



FROM INCLUSIVE READING TO INCLUSIVE MEANING-MAKING: BODILY INCLUSION THROUGH MULTIMODAL, TACTILE, AND INTERACTIVE PICTURE BOOKS FOR LEARNERS WITH DIVERSE NEEDS

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Abstract:

Contemporary perspectives on early literacy increasingly view reading as a multimodal process of meaning-making that extends beyond print recognition and decoding. This paper examines multisensory and interactive picture books as inclusive literacy environments that support participation by autistic children, children with diverse communication profiles, and typically developing peers. Drawing on emergent literacy, New Literacy Studies, multimodality, material literacy, embodied cognition, and Universal Design for Learning (UDL), it explores how tactile, interactive, auditory, and visual features contribute to children's engagement with narrative. Rather than treating sensory elements as supplementary adaptations, the paper argues that they function as integral components of storytelling, enabling multiple pathways for meaning-making through touch, movement, gesture, gaze, sound, and spoken language. Using examples of contemporary picture books, it identifies educational principles that promote inclusive storytelling, including meaningful integration of sensory features, opportunities for child-directed exploration, emotional engagement, and flexible modes of participation. It concludes that multisensory picture books create shared literacy experiences that accommodate diverse ways of learning, communicating, and constructing meaning.

Keywords: multisensory picture books; inclusive literacy; autistic learners; diverse communication profiles; embodied literacy

1. Introduction

For much of the twentieth century, early reading was largely associated with the acquisition of print-based skills. Learning to recognize letters, decode written words, and comprehend texts came to define what it meant to become literate. Although these

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competencies remain fundamental aspects of literacy development, they represent only one dimension of children's early encounters with literacy. Research over the past four decades has consistently demonstrated that literacy begins long before formal instruction and develops through children's participation in meaningful communicative practices within everyday social contexts (Teale & Sulzby, 1986; Whitehurst & Lonigan, 1998; Neuman & Dickinson, 2001).

From an emergent literacy perspective, young children are immersed in literacy from infancy. Shared book reading, family conversations, songs, play, drawing, storytelling, gesture, and everyday routines all contribute to the development of children's understandings of language, symbols, and communication. These experiences are not merely preparatory activities that precede "real" reading; rather, they constitute the contexts through which children learn how texts function, how stories are organized, and how meanings are constructed collaboratively. Literacy therefore develops through participation, interaction, and engagement rather than through the sequential accumulation of isolated skills.

This broader understanding of literacy has been reinforced by perspectives from the New Literacy Studies, which challenged the assumption that literacy can be reduced to a universal set of cognitive abilities. Street's (1984) distinction between the autonomous and ideological models of literacy remains particularly influential in this field. While the autonomous model positions literacy as a neutral technical competence whose effects are largely independent of social context, the ideological model understands literacy as embedded within the cultural, social, and historical practices through which people communicate and interpret their worlds. Reading and writing are therefore inseparable from the communities, relationships, values, and institutions in which they are practiced.

Building on these ideas, Barton and Hamilton (1998) shifted attention from literacy as an individual cognitive skill to literacy as a set of social practices shaped by everyday contexts. That means that literacy is understood through what people do with texts in everyday social and cultural contexts rather than through what they know about print alone. Similarly, Gee (2015) argues that literacy cannot be understood separately from the social practices through which language acquires meaning. From this perspective, becoming literate involves learning to participate in culturally organized ways of communicating, interpreting, and representing experience rather than simply mastering the technical aspects of written language.

Such perspectives are particularly significant in early childhood education because children enter educational settings with diverse histories of communication and meaning-making. Long before formal literacy instruction, children participate in storytelling, pretend play, drawing, movement, observation, gesture, and other symbolic practices. These experiences influence how children approach books, respond to narratives, and engage with literacy in educational contexts. Rather than viewing children as pre-literate learners waiting to acquire literacy, this perspective recognizes that children already possess rich communicative resources that become foundations for later literacy development (Street, 2003).

