Narrative and Mathematics: A Dialogic Analysis of Children's Stories in the Understanding of Classification, Serialization and Comparison

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Abstract

The study analysed the role of children's stories as cognitive mediators in the construction of logical thinking in early education. It was based on the premise that stories, by integrating language, emotion and experience, enable symbolic understanding and the organisation of reasoning. This research responded to the need to establish a theoretical framework that links children's literature with early mathematical learning processes. The objective was to identify how children's narratives affect the development of classification, seriation and comparison skills in early childhood, interpreting the results from a hermeneutic and bibliometric approach. The study was developed with a qualitative approach, using a documentary and interpretative design. A total of 392 articles indexed in Scopus were analysed using VOSviewer, and semi-structured interviews were conducted with 30 teachers from the National University of Education (UNAE). The data were triangulated in Atlas.ti version 25 software, generating three emerging categories: narrative mediation, cognitive interaction and discursive comprehension. The findings showed that narrative acted as symbolic mediation between experience and abstraction. The sequences of the story promoted attention, memory, and inductive reasoning. The teaching discourse, by guiding the interpretation of the stories, consolidated the understanding of basic mathematical concepts within a linguistic and cultural framework. Children's narrative was consolidated as an epistemic system that unites cognition, discourse and culture. The story not only stimulates the imagination, but also organizes the logic of children's thinking, demonstrating its effectiveness as a pedagogical tool in early education.

Keywords: early childhood education, children's literature, cognition, hermeneutics, logical thinking

1. Introduction

In recent decades, early childhood mathematics education has taken on a decisive role in academic and political debates on a global scale. Various countries have implemented innovative strategies to link mathematics teaching with artistic, literary and narrative languages, which has allowed logic to be integrated with imagination (Ben-Zvi et al., 2025). European education systems have developed learning models based on illustrated stories, school theatre and digital resources that combine mathematical thinking and storytelling (Gardner-Neblett, 2024). These experiences show that children's stories can be effective vehicles for teaching concepts such as classification, seriation and comparison, by connecting mathematical symbols with everyday contexts that are accessible to children (Moreno-Núñez et al., 2025). At the same time, Asian countries have strengthened early education with multimodal storytelling programmes in which voice, image and gesture mediate between literary discourse and logical reasoning.

The international trend suggests that narrative is no longer an auxiliary resource but has become a strategic component of early mathematics curricula (Savaş et al., 2024).

In Latin America, the situation is known to vary. Countries such as Chile, Mexico and Colombia have incorporated narrative methodologies to enhance mathematical understanding at the preschool level (Weder & Stranzl, 2025). Programmes that integrate children's literature with counting and sequencing activities have shown progress in student motivation and the development of cognitive skills linked to logical reasoning. However, persistent inequalities in implementation have also been noted, stemming from institutional limitations, a lack of teaching resources and shortcomings in teacher training (Albano et al., 2022). Recent research highlights that narrative is a teaching strategy with great potential, but it is still marginal compared to other traditional approaches focused exclusively on repetition exercises (Pinto & Koichu, 2023). These comparisons show that the problem transcends national borders and responds to regional dynamics where progress and backwardness coexist.

In the Ecuadorian context, significant gaps are revealed. Early childhood education programmes recognise the importance of narrative, but its integration with mathematics teaching is in its infancy. In pedagogical practice, fragmented models persist that separate logic from creativity, making it difficult for children to construct comprehensive meanings. The absence of systematic research linking children's stories and logical reasoning has left this field largely unexplored in the country.

Institutions such as the National University of Education (UNAE), where teachers are trained in community and family processes, do not have studies that analyse how stories can mediate mathematical learning in early childhood. This gap poses risks: if not corrected, training programmes could continue to transmit practices that are disconnected from children's reality, reproducing difficulties in understanding basic notions such as classification or seriation. The local research gap justifies the need for in-depth and rigorous investigation of this problem.

In this scenario, the central question of the research arises:

How do the narrative structures of children's stories, interpreted from Bakhtin's dialogic theory, mediate the understanding of basic mathematical concepts in early education?

The formulation of this question summarises the problematic situation and guides the proposed methodological strategy. The aim is not only to describe isolated experiences, but also to construct a theoretical framework that allows us to understand the discursive processes that connect literature and mathematics in early childhood.

Based on this question, the general objective was established to analyse, from Bakhtin's dialogic theory, how the narrative structures of children's stories mediate the understanding of the concepts of classification, seriation and comparison, identifying the discursive elements that act as cognitive bridges. This approach responds to the challenge of producing integrative knowledge, capable of dialoguing with international trends, adapting to the Latin American context and addressing local issues.

To address this objective, two hypotheses were formulated:

The null hypothesis H_0 states that there is no significant relationship between the use of children's stories and the understanding of the concepts of classification, seriation and comparison in early education.

The alternative hypothesis H_1 maintains that children's narratives do mediate these comprehension processes in a positive and significant way by generating dialogic interactions that facilitate cognitive construction and logical learning in young children.

2. Literature Review

2.1 Dialogic Theory of Bajtín

Dialogic theory is based on the premise that every statement arises in relation to another and is constructed through the interaction of multiple voices (Ebby et al., 2024). From this perspective, discourse is not understood as an individual product, but rather as the result of a network of shared meanings that are constantly being negotiated. Language, then, becomes a space where diverse intentions and social contexts converge to give meaning to communication. In the field of education, this dialogical conception has led to the understanding that learning does not occur in isolation, but rather within a network of discursive relationships where students' appropriate meanings and construct new knowledge (Sotardi, 2024). Children's stories, being composed of narrative voices, characters, and symbolic contexts, represent fertile ground for applying the Bakhtinian approach. By listening to and recreating these stories, children meet discourses that challenge them, question them, and lead them to compare, classify, or relate narrative elements that are indirectly linked to the logical processes of early mathematics (Vaidya & Battey, 2022).

