



Building a Culture of Thinking in Early Childhood Education with Non-Fiction Picturebooks and Thinking Routines

Construir una cultura de pensamiento en Educación Infantil con libros ilustrados de no ficción y rutinas de pensamiento

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Abstract

This study aims to understand how a culture of thinking is shaped in Early Childhood Education classrooms through teacher mediation, the use of non-fiction picturebooks, and the implementation of thinking routines. A qualitative approach was adopted, following a collaborative practical action-research design. The participants were five teachers and 60 Early Childhood Education pupils from a public school in Valladolid, Spain. Data was collected through teacher observation records, children's graphic productions and verbalizations, follow-up group interviews, and a final focus group. Qualitative content analysis, supported by ATLAS.ti, enabled the findings to be organized into three dimensions: conditions for building a culture of thinking, mediation in the use of non-fiction picturebooks and thinking routines, and manifestations of children's thinking. The findings suggest that the culture of thinking was shaped through the articulation of time, language, opportunities for participation, interaction,

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visual support, and teacher feedback around the use of thinking routines. Likewise, non-fiction picturebooks contributed to the promotion of these cultural forces through observation, curiosity, conversation, and autonomous access to content. The children's evidence revealed manifestations related to observing and describing, formulating questions, making connections, and capturing the essence, with varying degrees of mediation depending on age and routine. It is concluded that the integration of non-fiction reading, thinking routines, and teacher mediation offers opportunities to promote and make children's thinking visible in real classroom contexts.

Keywords: culture of thinking; non-fiction picturebooks; thinking routines; teacher mediation.

Resumen

El estudio tiene como objetivo comprender cómo se configura una cultura de pensamiento en aulas de Educación Infantil mediante la mediación docente, el uso de libros ilustrados de no ficción y la implementación de rutinas de pensamiento. Se adopta un enfoque cualitativo con diseño de investigación-acción práctica de orientación colaborativa. Participaron cinco maestras y 60 escolares de Educación Infantil de un centro público de Valladolid (España). La información se recogió mediante hojas de registro docente, producciones gráficas y verbalizaciones del alumnado, entrevistas grupales de seguimiento y un grupo de discusión final. El análisis de contenido cualitativo, apoyado en ATLAS.ti, permitió organizar los resultados en tres dimensiones: condiciones para la construcción de una cultura de pensamiento, mediación en el uso de libros ilustrados de no ficción y rutinas, y manifestaciones del pensamiento infantil. Los resultados sugieren que la cultura de pensamiento se configuró a partir de la articulación de tiempo, lenguaje, oportunidades de participación, interacción, apoyos visuales y retroalimentación docente en torno al uso de rutinas. Asimismo, los libros ilustrados de no ficción favorecieron estas fuerzas culturales mediante la observación, la curiosidad, la conversación y el acceso autónomo al contenido. Las evidencias del alumnado mostraron manifestaciones vinculadas a observar y describir, formular preguntas, establecer conexiones y captar lo esencial, con distinto grado de mediación según la edad y la rutina. Se concluye que la integración de lectura no ficcional, rutinas de pensamiento y mediación docente ofrece oportunidades para promover y visibilizar el pensamiento infantil en contextos reales.

Palabras clave: cultura de pensamiento; libros ilustrados de no ficción; rutinas de pensamiento; mediación docente.

Introduction

Childhood is a particularly significant period for making sense of the world. In early childhood, children begin to interpret the phenomena around them through observation, action, language and interaction with others (Vygotsky, 1978). From a sociocultural perspective, learning is understood as participation in mediated experiences that enable

meanings to be named, organised and shared, rather than as a mere acquisition of information (Bruner, 1996). Language development plays a central role in this process, acting as means of communication and as a tool for jointly constructing knowledge and making thought processes explicit (Mercer, 2000).

Applied to the educational context, this perspective helps us to understand that the value of classroom interactions depends, above all, on the quality of the opportunities they provide for thinking, discussing and constructing meaning, rather than on their frequency (Mercer & Littleton, 2007). In early years education, shared reading and discussion of texts provide a particularly favourable context for activating comprehension strategies, formulating questions, taking turns to speak and constructing meaning with adult mediation (Larriet, 2021; Llamazares Prieto & Alonso-Cortés, 2016). In school life, communicative dynamics of a reproductive nature may occur, centred on repetition and immediate response, but there are also dialogical situations geared towards exploration, argumentation, the review of ideas and becoming aware of one's own thinking (Alexander, 2020). Consequently, the school environment requires intentional pedagogical conditions to enable pupils to observe, ask questions, challenge assumptions, make connections, explain and review their ideas, rather than merely responding automatically.

In this regard, the culture of thinking offers a particularly relevant pedagogical framework for placing reflective activity at the heart of classroom life. The approach comprises eight cultural forces that shape the possibilities for reflective learning: expectations, opportunities, time, modelling, language, environment, interactions and routines (Ritchhart, 2015). Creating a culture of thinking requires attention to the beliefs, attitudes, practices and interactions that guide teaching, as well as the use of specific routines or techniques (Ritchhart, 2023). Thus, this set of processes helps pupils to understand information, explore ideas in depth and construct knowledge in a progressive and collaborative manner.

Linked to the culture of thinking, the visible thinking approach plays a prominent role, as it proposes strategies for externalising reasoning processes that usually remain implicit in pupils' intellectual activity (Ritchhart et al., 2014). In this way, attention is paid to the mental process that each individual sets in motion when they observe, formulate a question, generate ideas, establish connections or exchange points of view. Consequently, error is no longer viewed as a shortcoming but becomes an opportunity to review, adjust and reconstruct one's thinking (Hattie, 2009).

