of epistemological obstacle can be studied in the historical development of scientific thought and in educational practice,” which are regarded as the barriers that make the formation of scientific knowledge impossible. These obstacles refer to prior conceptions or intuitions that hinder the understanding of scientific notions. Although Piaget does not use this term directly, his model also recognizes that children’s spontaneous knowledge may conflict with scientific concepts. In this sense, errors and cognitive conflicts are opportunities for the reorganization of mental structures.

In the context of Early Childhood Education, children construct explanations based on their immediate perceptions and sensory experiences, which may generate misconceptions. By creating challenging situations and promoting appropriate mediation, teachers favor the overcoming of these obstacles. Bachelard (1996, p. 21) states that “for the scientific mind, all knowledge is an answer to a question. If there is no question, there can be no scientific knowledge. Nothing is evident. Nothing is free. Everything is constructed.” This view reinforces the value of questioning and reflection in the learning process.

Early Childhood Education, therefore, promotes the development of scientific thinking by providing playful, investigative, and contextualized experiences. By acting upon

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the environment, experimenting, formulating hypotheses, and re-elaborating their ideas, children construct more elaborate knowledge. This process is consistent with the *Campos de Experiências da BNCC* (Fields of Experience of the National Common Core Curriculum – BNCC), which guide pedagogical practices centered on action, discovery, and children's protagonism (Brasil, 2017).

In addition, recent studies indicate several approaches that contribute to the development of scientific thinking in childhood, such as the use of experimentation, literature, technologies, and environmental education practices (Ichiba; Bonzanini, 2022; Costa; Almeida, 2021; Souza *et al.*, 2022; Lichene, 2023; Santana *et al.*, 2021). Such strategies expand learning possibilities and promote children's integral development, respecting their rhythms and ways of knowing the world.

2 Methodology

The present study aims to analyze academic publications that address the development of scientific thinking in Early Childhood Education. This is a qualitative study, with a methodological approach based on the State of Knowledge, grounded in the content analysis proposed by Bardin (2016). The investigation was carried out through a literature review of articles published on the Scientific Electronic Library Online (SciELO) platform, within the time frame from 2018 to 2023.

According to Gil (1999), qualitative research seeks to understand phenomena from their natural contexts, considering the multiple possible interpretations of the subjects and situations involved. From this perspective, the study focuses on understanding the contributions and approaches found in scientific productions regarding scientific thinking in early childhood.

Data collection took place between September and November 2024. Three main descriptors were used as a search strategy, applied in combination in the SciELO database search field: "Scientific Thinking and Early Childhood Education", "Science Teaching and Early Childhood Education", and "Scientific Education and Early Childhood Education". The

time frame (2018–2023) was established with the objective of identifying recent trends and gaps in academic production on the topic.

The first stage of analysis consisted of the pre-selection of articles based on titles and abstracts. When necessary, the full texts were read to verify their relevance to the research object. Box 1 presents the number of articles identified before and after the application of the time frame.

Box 1 – Pre-selection of articles

Search descriptors	Before the time frame	After the time frame
Scientific Thinking and Early Childhood Education	2	1
Science Teaching and Early Childhood Education	23	11
Scientific Education and Early Childhood Education	41	21

Source: Prepared by the authors, based on the collected data (2024).

For the selection of the studies, well-defined inclusion and exclusion criteria were adopted. Only articles published between 2018 and 2023, fully available in the SciELO database, written in Portuguese, and that explicitly addressed the theme of scientific thinking or science teaching in the context of Early Childhood Education were included, preferably linked to formal educational settings such as daycare centers and preschools.

Works were excluded from the research corpus when, although returned in the search results, they dealt exclusively with other levels of education (such as Elementary or Secondary Education), repeated articles across the different descriptors used, as well as those that were not related to the theme.

The next stage consisted of reading the titles and abstracts of the identified articles, with full-text reading carried out whenever necessary to ensure connection with the research topic. In the end, seven articles were selected that met the established criteria and presented a direct relationship with the proposed theme.