The need to apply this theory in the present study is justified because it allows us to identify in children's stories those discursive fragments that mediate the understanding of early cognitive operations. In this way, the analysis is not reduced to the surface structure of history (Abril-López et al., 2021). The analysis delves into the network of meanings that children elaborate in dialogue. These are characterized between text, teaching voice and everyday experience. Without this approach, the analysis would be limited to a descriptive plane and would not capture the dialogical richness of the educational process. In addition, dialogic theory opens an interpretive framework that links naturally with research that has explored the relationship between language, narrative, and cognitive development. At this point, it is pertinent to move towards Vygotsky's sociocultural theory, since both perspectives share the idea of knowledge as a social construction situated in interaction (Voigt et al., 2023).

2.2 Vygotsky's Sociocultural Theory

Sociocultural theory posited that learning originates first on a social level and is then internalised on an individual level (Lambert et al., 2022). This approach transformed the way cognitive processes were understood, considering cultural mediation and interaction with others to be essential conditions for skill development. The notion of the zone of proximal development became a central concept, describing how students advance in their learning with the guidance and support of a more experienced mediator (Gaylo, 2025).

In the case of early childhood education, this perspective highlighted the role of the teacher as a mediator who introduces children to meaningful cultural practices (Planas & Pimm, 2024). Children's stories, understood as cultural products, offer a privileged means for children to interact with symbols, analogies, and representations of the world that stimulate the construction of logical notions. Recent research has pointed out that shared reading and discussion of stories allow children to develop seriation and comparison skills, thanks to the teacher's guidance and the cultural context provided by the narrative.

The need to include this theory in the study stems from the fact that it offers a clear explanation of how narrative processes become cultural mediations for mathematical learning (Nieminen et al., 2024). The interaction between teacher, student and children's story configures a space where logic is not taught as an abstract set of rules. These become a living dialogue that emerges from culturally significant situations. This contribution connects directly with the methodological intention of conducting interviews with teachers, since it allows analyzing their practices as agents of mediation in the construction of logical learning through literature. In addition, sociocultural theory offers a methodological bridge with dialogic theory, emphasizing that the meaning of learning lies in the interaction between voices (Andrade-Molina, 2021). This articulation opens the way to a third necessary perspective: narrative theory in contemporary mathematics education, which has consolidated in recent years a body of studies applied to the school context.

2.3 Narrative Theory in Contemporary Mathematics Education

Narrative theory applied to mathematics education maintains that stories enable the structuring of learning experiences in which students understand abstract concepts through symbolic sequences and characters that represent cognitive operations (Albano et al., 2022; Planas & Pimm, 2024). Narrative acts not only as a teaching resource, but also as an epistemological framework that organises thought into temporal and logical structures. Recent research has documented how storytelling linked to mathematical situations promotes understanding of processes such as classification and comparison by allowing students to draw analogies between the plot of the story and the logical operations they must solve (Marini et al., 2025; Unlu et al., 2025). These findings reinforce the idea that narrative constitutes a bridge between concrete and abstract thinking, especially in the early stages of cognitive development.

The inclusion of this theory in the present study was justified because it offers a specific conceptual framework for analysing how teachers integrate children's stories with the teaching of basic mathematical concepts (Chronaki et al., 2022). The literature review showed that, in international contexts, narrative theory has been applied with encouraging results, while in Latin America progress has been limited and fragmented. The truth is that this reflects a need for research that connects the global perspective with local challenges, providing empirical evidence that allows for consolidating the approach in countries such as Ecuador (Morphett et al., 2025). This theory complements the previous two by providing a methodological framework that guides the construction of categories in hermeneutic analysis with Atlas. Ti. In this way, the study is not limited to describing the presence of stories in the classroom, but analyses their structures, functions and effects on children's logical understanding. The link between narrative and mathematics, based on dialogue and sociocultural theory, acquires here an applied framework that gives coherence to the research (Blandino, 2025).

2.4 Final Connection of the Three Theories

The review of these three perspectives showed that the learning of basic mathematical concepts in early education cannot be understood as an isolated or exclusively cognitive process. On the contrary, it is an experience situated within a network of discourses, cultural practices and narratives that mediate the construction of knowledge. Bajtín's dialogic theory provided an understanding of stories as spaces for interaction between multiple voices. Vygotsky's sociocultural theory explained how this interaction becomes cultural mediation that drives cognitive development. Narrative theory in contemporary mathematics education provided an applied framework for interpreting how stories facilitate the understanding of specific logical notions (Kunju et al., 2025; Unlu et al., 2025). The literature review shows that the convergence of these three theories constitutes the most pertinent theoretical foundation to answer the research question. In addition, it reinforces the need to apply a bibliometric, documentary and hermeneutical analysis that allows visualizing how children's narrative mediates the understanding of classification, seriation and comparison in early education.

3. Method

3.1 Research Approach

The study was conducted using a qualitative approach. The qualitative approach seeks to interpret reality based on the perceptions and meanings of social actors (Mendoza et al., 2023). This approach allowed us to understand the discursive and symbolic processes that emerged between narrative and logical reasoning in early childhood education. It was chosen because it offers the possibility of analysing educational phenomena in their natural complexity, without manipulating variables and considering the subjectivity of the participants. The qualitative nature of the study made it possible to link documentary and bibliometric information and teachers' testimonies in a hermeneutic reading that gave rise to interpretative categories consistent with Bakhtin's dialogic theory.

3.2 Type of Study

The study adopted an interpretative, bibliometric and documentary-hermeneutic design (Pari et al., 2020). The interpretative approach allowed meanings to be reconstructed from the perspective of teachers and scientific texts. The bibliometric analysis provided a qualitative-descriptive overview of recent production on narrative, childhood and mathematics. For its part, the hermeneutic phase integrated empirical and documentary information through coding in Atlas.Ti version 25, which made it possible to identify relationships between discourse, pedagogical practice and logical understanding (Cejas et al., 2024). Complementarily, the ethnomethodological component favoured the examination of teachers' actual discursive practices in their university guidance context.