One of the defining features of the visible thinking approach is that of thinking routines, which in turn constitute one of the cultural forces (Ritchhart, 2015). These are defined as brief pedagogical structures that guide reflection and facilitate the organisation and communication of ideas (Ritchhart & Perkins, 2008). They constitute a cognitive scaffold that helps to make the thinking process visible and to strengthen intellectual dispositions. However, their potential lies in their inclusion within a classroom culture that provides time to think, language to name processes, interactions to compare meanings, and opportunities to review what has been learnt (Ritchhart et al., 2014; Ritchhart, 2015). In the absence of these conditions, routines can become decontextualised or mechanical activities reduced to a sequence of questions or instructions.

Alongside these routines, the resources incorporated into the classroom play a decisive role in creating opportunities for thinking. Reading, within this framework, is understood as a process of interpretation involving various systems of meaning, going beyond the decoding of the written code. In addition to words, images, composition, colour, the layout of information and other graphic elements construct meaning and guide the reader's comprehension (Kress & van Leeuwen, 2006; Serafini, 2014). From the perspective of cognitive psychology, the interplay between verbal and visual language can be linked to the dual coding of information and to approaches to multimedia learning, according to which the combination of words and images fosters the construction of richer mental representations and facilitates comprehension when both codes are meaningfully integrated (Mayer, 2024; Sadoski & Paivio, 2013).

It is here that illustrated non-fiction books (hereinafter referred to as LINF) take on particular significance, as they feature a varied and predominant visual language (Álvarez & San Miguel, 2025; Romero et al., 2024). These books combine information, images, design and visual organisation, making them a suitable resource for promoting reading geared towards discovery, inquiry and understanding of the world (Tabernero & Colón, 2023). They therefore represent a learning opportunity which, when integrated with thinking routines and other cultural influences, can create spaces for reflection in which reading involves observing attentively, connecting ideas, addressing initial questions, opening up new avenues of inquiry and communicating one's own thoughts (San Miguel, 2024).

Although recent research has highlighted the value of LINFs as multimodal objects that broaden the ways in which children read and foster curiosity, informational

comprehension, visual reading and knowledge construction (Romero-Oliva et al., 2023; Tabernero & Colón, 2023; Tabernero & Laliena, 2023), the relationship between these resources and pedagogical approaches aimed at making thinking visible and developing cognitive and metacognitive skills has been less extensively explored.

Building on this approach, the overall aim of the study is to understand how a culture of thinking is fostered in Early Years classrooms through teacher mediation, the use of LINF and the implementation of thinking routines. To this end, three specific objectives are established: a) to identify the pedagogical conditions that foster a culture of thinking; b) to analyse how teacher mediation is articulated in the reading of LINF and in the implementation of thinking routines; c) to describe the manifestations of children's thinking that emerge in their drawings, verbal expressions and records linked to the routines.

In line with these objectives, the following research questions are posed: what pedagogical conditions favour the development of a culture of thinking in early years classrooms?; how is teacher mediation integrated into the use of LINF and thinking routines?; what manifestations of children's thinking emerge in their work and verbalisations during the implementation of these routines?

Methodology

Method

The study follows a qualitative approach and adopts a collaborative action-research design (Hernández-Sampieri & Mendoza, 2018; Latorre, 2003). The methodological choice stems from the origin of the intervention, which arose from a request by the Early Years teaching team, who were keen to develop a culture of thinking in their classrooms. Based on this need, a collaborative process was established between the teachers and the research team to design, implement and review a proposal based on teacher mediation, thinking routines and non-fiction reading. The research was carried out through successive cycles of training, planning, action, observation and reflection, aimed at progressively refining the proposal based on the evidence gathered.

Participants

The study was carried out during the 2024–2025 academic year at a state Early Years and Primary school located in a rural area of Valladolid, Spain. To preserve the anonymity

of the setting and the participants, no identifying details of the school are provided. The school catered for a diverse pupil body and maintained an approach open to participation in educational innovation initiatives.

The five Early Years teachers took a direct part in the training, planning, implementation, documentation of evidence and joint reflection on the process. Their inclusion in the study was intentional, as they constituted the entire teaching team for this stage and were motivated by a shared desire: to learn about and apply approaches that would foster the development of a culture of thinking in their classrooms. Although they had no prior specific training in visible thinking nor systematic experience with thinking routines, they showed an interest in exploring its educational potential in Early Years Education. Furthermore, 60 pre-school children took part in the study, divided into five groups: 15 in the 3-year-old group, 13 in the 4-year-old A group, 12 in the 4-year-old B group, 10 in the 5-year-old A group and 10 in the 5-year-old B group. Their drawings, verbal expressions and classroom records were considered qualitative evidence for analysing manifestations of children's thinking.

Strategies

Data were collected using qualitative techniques designed to integrate the teachers' perspective with the evidence generated by the pupils. The data collection process was carried out primarily by the teachers, owing to the collaborative nature of action research and the fact that it took place within the ordinary classroom context. This approach allowed for the documentation of pupils' responses in natural situations involving reading, interaction and the use of routines, although it also meant acknowledging the limitation posed by the teacher's perspective in the recording of the evidence. To reduce this bias, the work, verbal responses and record sheets were cross-checked during follow-up meetings and in the final focus group.

Firstly, teacher observation was documented using record sheets. These sheets were designed *specifically* for the study and revised during the pilot phase. They included information on the group, the date, the resource used, the routine applied, the cognitive process being developed, a description of the activity, the pupils' responses and verbalisations, the difficulties observed and the adjustments made by the teacher. Secondly, a documentary analysis was carried out of the pupils' graphic productions, supplemented by the verbal comments and observations recorded during the activities.

In this way, the final production could be linked to the child’s oral explanation and to the contextual interpretation provided by the teacher.

In addition, follow-up group interviews were conducted with the five teachers, linked to the action research cycles and aimed at reviewing the proposal, identifying difficulties and agreeing on adjustments. At the end of the term, a semi-structured focus group was held as a reflective conclusion to the process, with the aim of assessing the experience as a whole and examining in greater depth the teacher’s mediation, the thought processes observed, the methodological strategies and the role of routines in building a culture of thinking. To preserve anonymity and facilitate the traceability of the evidence cited in the results, the coding system set out in Table 1 was used.