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The analysis of the collected data followed the stages proposed by Bardin (2016). In the pre-analysis stage, an initial reading and organization of the material were carried out, allowing for the formulation of first impressions. Then, during the material exploration phase, the coding and grouping of recording units were performed, which allowed the emergence of analytical categories. Finally, in the treatment of results, inference, and interpretation phase, the data were articulated with the theoretical framework, seeking to understand the meanings and significance present in the analyzed studies, as guided by Bardin (2016).

This process made it possible to organize the content into thematic categories: author and year of publication, concepts addressed, methodology developed, teaching resources, the public involved, and foundational authors, which guide the presentation and discussion of the results, contributing to the understanding of trends, challenges, and approaches to scientific thinking in Early Childhood Education over the last five years.

3 Results and Discussion

Box 2 presents a synthesis of the articles selected for analysis, systematized according to the methodological procedures of Content Analysis, as proposed by Bardin (2016). The survey made it possible to identify different approaches to scientific thinking in Early Childhood Education, relating the authors and years of publication, the central concepts addressed, the methods used, the teaching resources employed, the public involved, and the main theoretical references. This structuring enables the visualization of the pedagogical and theoretical practices that support the construction of scientific thinking in childhood, highlighting the role of investigative experiences, playfulness, and teacher mediation.

Box 2 – Search criteria for the analysis of academic articles (2024)

Author/Year	Concepts Addressed	Methodology Developed	Teaching Resources	Target Audience	Foundational Authors
Lichene (2023)	The assessment process; Scientific	Direct observation;	Acrylic tanks; flours (white	29 children in the city of	Dewey (1933, 1938);

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Author/Year	Concepts Addressed	Methodology Developed	Teaching Resources	Target Audience	Foundational Authors
	education in childhood	Interview; Investigative exploration	and yellow); sand; stones; lids (metal, plastic, cork); containers; funnels; strainers; bottles; kit composed of magnifying glass, ruler, notebook, pencil and flashlight	Mallare (Italy)	Bandioli, Savio (2009, 2014, 2015)
Ichiba; Bonzanini (2022)	Vermicomposting for the promotion of Environmental Education	Digital educational game	Game as an assessment tool	Professionals from a municipal school in São Carlos – SP	Soares, Mesquita (2021); Leite (2020); Nunes, Luts (2021)
Costa; Almeida (2021)	School environment: the school we have and the school we want; Playfulness with a STS approach	Conversation circle; playful activity; detective game; projects (drawings)	Paper and colored pencils; detective game	21 students from Jardim II (4 to 5 years old), municipal school in Belém – PA	Santos (2001, 2007, 2012, 2015); Pozo (2012); Lorenzetti (2000)
Santana; Silva; Freitas (2021)	Scientific nature; Project “I want to know! How are butterflies born?”; Scientific experiments	Use of animated series videos (The Luna Show)	Book; photos; project; field diary; record notebook; caterpillar mascot; butterfly garden; bucket	A Pre II class (4 and 5 years old), CMEI in Palmas – TO	Demo (2006, 2010); Silva (2016, 2019, 2020, 2021); Soares (1998, 2003, 2017);
Souza *et al.* (2022)	Actor–Network Theory (ANT)	Workshops; extension project and scientific outreach “University of Children (UC) – UFMG”	Games; modeling clay; giant dolls; magnifying glasses and stethoscopes, among others	Children aged 5 and 6 years, EMEI in Belo Horizonte – MG	Coutinho (2014, 2017, 2019); Latour (1994, 2004, 2006, 2008)
Patriarcha-Graciolli *et al.* (2023)	Children’s Literature for Scientific and Environmental Education	Focus group; Literature review	Dialogue; group interviews; children’s stories; descriptive record sheet	Early Childhood Education teachers, private rural school in Campo	Chassot (2003,2014; Sasseron, Carvalho (2008, 2011); Góes (2010)

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Author/Year	Concepts Addressed	Methodology Developed	Teaching Resources	Target Audience	Foundational Authors
				Grande – MS	
Araújo; Lima; Almeida (2023)	Scientific concepts of science communication for the child audience	Analysis of the work Isaac in the World of Particles, written by Elika Takimoto	Reading; keywords; key ideas; content analysis	Child audience; researchers	Vigotski (2018) Lima; Giordan (2017,2021; Lima; Ramos (2020).