3.3 Phase 1 – Collection of Bibliographic Data

The first phase consisted of searching and purging documents in the Scopus database. The advanced data search formula was applied (1):

(TITLE-ABS-KEY ("children's literature" OR "children's stories" OR "fairy tales" OR "storytelling" OR "narrative") AND TITLE-ABS-KEY ("mathematics education" OR "early mathematics" OR "early numeracy" OR "logical reasoning" OR "cognitive skills" OR "classification" OR "seriation" OR "comparison") AND TITLE-ABS-KEY ("dialogic" OR "Bakhtin" OR "discourse" OR "mediation" OR "hermeneutic")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ARTS") OR LIMIT-TO (SUBJAREA , "PSYC") OR LIMIT-TO (SUBJAREA , "MATH")) AND (LIMIT-TO (PUBYEAR , 2025) OR … 2020) AND (LIMIT-TO (LANGUAGE , "English")) (1)

This search yielded 392 articles. The screening process considered the following criteria: less than five years old, thematic relevance to early childhood education, conceptual consistency with the study objective, and availability of complete metadata. Duplicate publications or those from fields outside the education sciences were discarded. This selection ensured the validity of the sources and their correspondence with the fields of 'society, arts and humanities, psychology, and mathematics.' Each record was exported in CSV format (Full Record + Cited References), generating the database that fed into the subsequent phases.

3.4 Phase 2 – Bibliometric Analysis

In the second phase, VOSviewer software was applied, using the CSV database derived from the Scopus Elsevier database (Pinos et al., 2023). Keyword co-occurrence maps were constructed to identify dominant terms and their semantic grouping. The results provided a structural overview of the field, highlighting the convergence between language, literature and logical thinking. The bibliometric procedure lent objectivity to the qualitative study and

served as the basis for selecting the most cited and relevant articles that formed part of the final interpretation.

3.5 Phase 3 – Semi-Structured Interviews

The third phase involved obtaining testimonies from teachers. A guide was drawn up with five open questions aimed at exploring the relationship between narrative and logical comprehension:

How did teachers describe the integration of children's stories in their early math classes?

What narrative strategies were considered most effective for classifying, serializing, and comparing?

How did the dialogic interaction between teacher and student influence the understanding of logical concepts?

What institutional or pedagogical limitations made it difficult to apply narratives in the classroom?

How did teachers perceive the contribution of children's literature to the development of logical-mathematical thinking?

The interviews were conducted with 30 teachers from the Early Childhood Education programme at the National University of Education (UNAE). The interviews were conducted using the Zoom videoconferencing software system. The sample was intentionally totalitarian, as it included all active teachers in the online modality. All participants had fourth-level training and more than five years of experience in higher education. The conversations were audio recorded, with express authorisation, and transcribed using the Microsoft 365 Copilot system. The institutional ethics committee approved the process and guaranteed confidentiality using codes EI.1 to EI.30 (Hinostroza et al., 2025).

3.6 Phase 4 – Hermeneutical Analysis and Triangulation

In the fourth phase, all sources (392 articles, VOSviewer maps, and teacher interviews) were integrated into Atlas.Ti version 25 software. A hermeneutic content analysis was applied, coding significant segments of text, quotes, and emerging categories. Triangulation combined three dimensions: discursive (scientific texts), visual (bibliometric maps) and experiential (interviews). This process generated a structural network consisting of three main categories, each with two subcategories and two analytical areas, which were articulated in a theoretical approach that responded to the alternative hypothesis proposed.

The analysis allowed us to verify correspondences between bibliometric findings and teachers' perceptions, highlighting narrative mediation in the understanding of classification, seriation, and comparison. The entire procedure followed COPE standards and ethical norms for qualitative research (Martínez et al., 2021). Information confidentiality was maintained; testimonies were identified with codes EI.1 to EI.30 without including names or personal data.

3.7 Techniques and Instruments

The techniques used were bibliometric review, document analysis, and semi-structured interviews. The instruments included:

- VOSviewer, for the exploration and visualisation of scientific networks.
- Semi-structured interview guide, with flexible questions that allowed the conversation to be adapted according to the teacher's response.
- Atlas.Ti v25, for coding, triangulation, and the construction of hermeneutic categories.

Each instrument was validated through expert review (UNAE ethics committee) and pilot testing with two teachers, ensuring clarity and relevance. The combined use of software and manual techniques reinforced interpretive reliability.

3.8 Results Analysis Technique

The information processing followed a sequential process of four stages (see Figure 1):

- Document classification: organization of the 392 articles by year, country and keywords.
- Bibliometric representation: generation of co-occurrence networks in VOSviewer.
- Discursive interpretation: hermeneutic reading of bibliographic data and teaching testimonies.
- Integrated Triangulation: Contrast Between Literature, Maps, and Interviews in Atlas.Ti.