Table 1
Coding system for qualitative evidence.

Component of the Code	Codes used	Meaning
Source of information	GFF; HRD; PGA; VA	Final discussion group; teacher’s record sheet; pupils’ artwork; pupils’ verbal responses.
Participant	M3; M4A; M4B; M5A; M5B	Teachers of the 3-year-old, 4-year-old A, 4-year-old B, 5-year-old A and 5-year-old B groups.
Citation format	Source-participant	For example, GDF-M5A identifies a quote from the final focus group discussion by the Year 5A teacher; HRD-M3 identifies evidence from the Year 3 teacher’s lesson plan.

Procedure

The procedure was organised into four successive phases, structured according to the cyclical logic of action research: training and piloting, diagnostic observation, implementation and monitoring, and reflective closure (Figure 1). Throughout these phases, there was n collaboration between the participating teachers and the research team, so that the decisions taken were progressively reviewed on the basis of the evidence gathered and shared reflection.

During the first term, a four-week training programme was delivered for the teaching staff. The training covered the theoretical framework of the culture of thinking, the operationalisation of thought processes, the adaptation of routines to the Early Years stage, and the pedagogical potential of the LINFs. During this period, a pilot study of the teacher's observation sheet was also carried out, with the aim of refining the instrument, reviewing the observation criteria and familiarising the teachers with its use. The evidence gathered during this phase was exploratory in nature and was not included in the subsequent analysis.

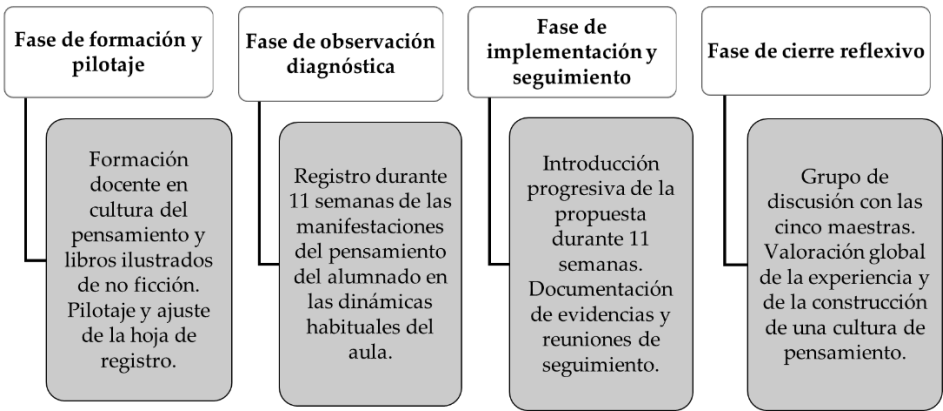
In the second term, an eleven-week diagnostic observation phase took place, prior to the explicit and systematic introduction of the proposal. Throughout this period, the teachers recorded how the selected thinking processes (observing and describing, questioning and asking questions, making connections and grasping the essentials) emerged within the usual classroom dynamics, without yet intentionally incorporating the thinking routines or the mediated use of LINF. This phase enabled the research team to understand the context, the interactions and the ways in which pupils participated, as well as to guide the subsequent design of the activities.

In the third term, the phase of progressive implementation of the proposal took place, lasting eleven school weeks. The intervention was linked to the year-group project on the seabed, common to all Early Years groups, which enabled the LINF and routines to be integrated into a shared theme, although each teacher adapted them to the age, pace and needs of their group. The routines selected were *'I See–I Feel–I Wonder'*, *'Colour–Word–Image'* and *'Headline'*, due to their connection with the thought processes being developed: observing and describing, wondering and asking questions, making connections and grasping the essentials. Alongside the books, physical 'thinking' cards were used which visually represented each thought process and served as a support for recalling, naming and guiding the cognitive process during the activities. The sessions, designed by each teacher based on the training and shared resources, were reviewed in follow-up meetings to adjust instructions, support measures and routines.

The session concluded with a final discussion group involving the five participating teachers, designed as a forum for an overall assessment and joint reflection on the experience. The session proved particularly valuable, as, based on open-ended questions posed by one of the researchers, the teachers explored in greater depth their perceptions of the implementation of the initiative, the pupils' responses, the facilitation decisions taken,

and the role of both routines and LINFs in fostering a culture of thinking in their classrooms.

Figure 1
Stages of the procedure followed in the study.



The qualitative nature of the study and its action-research design made it necessary to adhere to the criteria specific to the naturalistic paradigm: credibility, transferability, dependability and confirmability (Guba & Lincoln, 1985; Hernández-Sampieri & Mendoza, 2018).

Credibility was enhanced through the use of a variety of techniques and instruments and the triangulation of sources (pupils’ work, teachers’ records, follow-up group interviews and a final focus group). Generalisability was addressed through a contextualised description of the school, the participants, the procedure and the activities carried out, without seeking to make a statistical generalisation of the results. Dependability was ensured through the systematic documentation of the process using record sheets, follow-up minutes and agreements linked to the action research cycles. Confirmability was enhanced by comparing interpretations with evidence, as well as through a joint review by the teachers and the research team.