Understanding literacy as participation also reshapes approaches to inclusion. If literacy emerges through social interaction and multiple forms of communication, then inclusive literacy practice cannot be limited to providing equal access to the same activities or materials. Instead, it requires recognition of the diverse ways children participate, communicate, attend, and contribute to shared meaning-making experiences. Booth and Ainscow (2011) argue that inclusion involves the continuous identification and removal of barriers to participation, while emphasizes the importance of learning environments where diversity is understood as a resource rather than as a difficulty to be accommodated (Ainscow, 2020). Florian (2015) conceptualizes inclusive pedagogy as an approach that extends learning opportunities for all children by recognizing learner diversity and avoiding practices that marginalize or separate individuals.

This perspective is particularly relevant for autistic children and children with diverse communication profiles, whose engagement with literacy may not always follow conventional patterns based on verbal response, sustained visual attention, or print-focused interaction. Children may demonstrate understanding through gesture, gaze, movement, repetition, sensory exploration, emotional responses, or interaction with material features of texts. Recognizing these forms of engagement expands definitions of literacy participation and challenges narrow assumptions about what reading looks like.

These theoretical perspectives provide the foundation for reconsidering picture books as more than linguistic and visual texts. If literacy develops through participation in socially and materially situated practices, then children's encounters with books must also be understood through the sensory, embodied, and interactive experiences that shape meaning-making. Contemporary approaches to multimodality and material literacy emphasize that meaning is produced through the interaction of multiple modes, including image, language, sound, touch, movement, and the physical properties of texts (Kress, 2010; Mangen & van der Weel, 2016). From this perspective, the picture book is not simply a container of words and images but a material and social environment in which children actively construct meaning.

Therefore, the aim of this paper is to explore how multisensory and interactive picture books function as inclusive literacy environments for autistic children and children with diverse communication profiles. Drawing on perspectives from New Literacy Studies, multimodality, material literacy, embodied learning, and Universal Design for Learning (UDL), the paper examines how tactile, interactive, and auditory features create multiple pathways into storytelling and literacy participation. Rather than viewing sensory elements as adaptations added for specific groups of children, this paper argues that multisensory design can enrich literacy experiences for all learners by expanding the ways children encounter, interpret, and communicate meaning.

The selected books are not considered valuable simply because they invite touch, movement, or sound; they are examined as literary experiences in which material features support narrative understanding, emotional engagement, and communication.

The criteria for selecting the specific multisensory and interactive picture books was:

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- Integration of sensory and interactive features with a coherent, meaningful story
 - Clear narrative structure with characters, events, and opportunities for prediction and comprehension
 - Balance between sensory exploration and literary quality
 - Opportunities for multiple forms of communication, participation, and response
 - Connection between story experiences and children's emotions, everyday lives, and social understanding
 - Accessibility and inclusivity through multiple pathways for meaning-making

Through these criteria, the paper positions multisensory picture books as inclusive spaces where different children can participate in literacy according to their own strengths and modes of communication.

2. From Print-Centered Literacy to Multimodal Meaning-Making

The recognition that literacy is socially situated has also challenged assumptions about the forms through which meaning is produced. Traditional models of early literacy have often privileged written language as the primary medium through which children demonstrate understanding. While print remains central to literacy education, children's everyday communicative practices reveal that meaning is rarely constructed through language alone. From the earliest years of life, children draw upon multiple semiotic resources, including gesture, movement, facial expression, sound, visual representation, play, and interaction with objects and other people. Children observe facial expressions, respond to images, anticipate events, repeat familiar phrases, manipulate objects, and use their bodies to participate in narratives. These practices are not peripheral to literacy development; they represent fundamental ways through which children construct relationships with texts.

Kress (2010) further developed this perspective by arguing that communication involves the selection and combination of available semiotic resources according to the purposes and contexts of meaning-making. Meaning is therefore not simply transmitted from author to reader but produced through interaction between individuals, signs, and environments. Within early childhood education, this view positions children as active participants who interpret, transform, and recreate meanings through the resources available to them.

Cope and Kalantzis (2000, 2015) extended this argument through the notion of learners as designers of meaning. This concept is particularly relevant to early childhood contexts because young children are not merely consumers of texts. They engage with stories creatively by predicting possibilities, making connections, changing narratives through play, and representing ideas through different modes. A child who retells a story through drawing, dramatic play, gesture, or movement is not demonstrating a secondary form of literacy; rather, the child is engaging in a different mode of meaning construction. Malafouris (2013) argues that human thinking emerges through interactions between

minds, bodies, and material environments, highlighting the active role of objects in shaping cognition and meaning-making.