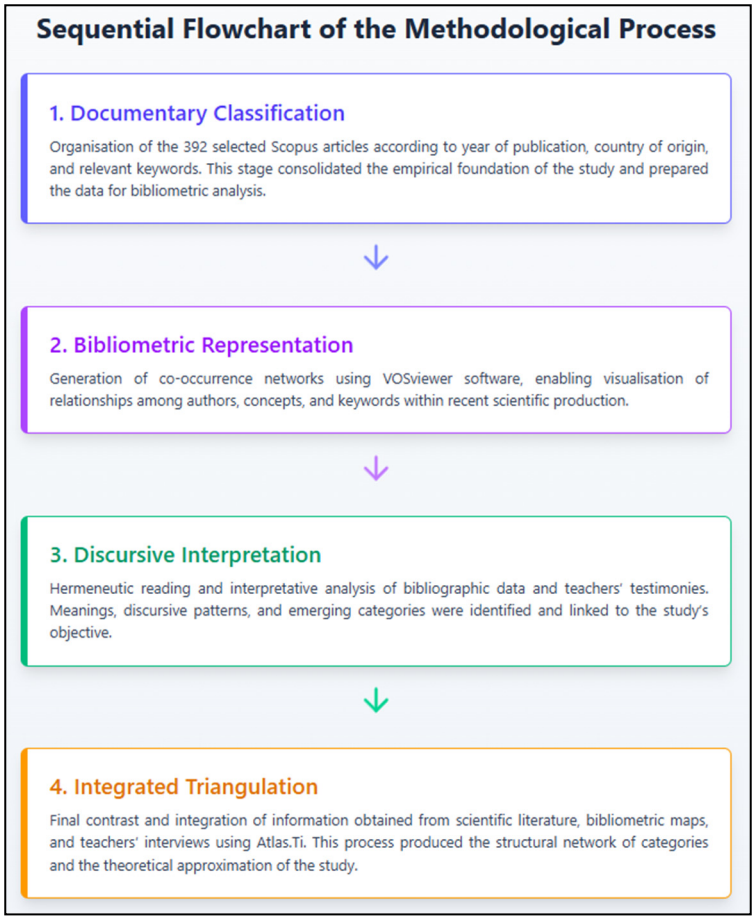

Figure 1. Methodological Phases of the Qualitative-Bibliometric Study

The diagram illustrates the four sequential stages of the research process: documentary classification, bibliometric representation, discursive interpretation, and integrated triangulation. Each phase demonstrates the flow of data from collection to theoretical synthesis using VOSviewer and Atlas.Ti software. The final analysis led to the generation of categories that explained how narrative structures mediate the understanding of logical concepts in early education. This method guaranteed interpretative validity, procedural transparency and fidelity to the participating voices.

4. Results

4.1 Integrated Bibliometric Analysis of Co-Occurrences (VOSviewer)

The bibliometric analysis was conducted on a basis of 392 articles indexed in Scopus between 2020 and 2025, obtained using the advanced formula detailed above. The review identified contemporary trends linking studies on children's narrative, logical thinking, and cognitive mediation in early childhood education. Processing the data in CSV format (Full Record + Cited References) enabled the generation of various maps in the VOSviewer software, which revealed relationships between terms, disciplinary areas, and areas of scientific production. In contrast to fragmented approaches, a unified network configuration was chosen, capable of condensing the most stable semantic nuclei in the field and offering a structural reading of the dialogue between narrative, cognition and early childhood education (see figure 2).

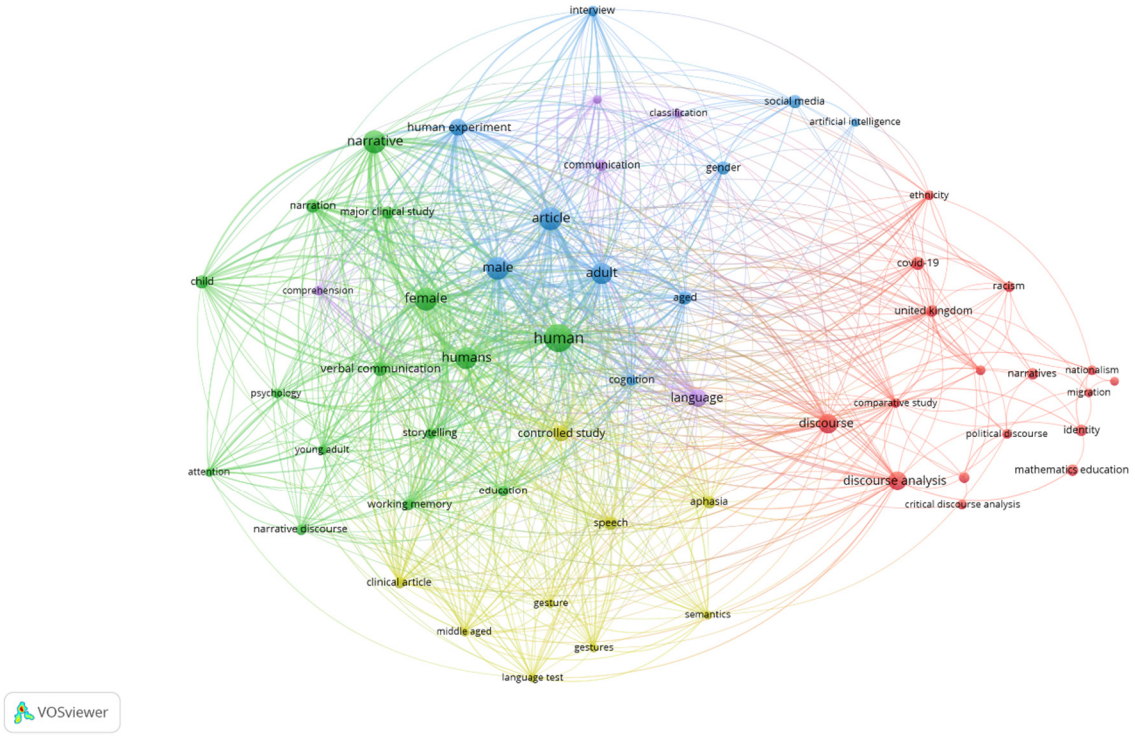

Figure 2. General Network of Co-Occurrences on Narrative, Discourse and Cognition (VOSviewer)

The integrated network showed a hierarchical polycentric architecture, in which the term narrative occupied a clearly dominant position. This node concentrated the largest number of links and the greatest co-occurrence strength, confirming its role as the epistemological axis of the field, around which the main theoretical and empirical constructs gravitated. This centrality was not accidental. It reflected a consolidated trend in recent scientific production, where narrative ceased to appear as an accessory resource and began to operate as a cognitive structure organising early learning, as has been pointed out in contemporary studies on mathematics education and pedagogical discourse.