With regard to ethical rigour, in accordance with the guidelines specific to educational research, the principles of informed consent, confidentiality, anonymity and the responsible use of information were observed (Hernández-Sampieri & Mendoza, 2018). The study was approved by the Research Ethics Committee of the University of Valladolid, under code 2025-CEUVa-045-Z-1-C-4. The teachers’ participation was

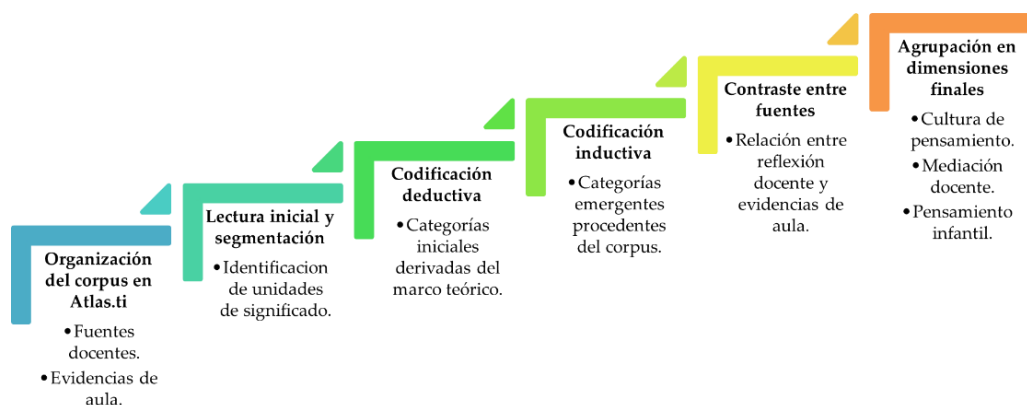
voluntary and based on their informed consent. In the case of the pupils, authorisation was obtained through the informed consent of their legal guardians. Furthermore, the pupils' assent was sought through verbal explanations adapted to their age and the classroom context, whilst respecting their voluntary participation, their individual paces and the option not to take part or not to complete any task related to the study. Consequently, the information collected was used exclusively for research purposes, ensuring the anonymity of the school, the participating teachers, the pupils and the class groups through identification codes, as well as honest, transparent and respectful communication of the results.

Analysis of the data

A qualitative content analysis was carried out, suitable for systematically interpreting the textual, documentary and graphical evidence collected during the study (Mayring, 2014). The analysis process was supported by the ATLAS.ti programme, which was used as a tool for organising the corpus, coding the evidence and establishing relationships between codes, categories and sources of information (San Martín, 2014). However, the interpretation of the data was carried out by the research team; consequently, the *software* was regarded as a support resource for systematising the analytical process. The analytical sequence is summarised in Figure 2.

Figure 2

Process followed in the analysis of information.



The corpus was organised into two complementary levels. On the one hand, teaching sources were included, comprising the transcript of the final focus group, the minutes of the follow-up group interviews and the teachers' record sheets. On the other hand, classroom evidence was analysed, comprising pupils' visual work, verbal contributions recorded during activities, and records relating to thinking routines and non-fiction reading processes. The chosen organisation made it possible to link teachers' reflections with the evidence generated by pupils during the course of the project.

The coding process combined deductive and inductive approaches, enabling us to build on prior theoretical categories whilst also attending to emerging meanings derived from the corpus (Hernández-Sampieri & Mendoza, 2018; Saldaña, 2021). Firstly, deductive coding was based on the theoretical framework concerning the culture of thinking and visible thinking (Ritchhart, 2015; Ritchhart et al., 2014; Ritchhart & Perkins, 2008), as well as on contributions regarding thinking-based learning and non-fiction reading as a context for activating comprehension processes (Ruiz, 2020; Swartz et al., 2014; Tabernero & Colón, 2023). Based on this framework, initial categories were defined relating to the conditions for building a culture of thinking, the mediated use of non-fiction texts and routines, teachers' linguistic and methodological mediation, and manifestations of students' thought processes.

Secondly, inductive coding enabled the incorporation of emerging categories derived from the evidence itself. These included adaptations made according to the group and age, the role of the teacher's questioning, the importance of time and continuity, the selection of resources, pupils' autonomy in using the books, the differences observed between routines, and the changes perceived by the teachers in classroom dynamics.

Given the action research design, the analysis incorporated a process-oriented approach to the study (Latorre, 2003). The monitoring records made it possible to reconstruct the cycles of planning, action, observation and reflection, taking into account the decisions taken, the difficulties identified, the adjustments made, the changes in teacher mediation and the evolution in the use of routines. In turn, the final focus group discussion enabled a comprehensive interpretation of the process. The categories constructed from the teachers' sources were cross-referenced with the pupils' graphic work, their verbal comments and the classroom records. In analysing the pupils' work, attention was paid to the routine applied, the instruction given, the resource or book linked to the activity, the associated verbal comments, and the pedagogical interpretation recorded by the teacher in

the teaching log, which provided context for the work. In this way, this evidence was not used as isolated examples, but as material to cross-check, refine and expand upon the teacher's interpretation.

Finally, the set of codes emerging from the study's qualitative content analysis was grouped into three broad dimensions, described in the results, aligned with the research questions. Based on these dimensions, the final interpretation of the corpus was organised and relationships were established between the teacher's perspective, the pupils' evidence and the evolution of the proposal throughout the action research process.

Results

The results are organised into three dimensions: 1) conditions for the development of a culture of thinking; 2) teachers' facilitation of the use of LINFs and thinking routines; and 3) manifestations of children's thinking in their work, verbal expressions and records.

1. Conditions for the development of a culture of thinking. The first dimension brings together the elements that facilitated the gradual transformation of the classroom into a space for thinking. The results show that the culture of thinking was underpinned by a set of pedagogical conditions sustained over time: the creation of an atmosphere of reflection, the provision of opportunities to verbalise ideas, the conscious use of language, the quality of interactions, the valuing of children's contributions, and the teacher's role as a facilitator of thinking.

1.1. An atmosphere of reflection, time to think and opportunities. One of the key conditions was the creation of a classroom atmosphere in which pupils were able to pause, observe, verbalise, listen and participate. The teachers indicated that the introduction of routines and LINF altered the usual way of approaching reading sessions, which came to be conducted as more unhurried, dialogical and reflection-oriented situations.

Time emerged as a key pedagogical factor. Teachers noticed that reading sessions were taking longer, although this extension was seen as an opportunity to encourage pupils' expression. It was noted that "the way we tell the story using these questions has changed", as "it went on for longer" and pupils had "the opportunity too to express what it made them think" (GDF-M4A). In the same vein, it was emphasised that reading sessions could be extended, but with more active participation: "we used to spend 40 minutes [...] now it's as if they're participating in the story and reflecting on it there and then" (GDF-M5A).