This reconceptualization of literacy has important consequences for how educators understand participation. If literacy is produced through multiple modes, then children's competence cannot be measured exclusively through verbal explanation, print-related knowledge, or conventional responses to texts. Some children may demonstrate deep engagement through visual attention, physical interaction, repetition, sensory exploration, or imaginative transformation. Recognizing these forms of participation requires educators to attend not only to what children communicate but also to the varied ways through which communication occurs.

Universal Design for Learning (UDL) offers a complementary framework for thinking about such possibilities within educational environments. Rather than designing learning experiences around an assumed “typical” learner and subsequently adapting them for children who experience barriers, UDL proposes that accessibility should be considered from the outset through multiple means of engagement, representation, and expression (CAST, 2018). In early childhood literacy contexts, this involves creating environments where children can encounter texts through different sensory, linguistic, and interactive pathways.

Such an approach does not suggest lowering expectations or replacing conventional literacy practices. Rather, it challenges the assumption that there is only one legitimate route towards literacy participation. A child's engagement with a book through touch, movement, visual exploration, or interaction with another reader represents a form of meaning-making that deserves recognition within the literacy environment.

This shift becomes particularly relevant when considering the role of picture books in early childhood classrooms. Picture books have traditionally occupied an important place in children's literacy experiences, yet they are often still approached primarily as vehicles for introducing vocabulary, narrative structure, or print awareness. While these functions remain significant, contemporary scholarship has demonstrated that picture books operate as complex multimodal artefacts in which meaning emerges through the relationship between words, images, design, and material form.

3. Picturebooks as Multimodal and Material Texts

The changing conceptualization of literacy has contributed to a parallel rethinking of the picture book itself. Rather than being regarded as a literary form in which illustrations simply support written language, the contemporary picture book is increasingly understood as a complex multimodal text in which meaning is produced through the interaction of multiple elements. Words, images, page layout, typography, color, framing, sequencing, and material features work together to shape the reader's experience (Nikolajeva & Scott, 2001; Kress, 2010; Serafini, 2014).

This understanding challenges the assumption that the verbal narrative represents the primary source of meaning while visual and material elements function as supplementary features. In picture books, meaning is constructed through the dynamic interplay between written language, visual representation, and other semiotic resources that contribute to children's interpretation of texts (Unsworth, 2009). Illustrations may extend, complicate, or even contradict the written narrative, requiring readers to interpret connections between different modes of representation. Young children engaging with picture books are therefore involved in sophisticated interpretive processes as they attend to visual details, infer relationships between characters, anticipate events, and construct meanings across the interaction of image and text.

Nikolajeva and Scott's (2001) analysis of the picture book as a multimodal form highlighted the dynamic relationship between verbal and visual narratives. Their work demonstrated that picture books invite readers to negotiate meanings across two distinct but interconnected systems. This interaction creates interpretive possibilities that are particularly significant for young children, whose developing literacy practices often involve close attention to visual information, emotional expression, and contextual clues.

The material dimension of picture books further expands this understanding. A book is not simply a container for narrative content; it is an object that structures how readers encounter and interact with stories. The size of a book, the texture of its pages, the arrangement of images, the movement required to turn pages, and the presence of interactive features all influence the reading experience. Research on materiality in literacy has emphasized that texts are experienced through embodied encounters rather than through abstract cognitive processing alone (Mangen & van der Weel, 2016; Kümmerling-Meibauer, 2015).

This is particularly evident in books designed for younger children, where physical engagement is frequently integrated into the reading process. Lift-the-flap books, touch-and-feel books, movable elements, die-cut pages, textured surfaces, and sound components invite children to explore the book through action. The child does not encounter the story only through interpretation of symbols but through manipulation, anticipation, repetition, and sensory engagement. Turning a page, revealing a hidden image, tracing a texture, or activating a sound becomes part of how the narrative is experienced. Tomchek and Dunn (2007) examined sensory processing patterns in children with and without autism, highlighting differences in how children respond to and organize sensory information from their environments. Their findings emphasize that sensory experiences can influence children's attention, engagement, and participation in everyday activities. Within early literacy contexts, this perspective is particularly relevant because multisensory picture books provide opportunities for children to interact with stories through touch, movement, sound, and visual exploration. For autistic children, carefully designed sensory features may offer alternative pathways for engagement and communication, allowing them to participate in shared reading according to their individual sensory preferences and responses. At the same time, sensory-rich experiences can support all children by encouraging exploration, descriptive

language, attention, and deeper connections between physical experience and meaning-making. Thus, understanding sensory processing contributes to the design of inclusive literacy environments that recognize diverse ways of experiencing and responding to texts.