Three main semantic communities were articulated around this core. The first, which was the densest, grouped terms such as child, storytelling, comprehension, attention, and working memory. Its configuration revealed a predominant orientation towards early cognitive processes, with an emphasis on sustained attention, sequential memory, and symbolic comprehension. The semantic proximity between these terms indicated that narrative was treated in the literature as a device that structures children's cognitive experience through meaningful sequences and order relations, consistent with recent research on narrative mediation and logical development.

A second cluster comprised terms linked to the empirical and methodological dimension, such as human, adult, female, male, article, and controlled study. This set reflected the experimental and observational basis that underpins the field, especially in research with human samples in formal educational contexts. Its direct connection to the narrative node suggested that the study of narrative was consistently supported by empirical designs applied to real teaching and learning contexts, which reinforced the external validity of the narrative approach in early childhood education, as documented in recent comparative and educational studies.

The third semantic community, less dense but conceptually significant, was organised around terms such as discourse, identity, migration, ethnicity, and mathematics education. Its presence indicated an expansion of the field towards sociocultural and critical approaches, where narrative was approached as a situated discursive practice. This semantic shift showed that narrative analysis began to incorporate dimensions of identity, cultural diversity, and language as a social practice, especially in educational contexts marked by linguistic and cultural heterogeneity. Recent research has pointed to this same theoretical inflection, sitting narrative discourse as a space for the construction of collective meaning and not just individual meaning.

Across the board, nodes such as language, semantics and gesture acted as bridges between cognitive, empirical and

sociocultural communities. Their connecting function demonstrated a multimodal understanding of learning, where meaning was constructed through the interaction between words, body language and symbolic experience. This configuration supported recent approaches that interpret early learning as an embodied process, mediated by language and action, rather than as a simple acquisition of formal content.

The integrated network revealed a theoretically mature field, with a solid narrative core and clearly interrelated cognitive, discursive, and sociocultural ramifications. The decision to condense the analysis into a single figure allowed for a more accurate and coherent reading of these relationships, avoiding visual repetitions and strengthening theoretical interpretation. Bibliometric evidence supported the narrative's role as an epistemological system articulating cognition, language and culture in contemporary early childhood education, providing a consistent framework for the hermeneutic interpretation developed in the following sections.

4.2 Hermeneutic Analysis of Categories (Atlas.ti v25)

The hermeneutic analysis developed in Atlas.ti (version 25) integrated information from interviews with thirty teachers from the Early Childhood Education programme at the National University of Education (UNAE). Each testimony was coded under the nomenclature EI.1–EI.30, ensuring the confidentiality and traceability of the units of meaning. From the open and axial coding process, three structural categories emerged: Narrative Mediation, Cognitive Interaction, and Discursive Comprehension. These categories, supported by triangulation with bibliometric results, highlighted the ways in which children's narratives mediate the understanding of basic logical processes—classification, seriation, and comparison—from a dialogical and educational perspective.

4.2.1 Category 1: Narrative Mediation

The Narrative Mediation category grouped together the codes Story as a cognitive mediator, Dialogic narrative, Symbolic comprehension and Transfer of meanings (see figure 3). The testimonies of EI.3 and EI.6 highlighted that the children's story allowed the children to ‘organise ideas and classify elements naturally’, which gave rise to the code story as a cognitive mediator. In turn, EI.12 and EI.18 emphasised that narrative dialogue encouraged comparison and sequencing during reading, consolidating dialogic narrative as a discursive space for collective construction.

The codes symbolic comprehension and transfer of meanings were derived from statements by EI.5, EI.14, and EI.23, who pointed out that children applied what they learned from the story in other contexts, demonstrating a transfer of meanings. This dynamic confirmed that children's narrative functioned as a mediator between concrete thinking and symbolic comprehension. The structural network showed an ascending relationship: narration acts as the starting point for cognitive mediation, dialogue enables interpretative interaction, and the transfer of meanings reflects the consolidation of learning. Taken together, the results showed that narrative mediation constituted the axis of transition between the aesthetic experience of the story and the formation of early logical thinking.

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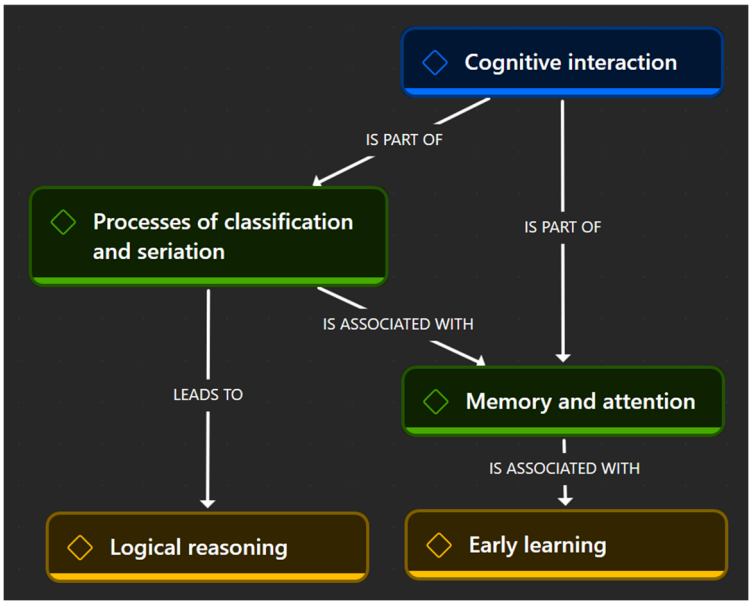

Figure 3. Category 1: Narrative Mediation

4.2.2 Category 2: Cognitive Interaction

The Cognitive interaction category grouped the codes Processes of classification and seriation, Memory and attention, Logical reasoning and Early learning, which reflected the cognitive mechanisms involved in mental organization and initial learning (see Figure 4). During the coding process, it was identified that narrative stories and activities favored the activation of cognitive strategies linked to memory and sustained attention. According to EI.7 and EI.11, "children remember the order of the characters or objects in the story and then manage to classify them by size or function." This type of statement allowed the generation of the code Processes of classification and seriation, associated with the development of hierarchical mental structures and the organization of symbolic stimuli.