Opportunities for reflection were particularly linked to moments of shared reading. This dynamic took shape, for example, in a sequence of exploration and inquiry in which the children first observed, then asked questions, and finally turned to the book to investigate: “first we looked, asked ourselves some questions, and then I’d say, ‘Right then! Let’s investigate’” (GDF-M5A). In this way, shared reading shifted from focusing solely on the transmission of content to becoming a situation of observation, conversation and inquiry.

The atmosphere of reflection was also sustained through the valuing of the children’s contributions. The teachers observed that, with more time and opportunities to contribute, the children participated with greater confidence in oral exchanges. Overall, the results of this dimension show that the culture of thinking was underpinned by spaces for interaction where pupils could pause, express ideas and actively engage with what they had read.

- 1.2. *Language, teachers’ expectations and the teacher’s facilitating role.* Language emerged as a cross-cutting factor in the development of a culture of thinking. The teachers noted that systematic work with routines and ‘ ’ thinking strategies fostered greater awareness of language use, both amongst the pupils and in their own teaching practice. Expressions related to observing, describing, asking questions or summarising began to form part of the classroom’s everyday repertoire.

The gradual internalisation of certain phrases characteristic of the culture of thinking became evident in spontaneous situations. During reading sessions, some children used expressions such as ‘I wonder why...’ (GDF-M5A), which was interpreted as a sign of their gradually taking on board the language associated with the routines. The teachers linked this incorporation to a greater awareness of thinking and an improvement in classroom language.

Teachers’ expectations also changed during the process. Some teachers expressed initial doubts about the possibility of working on thought processes in Early Years Education. This initial difficulty was expressed as follows: “For me, it’s been quite a revelation. Firstly, as an adult, because it was so abstract! How am I going to explain this? What will they understand from this?” (GDF-M4B). However, the subsequent assessment was positive, recognising progress in oral expression, participation, autonomy and awareness of thinking, although not uniformly across all groups or in all the thinking processes worked on.

Within this culture of thinking, the teacher's role emerged as a key factor. The teachers acted as guides, observers and facilitators, creating opportunities for the pupils to articulate what they observed, imagined, made connections between or synthesised. This transformation was succinctly expressed by the statement that they had become "very much guides and observers" (GDF-M3). It also had an impact on the teachers' self-perception, as they became aware of expressions they were already using, whilst gaining a better understanding of "why we say it, how we say it and to what end we say it" (GDF-M3).

2. **Mediation in the use of LINFs and thinking routines.** The second dimension encompasses the resources and strategies that enabled the integration of LINFs, routines and thinking processes. The results show that mediation involved organising visual aids, adjusting work formats, providing feedback and adapting the activities to the characteristics of each group, beyond simply selecting materials.

- 2.1. *Teaching aids: LINF, flashcards and visual aids.* The LINF played a central role in the programme, as they combined information, images and opportunities for inquiry. The teachers linked them to the stage-specific projects and the topics covered in the classroom, so that they served as a starting point for observing, asking questions, expanding vocabulary and sparking the pupils' curiosity. For example, the selection of extracts from **El gran libro del mar** (Zommer, 2018) was based on the animals the pupils wanted to investigate, which allowed them to 'explore a little further' because 'they are very curious' (GDF-M4A).

The visual component of the books proved particularly relevant in Early Years Education. The teachers noted that the images facilitated independent access to the content, especially at a stage when pupils have not yet fully mastered the written code. In this regard, it was emphasised that the children "have not yet acquired the written code, but they do understand the code of these images", so they could open the book and access the information "without needing anyone's help" (GDF-M4B). Furthermore, the LINFs were valued as motivational resources, capable of capturing the group's attention and sustaining conversation about what had been read.

Alongside the books, thinking cards and other visual aids served as scaffolding to focus pupils' attention on the thought processes. The use of the cards was rated as "very positive" due to their visual nature, as they enabled pupils to understand

“what they had to do” and to focus on the thought process being worked on (GDF-M3). Consequently, the selected resources acted as support materials and as mediators that guided observation, inquiry and verbalisation.

- 2.2. *Methodological strategies: feedback, working formats and adaptations.* Teacher mediation was also evident in the adaptation of routines to the characteristics of each group. The teachers adjusted timings, instructions, support and working formats according to the pupils’ age, classroom dynamics and the responses observed during implementation.

Teacher feedback emerged as a key strategy for guiding thinking and clarifying the task. The linguistic supports associated with the cards helped to guide observation and understanding of the instructions more precisely. In this regard, one teacher stated that “that *feedback* has been key to helping them understand what I was asking of them” (GDF-M4B), whilst another noted that it helped to clarify “the purpose of the cards and the purpose of the thought processes” (GDF-M3).

Rephrasing instructions and questions was another important strategy. At times, progress depended on finding a more appropriate way of phrasing things: ‘ask it another way’ (GDF-M5A). In this way, linguistic mediation helped to sustain participation and ensured that the children’s responses did not remain automatic or superficial.

The choice of working format was also significant. Some teachers opted for group routines, particularly during initial exploration activities, whilst others introduced individual formats to avoid repeated or imitated responses. Some routines were carried out individually after it was observed that, when done in a group, the pupils ‘ended up copying one another’ and repeated what their classmates said, without formulating their own response (GDF-M5A). Consequently, the working format was adapted to the purpose of each routine and the characteristics of the group.

3. Manifestations of children’s thinking in productions, verbalisations and records.

The third dimension encompasses the manifestations of children’s thinking linked to non-fiction reading processes and thinking routines, as identified in the pupils’ drawings, their verbalisations and the teachers’ records.