Such forms of interaction are often considered features of early childhood publishing, yet they also raise broader theoretical questions about what counts as reading. If reading is understood as the construction of meaning through engagement with texts, then physical interaction with a book is not separate from literacy activity. The sensory and material dimensions of the text become part of the interpretive process itself.

This perspective is particularly relevant for understanding the literacy experiences of children whose engagement with texts may not primarily follow conventional verbal or print-based pathways. For autistic children and children with diverse communication profiles, access to meaning may involve forms of attention, interaction, and expression that extend beyond spoken language. Sensory responses, visual orientation, gesture, movement, repetition, and interaction with objects can represent significant ways of participating in shared literacy experiences.

Recent perspectives informed by neurodiversity have questioned approaches that interpret differences in communication and interaction primarily through a deficit framework. Rather than viewing autistic ways of engaging with the world as incomplete versions of typical development, neurodiversity-informed approaches emphasize variation in communication, perception, attention, and sensory experience as part of human diversity (Milton, 2012; Kapp, 2020). This shift has implications for literacy education because it invites educators to recognize that participation may be expressed through multiple forms, including those that are not immediately visible within traditional classroom expectations.

For some children, a meaningful response to a story may not involve answering questions about characters or verbally retelling events. Engagement may instead be demonstrated through sustained visual attention to particular images, repeated interaction with a favorite page, exploration of tactile elements, physical movement during storytelling, or shared attention with an adult around a particular feature of the book. These actions should not be interpreted as peripheral to reading; they represent forms of interaction through which children establish relationships with texts.

The concept of embodied cognition provides a useful theoretical foundation for understanding these forms of engagement. Varela, Thompson, and Rosch (1991) challenged perspectives that positioned cognition as separate from bodily experience, arguing that knowledge emerges through the interaction between perception, action, and environment. From this perspective, learning is not confined to internal mental processes but develops through embodied encounters with people, objects, and spaces.

Merleau-Ponty's (1962) phenomenological account similarly emphasized the central role of the body in human experience. The body is not merely a physical instrument controlled by the mind; rather, it is through the body that individuals perceive, interpret, and participate in the world. Within early childhood literacy, this

perspective provides a basis for understanding why touching, moving, manipulating, listening, and visually exploring texts are meaningful components of reading experiences.

Sensory picture books therefore offer an important site for examining literacy beyond conventional boundaries. Their significance does not lie only in their potential usefulness for children who experience barriers within print-centered approaches. Rather, they reveal broader possibilities for understanding literacy as an embodied, social, and multimodal practice. When children engage with books through multiple sensory pathways, they demonstrate that reading is not a single mode of activity but a diverse set of practices through which meaning is encountered, negotiated, and shared.

3. Multimodal Picturebooks as Inclusive Sensory Environments for Autistic Learners and Children with Diverse Communication Profiles

3.1 Tactile Picture Books: Reading Through Touch, Movement, and Sensory Exploration

Tactile picture books expand conventional understandings of reading by foregrounding the role of touch and material experience in the construction of meaning. Rather than treating sensory features as supplementary additions to a primarily visual text, these books position the physical qualities of the page as part of the narrative encounter. Textures, contrasts, and opportunities for manipulation invite children to explore relationships between sensation, language, image, and experience. Reading, in this context, involves not only looking at and listening to a story but also physically engaging with the material form through which the story is presented.

The *That's Not My...* series by Fiona Watt and Rachel Wells demonstrates how tactile design can support early literacy through repetition and sensory exploration. In *That's Not My Flamingo*, familiar sentence patterns are combined with contrasting textures, including rough, smooth, shiny, and soft surfaces. As children move through the pages, they encounter repeated language while simultaneously comparing sensory information. The meaning of the book emerges through the interaction between verbal prediction, visual recognition, and tactile discovery.