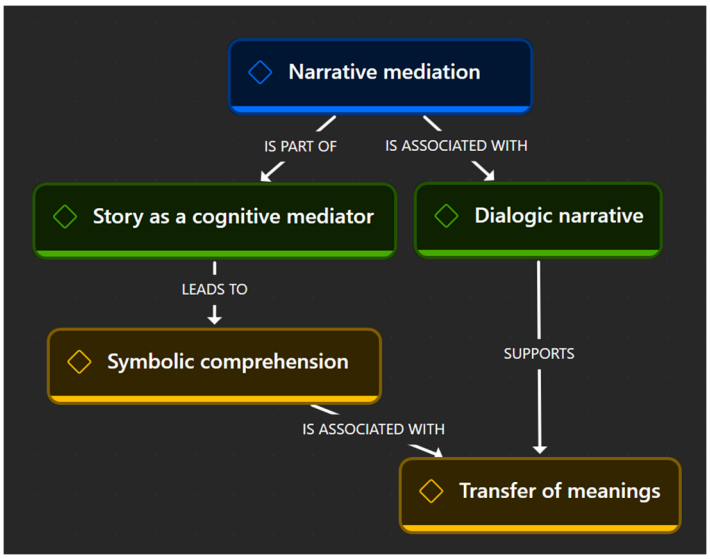

Figure 4. Structural Network: "Cognitive interaction"

Similarly, EI.9 and EI.16 noted that ‘when stories are repeated or have clear sequences, children anticipate what comes next and concentrate more.’ These descriptions gave rise to the code Memory and attention, which showed how narrative mediation not only stimulates attention but also reinforces working memory and the ability to anticipate, essential elements of early cognitive processing. For their part, EI.4, EI.10, and EI.14 agreed that ‘children begin to justify why an object belongs to a group or how it should be ordered,’ which led to the code Logical reasoning. This sub-dimension reflected the transition from perceptual thinking to relational thinking, showing that narrative stories act as scaffolding that promotes inductive and deductive reasoning based on concrete symbolic experiences.

Similarly, the testimonies of EI.2 and EI.13 showed that these skills are consolidated in the early years of learning, generating the sub-dimension Early learning, understood as the moment when the child begins to integrate logic with narrative experience. The structural network allowed us to observe how Processes of classification and seriation are linked to Logical reasoning through a flow that starts with attention and culminates in rational understanding. The interaction between memory and attention and early learning reinforced the idea that initial cognitive processes develop interdependently. Attention functions as a sensory entry point, while memory maintains narrative information, allowing for comparison, inference, and conceptual organisation. This cognitive sequence demonstrated the progression from perceptual recognition to logical reasoning.

Cognitive interaction formed a functional framework that articulates the processes of attention, memory, and reasoning within early childhood learning. Narrative operated as a symbolic mediator that activates hierarchical cognitive schemas and promotes the structuring of logical thinking. The findings revealed a direct connection between exposure to stories, the consolidation of sequential memory, and the ability to classify, thus configuring a key dimension in the development of structured thinking during early childhood.

4.2.3 Category 3: Discursive Comprehension

The category Discursive understanding synthesised the processes through which language, as a cognitive and social structure, enabled the construction of meaning and the emergence of mathematical thinking in narrative contexts (see

figure 5). The most representative codes were Hermeneutic analysis of discourse, Language as an epistemic bridge, Semantic construction and Mathematical thinking, forming a conceptual network that shows how discursive interpretation sustains higher cognitive development in childhood. During the interview process, EI.5 and EI.12 stated that "the children begin to explain what they understand about the story and to give their own reasons," which generated the code Hermeneutic analysis of discourse. This component reflected the interpretative capacity of the infant when facing a story, where he not only reproduces information, but also reconfigures it from his own symbolic experience. Discourse comprehension was thus consolidated as an active process of interpretation, linked to the use of language as a tool of mediation.

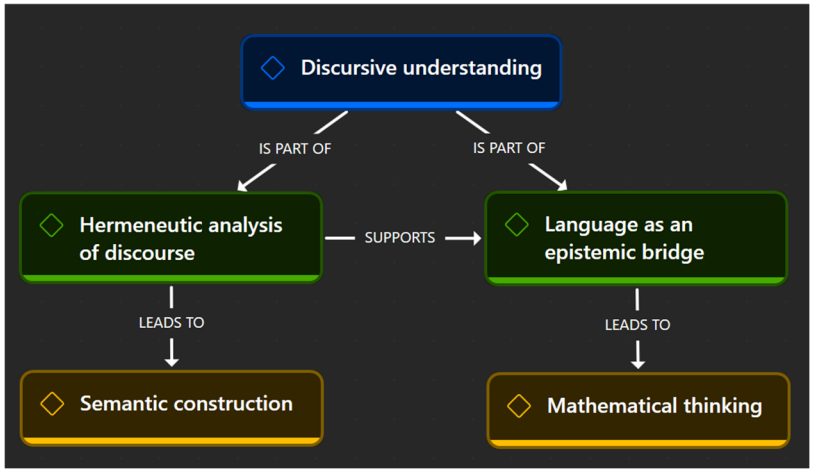

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Figure 5. Structural Network: “Discursive understanding and epistemic bridges”

On the other hand, EI.8, EI.10, and EI.15 mentioned that ‘when language is used to compare, measure, or describe relationships, children begin to think differently.’ These statements led to the code Language as an epistemic bridge, understood as the function of language in the construction of abstract knowledge. In this sense, language acted as a bridge between narrative and logical cognition, favouring the transition from symbolic interpretation to the formulation of conceptual structures that underpin analytical thinking. The sub-dimension Semantic construction emerged from the recognition that discursive comprehension is not limited to the linguistic level but involves the semantic organisation of thought. According to EI.2 and EI.9, ‘children give meaning to what they read or hear and then apply it to new situations.’ This testimony evidenced the progression from the interpretation of meanings to their transfer and cognitive reconstruction, where the child reconfigures what they have learned from dialogue and narrative experience.