- 3.1. *Routines for presenting and exploring ideas: observing, describing and asking questions.*

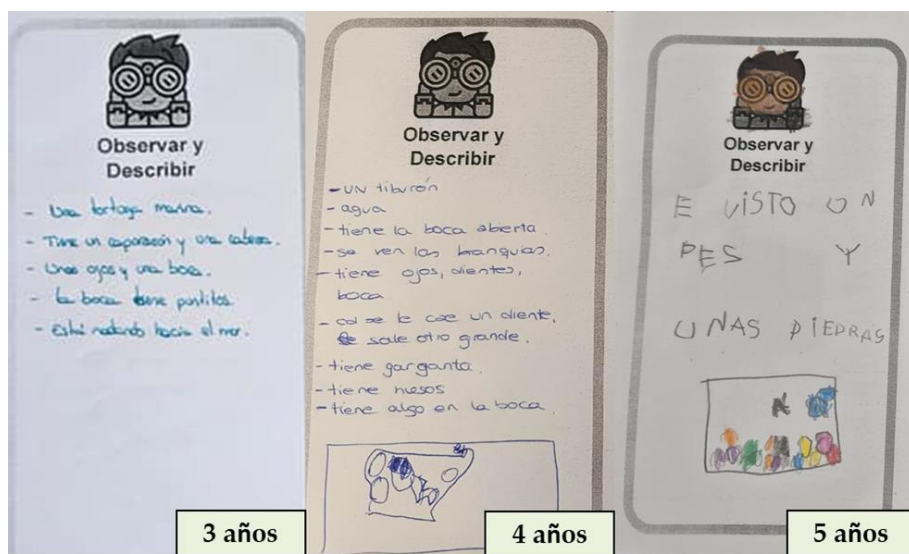
Routines aimed at presenting and exploring ideas particularly encouraged observation, description and the initial formulation of questions. In the ‘*I See–I Feel–I Wonder*’ routine, pupils were able to engage with the content of the non-fiction

books based on what they observed in the images, the feelings these evoked in them, and the questions that arose during reading or the activity.

The process of observing and describing was the one that emerged most clearly. The pupils' work and verbal responses captured visible elements from the pictures, such as characters, animals, colours, actions or details present in the books. The teachers noted that this process proved more accessible for the different groups, particularly when the instruction was supported by clear images and questions designed to encourage careful observation. This trend can be seen in the examples from the 'I See' section of the 'I See–I Feel–I Wonder' routine (Figure 3).

Figure 3

'I See' section of the 'I See–I Feel–I Wonder' routine.



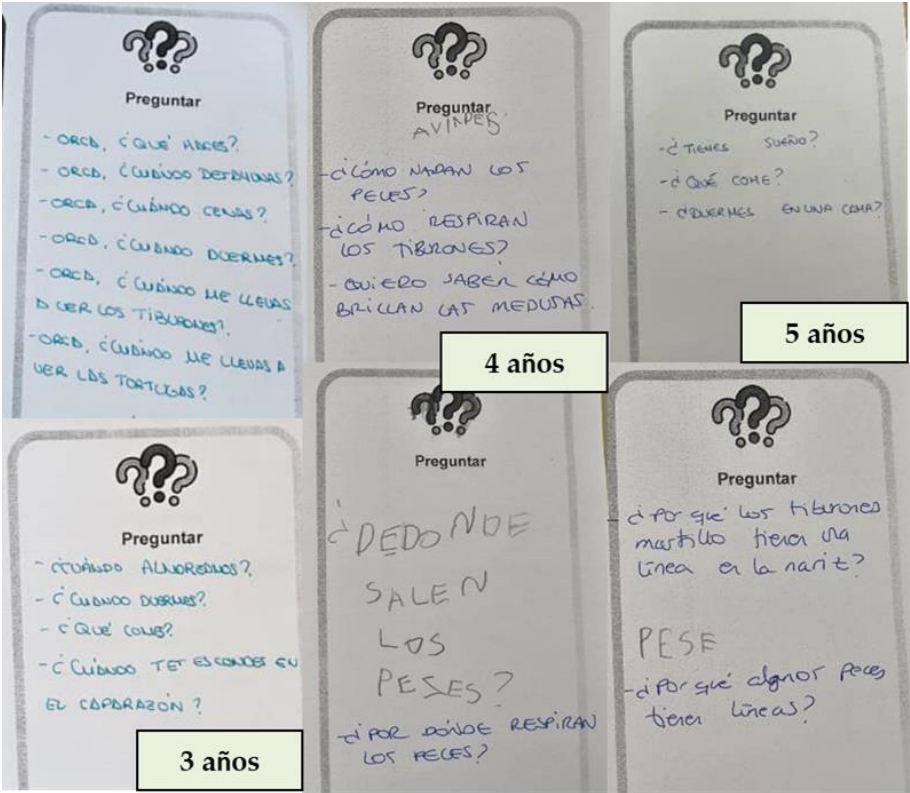
Note. The figure shows examples from the 'I see' section, the first stage of the 'I see–I feel–I wonder' routine. For the 3- and 5-year-olds, the responses are presented as transcribed by the teacher from the pupils' verbalisations; for the 5-year-old, the child's own words are retained. The routine was carried out individually with the 3- and 5-year-olds, and in a group setting with the 4-year-olds.

The formulation of questions, by contrast, showed greater complexity (Figure 4). In the younger age groups, the 'I wonder' phase tended to relate to aspects closely linked to the content being studied, albeit with repetitive or superficial phrasing. In

the 3-year-old group, it was noted that, 'as soon as they realised it was OK to ask "How does it swim?", "What does it eat?" ... it was all "How does it swim?" and "What does it eat?"' (GDF-M3). The result shows an initial approach to questioning linked to the activity, but still limited in variety and depth (Figure 4a).

Progress was observed in the 4-year-old groups, although the questioning aspect remained uneven (Figure 4b). In the 4-year-old A group, it was noted that some children asked 'interesting questions relating to what they want to know about it', although the 'I wonder' aspect had become 'a bit brief' (GDF-M4A). In the 5-year-old groups, questions emerged that were more closely linked to the pupils' enquiries and interests (Figure 4c). Thus, in the 5-year-old B group, it was noted that the pupils 'ask loads of questions' and that 'they ask to find out' (GDF-M5B).