Source: Prepared by the authors, based on the collected data (2024).

When conducting the bibliographic analysis, it was observed that the selected articles present a direct relationship with the investigated theme and share similarities across different analyzed aspects, organized into thematic categories such as concepts addressed, methodologies developed, teaching resources, target audience, and foundational authors. The definition of these categories enabled the construction of interpretative axes consistent with the research objectives, allowing an understanding of how scientific thinking has been addressed in educational practices aimed at children in Early Childhood Education.

Lichene's (2023) research on Scientific Education in Childhood highlights the importance of formative assessment and curiosity as fundamental elements for the development of scientific thinking. The author emphasizes that continuous assessment allows the monitoring of children's progress and the adjustment of pedagogical practices according to their needs. The methodology included observations and recordings of interactions in different contexts with varied interventions. The materials used, such as acrylic tanks, stones, magnifying glasses, and notebooks, stimulated exploration, and each child received an individual kit to foster investigation. The creation of an environment conducive to experimentation, mediated by teachers, reinforced the active construction of knowledge.

Ichiba and Bonzanini (2022) investigated the use of digital games as a tool to promote scientific literacy and environmental education, with a focus on vermicomposting. The study showed that gamification can facilitate the understanding of concepts such as recycling and reuse of organic waste, promoting meaningful and evaluative learning. The

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game “Learning Vermicomposting,” by integrating playfulness and science, allowed children and teachers to interact dynamically, revealing the potential of technology in science teaching.

The study by Costa and Almeida (2021) addressed the integration of playfulness with the *Ciência, Tecnologia e Sociedade* – CTS (Science, Technology and Society – STS) approach in the school environment, showing how observation, reflection, and contact with social and environmental issues contribute to scientific and civic education. Playful activities, such as the detective game and the revitalization of the school space, stimulated children’s active and critical participation. The use of spaces such as gardens and parks strengthened the connection between everyday life and scientific knowledge.

Santana, Silva, and Freitas (2021) analyzed the animated series *The Luna Show* as a strategy for scientific literacy, highlighting curiosity as the driving force of investigation. Through the project “I want to know! How are butterflies born?”, it was possible to develop investigative competencies from early childhood. *Teoria Ator-Rede* (Actor–Network Theory – ANT) grounded the analysis, demonstrating how audiovisual resources and concrete materials (butterfly garden, mascots, etc.) can generate meaningful and practical learning.

The article by Souza *et al.* (2022) criticizes pedagogical practices based on the simple transmission of knowledge and presents the project “Universidade das Crianças” (University of Children) of UFMG as an innovative alternative. Through workshops grounded in Actor–Network Theory, the study documented learning as a dynamic and relational process, centered on sensory interaction with scientific objects and the mediation of meanings. Stethoscopes, magnifying glasses, and games composed the resources used to foster scientific thinking through experimentation and body language.

Patriarcha-Graciolli *et al.* (2023) discuss the use of children’s literature as a strategy for scientific and environmental education. Based on focus groups with Early Childhood Education teachers and a literature review, the study proposed an analytical framework for the selection of literary works that dialogue with scientific themes. Literature is seen as a tool capable of promoting cultural identity, enchantment, and the development of critical thinking from early childhood.

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The article by Araújo, Lima, and Almeida (2023) analyzes the literary work *Isaac in the World of Particles*, by Elika Takimoto, as a teaching resource for the introduction of scientific concepts in accessible language. Using anthropomorphic characters and a historical-cultural approach, the study showed how narrative can promote the understanding of complex ideas through language and social interaction. The work represents an example of how literature can stimulate curiosity and critical thinking in a playful and effective way.