The codes associated with mathematical thinking showed the consolidation of a type of abstract thinking derived from discursive comprehension. EI.3 and EI.11 indicated that ‘children use the words in the story to narrate, order or resolve situations,’ demonstrating how linguistic mediation generates mental structures that support numerical reasoning. By incorporating sequences, comparisons and relationships, narrative becomes a tool that cognitively prepares students for logical-mathematical thinking. On a relational level, the structural network revealed a direct connection between Hermeneutic analysis of discourse and Language as an epistemic bridge, showing that discourse interpretation is not an end, but a means for developing conceptual structures. In turn, both dimensions led to Semantic construction and Mathematical thinking, revealing a continuum of understanding that advances from the interpretive to the abstract.

The category Discursive understanding represented the most elaborate level of narrative cognitive processing. Similarly, it was demonstrated that language, when understood as an epistemic mediator, drives the child's ability to construct meaning. It also allows for the analysis of relationships and the development of logical thinking. In this way, discourse was consolidated as the articulating axis between symbolic understanding, verbal cognition, and the emergence of mathematical reasoning, constituting a central dimension in the configuration of children's learning.

5. Discussion

5.1 General Interpretation of the Findings

The findings showed strong consistency between the three levels of analysis developed: bibliometric, discursive, and hermeneutic. This convergence allowed us to argue that children's narratives operated as cognitive and linguistic mediators in early education, articulating thought, language, and social experience within the same interpretive framework. This behaviour was consistent with recent research that has positioned narrative as an epistemic structure capable of organising early cognitive processes in diverse educational contexts, both in European and Latin American settings (Martínez-García et al., 2023).

The co-occurrence network showed that the term narrative occupied a dominant structural position, recurringly connecting with language, discourse, education, and working memory. This semantic centrality was not limited to an abstract global trend. Studies conducted in Latin American contexts showed similar patterns, where narrative was described as an organising axis of logical learning in childhood, especially in classrooms marked by cultural and linguistic diversity. The coincidence between the bibliometric results and the teachers' testimonies reinforced the interpretation of narrative as a device that sustained attention, promoted symbolic understanding and generated emotional involvement in learning (Pastoriza-Domínguez et al., 2022; Unlu et al., 2025).

5.2 Cognitive Dimension

The cognitive dimension revealed a direct correspondence between narrative processes and the basic mental operations of classification, seriation, and comparison (Xu & Mesiti, 2022). In the Atlas.ti software analyses, the categories ‘classification processes’ and ‘memory and attention’ showed greater semantic density, reflecting the shared perception that children's stories helped to structure logical thinking. Several teachers (EI.4, EI.9, EI.11) pointed out that storytelling allowed mathematical concepts to be linked to everyday situations, which led to more lasting learning. Cognitive analysis revealed a direct correspondence between narrative processes and the mental operations of classification, seriation, and comparison.

The categories with the highest semantic density—classification and memory-attention processes—confirmed that children's stories contributed to structuring logical reasoning from meaningful experiences. This pattern coincided with studies conducted in Latin American classrooms, where narrative allowed mathematical concepts to be linked to everyday situations familiar to children, promoting a more stable and contextualised understanding (Debreslioska et al., 2025). Recent research in rural and urban contexts in Latin America indicated that the use of local stories strengthened sequential memory and cognitive anticipation, key aspects in the development of early logical thinking. These results were consistent with those obtained in the present study, where narrative repetition and the sequential nature of the story activated processes of mental ordering and comparison. The narrative did not only organise content; it organised experiences. The child did not learn logic as an abstraction, but as a lived story (Song et al., 2025).

5.3 Discursive Dimension

The discursive dimension revealed the shift from individual narration to collective construction of meaning. In the bibliometric maps, discourse, language, and semantics appeared closely linked to narrative, reflecting a conception of language as a mediator of thought. This finding was consistent with studies conducted in Latin American classrooms where oral exchange, rather than mechanical repetition, supported early argumentation and hypothesis development processes. Teachers (EI.3, EI.6, EI.17) agreed that oral communication in the classroom should not be understood as a repetition technique, but rather as an exercise in discursive construction (Mokwana et al., 2024). Teacher testimonies indicated that narrative interaction favoured explanation, justification and negotiation of meanings. Recent research on early childhood education in South America described similar dynamics, where storytelling allowed children to rehearse explanations, compare points of view, and construct complex semantic relationships from everyday language. Narrative ceased to operate as a literary device and became established as a discursive strategy that supported the transition to early forms of abstract reasoning (Marini et al., 2025).

5.4 Sociocultural Dimension

The analysis of the sociocultural dimension showed the relevance of storytelling in the construction of identity, belonging, and sense of community. The terms ethnicity, migration and identity, observed in the VOSviewer maps, confirmed the expansion of narrative into areas of social and cultural reflection. During the interviews, participants (EI.5, EI.12, EI.27) highlighted that children's stories allowed them to recognise the linguistic and cultural diversity of the classroom (Planas & Pimm, 2024). The sociocultural dimension showed that narrative played a significant role in the construction of identity, belonging, and recognition of diversity. The terms’ identity, migration, and

ethnicity, present in the bibliometric network, confirmed an expansion of the field towards situated approaches. This trend was particularly visible in Latin American research, where children's stories functioned as spaces for cultural recognition and symbolic re-signification in heterogeneous classrooms (Vaidya and Battey, 2022; Weder and Stranzl, 2025).

In the present study, teachers pointed out that the stories facilitated the recognition of diverse languages, traditions, and family experiences. This finding coincided with studies conducted in Andean and Central American educational contexts, where local narratives allowed community knowledge to be integrated into school learning, strengthening the link between cognition and culture (Moreno-Núñez et al., 2025). In this context, narrative operated as a social practice that supported cognitive processes without detaching them from their cultural roots (Debreslioska et al., 2025; Morphett et al., 2025).