For autistic children and children with diverse communication profiles, the predictable organization of the series may provide a supportive structure for participation. Repetition, familiar sequences, and opportunities to explore preferred sensory features allow children to engage with the book according to their own patterns of attention and response. A child who repeatedly touches a particular surface, returns to a favorite page, or communicates interest through gesture, gaze, or movement is not engaging with only a physical object; these actions represent ways of attending to and making meaning from the narrative. The tactile dimension provides an additional route through which connection with the story can develop.

At the same time, these features create important learning opportunities for typically developing children. The contrast between textures encourages descriptive

language, comparison, prediction, and conversation during shared reading. Children may discuss how surfaces feel, anticipate repeated phrases, and connect sensory experiences with visual representations. The tactile element therefore supports language development and imaginative engagement while encouraging children to become attentive observers of the material world.

A similar relationship between sensory exploration and narrative participation appears in Rosie Greening's *Never Touch...* series. The playful contradiction between the instruction in the title and the child's desire to explore the pages creates a form of interaction that is both physical and linguistic. For autistic children, the repeated structure and predictable sensory experiences may support familiarity and sustained engagement, while for other children the same features encourage curiosity, humor, vocabulary development, and playful experimentation. In both cases, touch becomes part of the literacy event rather than an activity separate from reading.

These examples reflect Pahl and Rowsell's (2010) argument that literacy practices are mediated through material objects and social relationships. The book is not simply a container of words; it is an artefact that shapes how children encounter, interpret, and communicate meanings. Tactile picture books demonstrate that early literacy develops through interactions among bodies, materials, language, and shared experiences.

3.2 Interactive Picture Books: Lift-the-Flap, Slide-the-Window, and Participatory Reading

Interactive picture books further challenge print-centered definitions of reading by incorporating physical action into the construction of narrative meaning. Features such as lift-the-flap mechanisms, sliding elements, pull-tabs, and movable parts require children to act upon the book in order to reveal information. The story is therefore not simply presented to the reader; it unfolds through a relationship between the child's actions and the material structure of the text.

This approach corresponds with material perspectives on literacy, which emphasize that reading involves encounters between readers, objects, and environments (Mangen & van der Weel, 2016). Manipulating a page, revealing a hidden image, or changing the visual arrangement of a scene connects bodily movement with interpretation. Such experiences also align with embodied theories of cognition, which understand learning as emerging through the relationship between perception, action, and the surrounding world (Merleau-Ponty, 1962; Varela, Thompson, & Rosch, 1991).

Eric Hill's *Where's Spot?* provides an early and influential example of interactive storytelling. Throughout the book, children participate in searching for the hidden puppy by lifting flaps and discovering what lies behind each one. The repeated question structure creates anticipation, while the physical act of opening the flaps transforms the child from an observer into a participant in the narrative process.

For some autistic children, the repeated search routine can create a sense of familiarity, making it easier to remain engaged with the unfolding story while controlling the pace of participation. A child may choose to revisit particular flaps, focus on specific

images, or participate through pointing, movement, or shared attention with an adult. These forms of engagement demonstrate understanding through action rather than requiring immediate verbal explanation.

For typically developing toddlers, the same interactive structure supports emerging narrative skills, problem-solving, memory, and social communication. Children predict where Spot may be hiding, discuss possibilities, and share the excitement of discovery with others. The interactive element encourages dialogue and collaboration, transforming reading into a shared social activity. Whitehurst et al. (1988) demonstrated that shared picture book reading significantly accelerates young children's language development through increased exposure to vocabulary and interactive communication.

Cocoretto's *Getting Ready* similarly connects interactive design with children's everyday experiences. Through familiar routines, lift-the-flap features, and a functional zipper element, the book invites children to relate the actions represented in the story to their own lives. For autistic children, familiar routines may create a recognizable framework for participation, while the ability to manipulate the book provides opportunities for independent exploration. For other children, the same features support understanding of daily sequences, symbolic play, and language associated with everyday activities.

Ingela P. Arrhenius' *Where's Mr Lion?* extends this interactive tradition through felt flaps and a final mirror surprise. The process of searching for hidden animals encourages attention, prediction, and shared enjoyment. Children who communicate differently may participate through repeated exploration, visual attention, or physical interaction, while other children may focus on naming animals, anticipating outcomes, and discussing emotions associated with the discovery. The same material feature therefore supports multiple forms of literacy participation.