Figure 4
The 'I wonder' section of the 'I see-I feel-I wonder' routine.



Note. The figure shows examples of the 'I wonder' section of the 'I see-I feel-I wonder' routine.

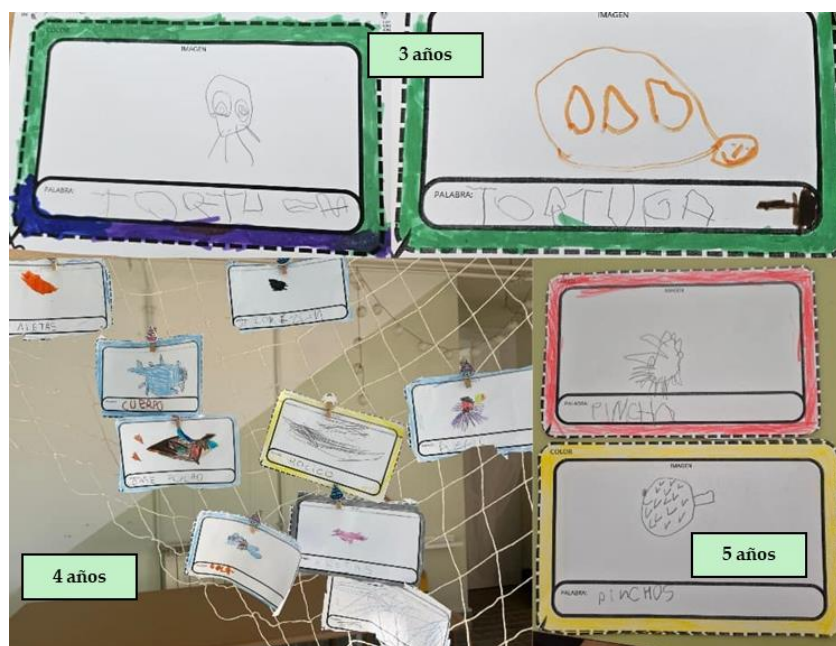
routine, implemented on an individual basis in the 3-, 4- and 5-year-old groups. Teacher mediation is evident in those instances where the teacher transcribes or assists with the written formulation of the questions posed by the pupils.

3.2. *Routines for synthesising and organising ideas: making connections and grasping the essentials.* Routines aimed at synthesising and organising ideas fostered thought processes linked to making connections and grasping the essentials. In all groups, particular emphasis was placed on the 'Colour-Word-Image' and 'Headline' routines, which required pupils to select, relate and condense significant aspects of the content covered.

The *Colour-Word-Image* routine made it possible to observe how the children established connections between the content of the LINFs and various expressive elements (colour, word and image). Responses based on words or images tended to show the relationship with the book or the activity more clearly, whilst the choice of colour often required a verbal explanation to interpret the meaning of the output. Consequently, the verbalisations associated with the pupils' choices and the pedagogical interpretation recorded in the teachers' notes proved essential for understanding the thought processes that were triggered.

However, this routine generated mixed responses, particularly when pupils had to justify symbolic associations or establish less obvious relationships between colour, word and image (Figure 5). In the 3-year-olds, green was linked to the tortoise's shell and blue to the sea (PGA/VA-M3); in Year 4, features such as 'fins', 'body', 'tail' or 'eats octopus' were identified (PGA/VA-M4B); and, in Year 5, colour associations linked to the hue of the pufferfish, the 'red spines' or more personal connections emerged (PGA/VA-M5B). The teacher's guidance was key to unravelling the meaning of some of the children's work and distinguishing between interpretable and non-interpretable responses.

Figure 5
Colour–Word–Image thinking routine.



Note. During the activity, each group worked on different animals associated with the marine world, based on reading and exploring the LINF books **The Great Book of the Sea** (Zommer, 2018) and **In the Ocean** (Ferguson, 2008). The figure shows a selection of examples from the ‘Colour–Word–Image’ routine; it does not therefore include all the animals or all the work produced in each classroom.

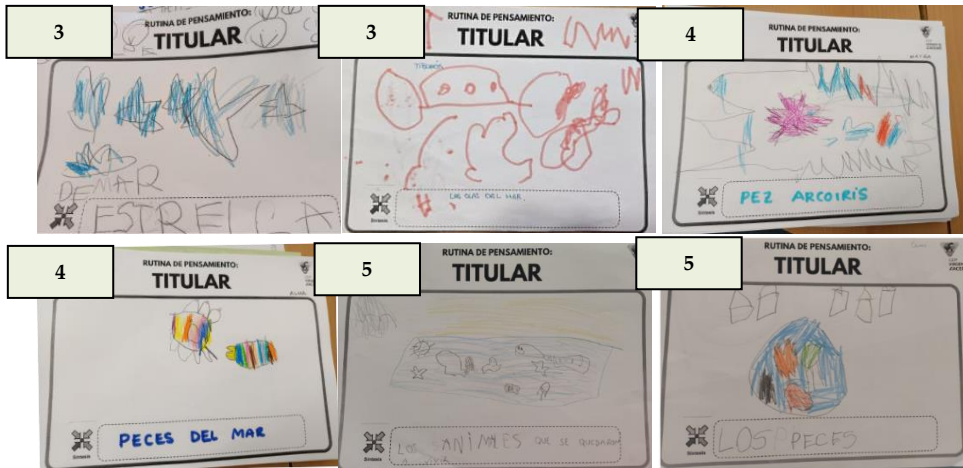
In addition, the ‘Headline’ routine enabled us to observe the process of identifying the key points during the initial activities to launch the projects. Across all three levels, the routine was based on a shared experience of observation, conversation and exploration linked to the topic that would subsequently be explored using the LINF books. In these situations, the book was also present as a visual and motivational resource, although the activity was designed as an initial approach aimed at fostering an atmosphere of curiosity, observation and synthesis, rather than as a complete reading session.