5.5 Hermeneutical Triangulation and Interpretative Scope

The triangulation between bibliometric analysis, interviews, and hermeneutic coding allowed us to construct a coherent interpretive network. The emerging categories—narrative mediation, cognitive interaction, and discursive comprehension—aligned with the semantic dimensions identified in recent scientific production. This convergence reinforced the interpretive validity of the study (Lambert et al., 2022). Comparison with Latin American studies allowed us to broaden the theoretical scope of the findings. These were not isolated results or a localised reading. They were pieces of evidence that engaged in dialogue with an expanding regional agenda, where narrative was understood as a cognitive, discursive and cultural practice at the same time. This articulation strengthened the theoretical generalisation and responded directly to the editorial observation (Andrade-Molina, 2021).

5.6 Methodological Reflection

The bibliometric-hermeneutic design proved to be an appropriate way to integrate quantitative data from scientific production with a qualitative understanding of educational discourses. However, it was recognised that the sample of teachers belonged to a single institution, which limited the generalisation of the findings. Likewise, the selection of articles in English partially restricted the epistemological diversity of the basis for analysis. Despite this, the consistency between the three levels of data demonstrated the internal robustness of the design (Ben-Zvi et al., 2025). Triangulation between sources reduced interpretative bias and strengthened the contextual validity of the results.

5.7 Theoretical Projection

In theoretical terms, the study confirmed that children's narratives cannot be understood solely as a reading technique, but rather as an epistemological structure that integrates thought, language and culture. Their ability to organise children's mental and social experiences makes them an essential element of contemporary pedagogy (Mokwana et al., 2024). The findings suggested that storytelling contributes to the formation of linguistic awareness and the development of logical thinking from early childhood. Furthermore, they proposed that early education should consider narrative as a mediation between symbolic knowledge and scientific knowledge. Finally, the convergence of cognitive, discursive and sociocultural approaches provided an integrated view of early learning.

6. Conclusion

The study showed that children's stories were an effective means of understanding the concepts of classification, seriation, and comparison in early childhood education. The results confirmed the alternative hypothesis, showing that narratives promoted cognitive development through dialogic interactions that integrated language, thought, and social experience. Consequently, the null hypothesis was rejected. The analysis allowed us to argue that narrative structures operated as cognitive bridges that organised the mental and symbolic experience of childhood. The three emerging categories—narrative mediation, cognitive interaction, and discursive comprehension—were articulated in a theoretical model that explained logical learning as a cultural and dialogical process. From this perspective, narrative was understood not only as a communicative resource but also as an epistemic system that allowed children to classify, compare, and establish order relationships within meaningful contexts.

This approach had direct educational implications. The findings suggested that teacher training in early childhood education should incorporate narrative mediation strategies aimed at developing logical reasoning, as well as curricular criteria that integrate children's stories into the teaching of basic mathematical concepts. In this sense, narrative offered a coherent pedagogical framework for linking formal content with cultural experiences close to the child, favouring more reflective and situated classroom practices. The research provided an integrated understanding of early learning, in which cognition, discourse and culture were intertwined in the construction of children's logical thinking.

7. Limits

The study faced certain limitations inherent to the bibliometric-hermeneutic design and the empirical context of application:

- The bibliometric analysis was restricted to publications indexed in Scopus during the last decade, which limited the inclusion of previous research and academic productions in other languages or regional databases. This dependence on Anglo-Saxon sources reduced the representation of Latin American thought around children's narrative and its educational function.
- In the qualitative component, the sample of teachers interviewed was concentrated in the same institutional environment, which limited the sociocultural and pedagogical diversity of the experiences analysed. Although the testimonies provided an in-depth insight into the mediating role of storytelling in cognitive understanding, the homogeneity of the context restricted the generalisation of the findings. Future research should include participants from different geographical areas, educational levels, and curricular approaches to strengthen the external validity of the study.
- The integration of bibliometric, hermeneutic, and discursive approaches involved a high degree of analytical complexity. The combined use of VOSviewer and Atlas.ti required interpretation processes that, although rigorous, could introduce biases derived from research subjectivity. This limitation was mitigated by data triangulation and validation between categories, although it is recognised that the interpretative burden may influence the final reading of the results.
- The cross-sectional nature of the study prevented the evaluation of the temporal evolution of learning derived from narrative mediation. The absence of longitudinal follow-up limited the possibility of determining permanence or strengthening of cognitive skills over time.

8. Recommendations

Based on the results and limitations identified, several lines of action and research are proposed.

- In the academic field, it is recommended that the study be expanded to include a longitudinal perspective that allows for observation of the sustained impact of children's narratives on mathematical and symbolic comprehension. A longitudinal design would provide more solid evidence on the permanence of classification, seriation, and comparison skills.
- From a methodological perspective, it would be appropriate to incorporate mixed techniques that integrate direct observation, discourse analysis, and neuroeducational methods to explore how emotions and symbolic processes intervene in cognitive mediation. These approaches would allow for an understanding of the interaction between language, emotion, and thought from an interdisciplinary perspective.
- In the educational field, it is recommended that teacher training in narrative mediation strategies be strengthened. Training programmes should include specific modules on language, cognition and pedagogical hermeneutics, so that teachers acquire the tools to conduct dialogical processes that articulate emotion and logical reasoning. In addition, it is suggested that curriculum materials be designed based on local stories and diverse cultural contexts, favouring the connection between the child's identity and their cognitive development.
- At a theoretical level, we are encouraged to consolidate an integrative model that recognises children's narratives as an epistemic system capable of linking the cognitive, discursive and sociocultural aspects of learning. This line of study would enable the development of new pedagogical approaches that view children's literature not only as a teaching resource, but also as a structure of thought that supports the construction of knowledge in early childhood.

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