Hervé Tullet's *Press here* offers another perspective on interactive reading by making the child's actions central to the transformation of the narrative. Pressing, tilting, and moving the pages creates visible changes within the book, demonstrating that meaning can be produced through interaction. Such books highlight the possibility of reading as a collaborative process between child and text.

3.3 Sound, Rhythm, and Multisensory Story Engagement

Sound provides another important resource through which children engage with picture books. Auditory elements, rhythmic language, and interactive sounds extend the reading experience beyond the visual page, allowing children to encounter stories through listening, anticipation, and repetition. In multisensory books, sound is not merely an entertaining addition; it contributes to the atmosphere and interpretation of the narrative. *Night Sounds* by Federica Lossa and Sam Taplin illustrates how auditory features can become part of storytelling. Through sound buttons, finger trails, and visual openings, children explore a nighttime environment through several sensory channels. Sounds of

animals, weather, and surroundings contribute to the construction of the story world, helping children connect auditory experiences with images and concepts.

For autistic children, auditory features may provide alternative ways of participating in shared reading, particularly when engagement occurs through listening, repetition, rhythm, or anticipation. Some children may respond to familiar sounds, repeated sequences, or particular auditory patterns as ways of connecting with the narrative. For typically developing children, these same features support listening skills, vocabulary development, imaginative thinking, and discussions about the relationships between sounds and meanings.

Eric Carle's *The Very Busy Spider* demonstrates how tactile, visual, and linguistic resources can operate together. The raised texture of the spider's web invites children to explore the page physically, while the repetitive structure of the text supports prediction and participation. Autistic children may engage through repeated interaction with the tactile element or the rhythm of the story, while other children may focus on sequencing events, recalling phrases, and discussing the character's actions.

4. Conclusion: Towards an Inclusive Understanding of Reading

Across tactile, interactive, and sensory picture books, the boundaries of early reading are expanded beyond visual decoding and verbal response. These books demonstrate that children participate in literacy through multiple forms of engagement, including touching, listening, moving, observing, repeating, predicting, and interacting with others.

For autistic children and children with diverse communication profiles, multimodal picture books create possibilities for participation that recognize different patterns of attention, communication, and sensory engagement. These possibilities reflect the principles of Universal Design for Learning (CAST, 2018), which emphasize the importance of multiple means of engagement, representation, and expression.

Future research is needed to examine how children engage with different types of multisensory picture books in everyday educational settings. Particular attention could be given to the ways tactile, interactive, and auditory features influence children's understanding of stories, communication, peer interaction, and emotional responses. Studies conducted in classrooms over extended periods of time would provide valuable insights into how autistic and typically developing children participate in shared reading experiences and how these interactions evolve. Further research could also explore which design features most effectively support meaningful participation and inclusive literacy experiences, contributing to a stronger evidence base for both educators and picture book creators.

Inclusion is not a simple process of placing diverse learners within the same educational environment; rather, it requires a continuous transformation of practices, attitudes, and structures to ensure meaningful participation for all children. Booth (2011) emphasizes that inclusion requires translating inclusive values into everyday educational

practices that promote participation, equality, and belonging. Allan (2012) argues that inclusion involves challenging and removing structural and cultural barriers that restrict learners' opportunities to participate, while Armstrong, Armstrong, and Spandagou (2011) emphasize that inclusion is a deliberate educational commitment shaped by values, choices, and practices that promote belonging and participation. From this perspective, inclusive education requires recognition of the different ways children communicate, engage, and construct meaning rather than expecting all learners to follow a single pathway. Within early literacy contexts, multisensory picture books contribute to this inclusive goal by creating shared spaces where children can participate through multiple modes, including touch, movement, sound, images, language, and interaction. Rather than functioning as specialized resources for particular groups, these books support environments in which autistic children and typically developing children can engage together, each drawing on their own strengths and ways of making meaning.

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Conflict of Interest Statement

The author declares no conflicts of interest.

About the Author

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conferences and has contributed to academic publications on children's literature, literacy education, and educational innovation. Alongside her academic work, Dr. Kaliakatsou Ioanna has extensive experience in teacher education and curriculum development and is actively engaged in initiatives that promote inclusive education and community participation. Her current research continues to investigate multisensory picture books, visual meaning-making, and the educational potential of multimodal storytelling in fostering literacy, communication, and social inclusion for all children.

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