The outputs collected show different ways of condensing the experience into a single word or brief expression (Figure 6). In some cases, the headlines referred to overarching elements of the topic being explored, whilst in others they focused on specific animals, striking features or the pupils’ preferences. The activity aimed to

“encourage observation and lead to synthesis” (HRD-M4A), and expressions such as “the seabed”, “the fish” or “the stars” were recorded (PGA/VA-M4A).

Figure 6

Thinking Routine: Headline.



Note: The figure shows examples of the ‘*Titular*’ routine in the 3-, 4- and 5-year-old groups, carried out during initial observation, exploration and conversation activities linked to the project.

Discussion

The analysis carried out provides an understanding of how a culture of thinking is shaped in Early Years Education through teacher mediation, the use of LINF and thinking routines. In relation to the first research question, the findings suggest that this culture was shaped through the articulation of sustained pedagogical conditions: a supportive environment for expressing ideas, specific times for observing and verbalising, opportunities for participation, visual aids, shared language and teacher feedback. This interpretation is consistent with Ritchhart (2015, 2023), who conceives of a culture of thinking as a network of cultural forces that permeate classroom life. From a critical perspective, the results show that routines take on meaning when they are integrated into ongoing teacher mediation, which is capable of guiding observation, supporting the formulation of questions, fostering connections with prior experiences and facilitating synthesis. At the same time, the experience highlights significant limitations, particularly in the formulation of deep questions, the level of abstraction required by some routines, and

the ability to condense ideas – aspects influenced by the pupils' age, the heterogeneity of the groups, and the methodological decisions adopted. This interpretation aligns with the sociocultural theory of learning, demonstrating that pupils' thinking and cognitive processes can be made visible in situations mediated by language and shared participation (Alexander, 2020; Bruner, 1996; Gómez-Barreto et al., 2025; Mercer, 2000; Mercer & Littleton, 2007; Vygotsky, 1978).

With regard to the second question, the evidence analysed suggests that the interaction between the teacher and the pupils helped to transform the LINFs and routines into genuine opportunities for thinking. Questions, visual aids, pauses, rephrasing and feedback served as scaffolding to guide observation, verbalisation and the shared construction of meaning. In this process, shared reading and discussion of the texts and images served as spaces for mediation in which pupils could activate comprehension strategies, ask questions and review their ideas (Larriet, 2021; Llamazares Prieto & Alonso-Cortés, 2016). The books served as visual and multimodal resources, as well as informative materials, by encouraging observation, curiosity, conversation and independent access to the content. This approach is consistent with studies that view reading as a process in which images, composition, colour and graphic layout play a part in the construction of meaning (Kress & van Leeuwen, 2006; Serafini, 2014), as well as with research highlighting the potential of LINFs to promote visual reading, informational comprehension and inquiry in early childhood (Romero-Oliva et al., 2023; Tabernero & Colón, 2023; Tabernero & Laliena, 2023).

A key contribution of the study lies in demonstrating that the potential of LINFs can be enhanced when integrated with intentional routines and interactions in the classroom. From this perspective, routines can be understood as flexible structures—far removed from mechanical application—which require adaptation, feedback and reformulation. The findings thus align with the conception of routines as scaffolding that helps to make thinking visible (Ritchhart & Perkins, 2008) and enables attention to be paid to the mental processes that pupils engage in when observing, describing, formulating questions, making connections or grasping the essentials (Ritchhart et al., 2014). Consequently, their value would lie both in the structure of the routine and in the quality of the interactions generated around it, as well as in the teacher's ability to sustain, expand upon and reflect back to the pupils their own thinking.

With regard to the third research question, the children's outputs, verbalisations and the teacher's records helped to identify distinct manifestations of children's thinking.

Observing and describing emerged as the most accessible processes, particularly when activities were supported by images and instructions designed to encourage careful observation. By contrast, asking questions, making connections and grasping the essential points appeared to require greater mediation depending on the children's age, the group and the routine. From the perspective of visible thinking, this suggests that, in Early Years Education, the aim should not be to expect fully developed answers; rather, it should consist of creating conditions to support the cognitive journey that pupils embark upon when they engage in thinking processes (Ritchhart, 2015, 2023; Ritchhart et al., 2014). At an early age, such thinking may be expressed through partial approaches, visual representations, brief verbalisations and forms of participation that require contextualised interpretation. Therefore, making this thinking visible involves paying attention not only to the final output, but also to the interactions and support that enable the reconstruction of the process followed by the children.

The implications of the study are pedagogical, professional development-related and research-related. From a didactic perspective, the findings suggest the value of integrating LINFs into reading-sequences that incorporate time, language, interaction and feedback as conditions for transforming reading into a shared inquiry experience, avoiding the reduction of reading to the mere transmission of information and encouraging the activation of pupils' prior knowledge, interests and curiosities (Ruiz, 2020). From a professional development perspective, the study highlights the need to support teachers in the intentional use of routines, visual aids and mediation strategies that enable them to sustain children's thinking without unduly directing it. From a research perspective, it contributes to exploring the relationship between LINF, visible thinking and a culture of thinking within a real-world context of Early Years Education.

Among the limitations, it is worth noting that the study was conducted in a single school and with a small number of groups; therefore, the findings must be interpreted within the framework of the transferability inherent to qualitative research, rather than through statistical generalisation. Furthermore, as this was a collaborative action research project, the evidence was influenced by the teachers' decisions, classroom dynamics and the methods of recording used. Consideration must also be given to the complexity of interpreting children's drawings and verbal expressions, particularly at an early age, when thought is not always expressed explicitly or in a verbally elaborate manner. Future

research could extend the study to other schools and contexts of reading mediation, such as libraries, and analyse in greater depth the longitudinal development of thought processes in early childhood.

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