The analysis of the articles reveals that scientific thinking in Early Childhood Education has been explored through multiple approaches and methodologies. The studies demonstrate a variety of approaches that have contributed significantly to the researched theme, revealing a promising path to cultivate curiosity and scientific knowledge in children. These practices enrich the educational environment and prepare students to be critical and conscious citizens, capable of understanding and interacting with the world around them.

The research by Lichene (2023) and the study by Santana, Silva, and Freitas (2021) emphasize curiosity as a central element in the development of scientific thinking. Lichene (2023) highlights formative assessment as fundamental for documenting students' development and adjusting pedagogical practices, while Santana, Silva, and Freitas (2021) show how animations stimulate curiosity and critical thinking, promoting playful learning.

Ichiba and Bonzanini (2022) and Souza *et al.* (2022) explore technology as an educational tool. Ichiba and Bonzanini (2022) demonstrate how digital games can facilitate scientific literacy and environmental education, while Souza *et al.* (2022) use audiovisual records to promote active interaction and knowledge construction through the **"Universidade das Crianças" (University of Children)** project of **UFMG (Federal University of Minas Gerais)**.

It is worth noting that Costa and Almeida (2021) and Araújo, Lima, and Almeida (2023) explore the integration of playfulness and the Science, Technology and Society – STS approach, highlighting the importance of connecting science with social and environmental issues. These practices encourage children's active participation, promoting citizenship and critical thinking, also corroborating the ideas of Ichiba and Bonzanini (2022)

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and Souza *et al.* (2022), who likewise emphasize the relevance of interactive methodologies for engagement and meaningful learning.

Patriarcha-Graciolli *et al.* (2023) and Araújo, Lima, and Almeida (2023) highlight children's literature as an effective means of introducing scientific concepts in an accessible way. These studies show how literary narratives can stimulate curiosity and critical thinking, promoting a scientific culture from an early age.

The studies address similar age groups, focusing mainly on children in Early Childhood Education. Even those that used only documentary analysis show that they are specific to this age group. However, the educational contexts vary, with some research conducted in formal school environments, while others take place in alternative contexts, such as workshops and extracurricular projects.

In summary, the analyzed data show that scientific thinking in Early Childhood Education has been addressed as an object of study in a multifaceted way, reflecting different ways of understanding and promoting science teaching in childhood. These multiple facets are manifested in the methodological strategies, theoretical conceptions, and teaching resources mobilized by researchers, reflecting the complexity and richness of the investigative field. The analyzed articles present diverse methodologies and theories that highlight the importance of integrating science and playfulness into everyday school life. This diversity of perspectives enriches the understanding of the theme and points to the need for innovative pedagogical practices that promote children's critical and investigative development through science teaching in childhood.

4 Final considerations

The analysis of Scientific Thinking in Early Childhood Education, carried out through a literature review of publications between 2018 and 2023, made it possible to achieve the central objective of this study: to analyze publications that address Scientific Thinking in Early Childhood Education, in order to understand how this theme has been treated in recent academic literature. Based on this objective, it was possible to identify a

growing appreciation of children's curiosity and exploration as essential pillars for children's integral development.

The analyzed studies reveal that Early Childhood Education should be understood as a space for meaningful experiences, in which playing, experimenting, and interacting constitute the foundation of learning, a living environment where active listening, pedagogical mediation, and scientific investigation are encouraged from an early age. Methodologies that include digital games, animations, children's literature, and playful practices demonstrate that the integration of different approaches expands children's possibilities of expression and reasoning, strengthening cognitive, critical, creative, and reflective skills.

It also becomes evident the importance of teachers' continuing education and the adequacy of school spaces, which are fundamental factors to ensure pedagogical practices that dialogue with children's interests and needs. The use of audiovisual and interactive resources, such as games and videos, has proven effective in bringing children closer to complex scientific concepts, making them more accessible and meaningful.

Thus, returning to the proposed objective made it possible to perceive that promoting Scientific Thinking in childhood requires pedagogical intentionality, sensitivity to children's expressions, and a commitment to building a critical and transformative education. Investing in Early Childhood Education from this perspective contributes to the formation of conscious citizens, capable of observing, arguing, and understanding the world in an increasingly aware and responsible way.

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