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RESEARCH BOOKLET

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Continuity-Centered Educational Tool for Children

Designing educational kits for early-primary-school children to teach them a second language while balancing learning continuity between home and school

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Dipartimento Pianificazione, Design, Tecnologie dell'architettura
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Title:

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Abstract

The current research explores how Italian children aged six to eight experience early English learning across the two life-environments that feature as everyday contexts: the classroom and the home. Building on the insights of developmental psychology, second-language acquisition theory, and embodied cognition research, this study shows that young learners do not experience English as a seamless process but rather as a fragmented sequence of episodes characterized by sharply contrasting emotional climates, activity structures, material resources, and adult mediation. By means of naturalistic observation, informal conversations with parents and teachers, and an extensive benchmarking of existing educational tools, five interdependent discontinuities—cognitive, emotional, material, mediational, and narrative—are highlighted that upset the children's learning and hinder them from achieving lasting meaning.

These results indicated that children naturally try to create coherence by externalizing the language through gesture, manipulation, drawing, and spontaneous storytelling, but that these strategies were unsupported by existing resources. Adults, in turn, navigate divergent constraints: teachers manage curricular pacing and group dynamics while parents rely on improvisation and intuition. Existing ESL tools rarely address these ecological realities, offering either rigid instructional formats or unstructured play, with little attention to continuity across contexts.

The study concludes that for truly effective early English learning, there is a need for a continuity-centered design approach consonant with the children's developmental profiles; one that reduces anxiety by way of narrative safety, allows for embodied meaning-making, and provides stable and portable materials along with intuitive cues for the adults. An ecological perspective frames the basis of the design phase of the thesis in proposing a tangible, narrative-based educational kit that can bridge fragmented learning environments at home and school and support children in building a coherent, emotionally safe, and developmentally grounded relationship with English as their second language.

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CHAPTER 01

INTRODUCTION AND POSITIONING

01. INTRODUCTION AND POSITIONING

1.1 Context and orientation of Research

Italian primary education introduces English into a setting where children reach new levels of structure, evaluation, and symbolic learning. Ages 6–8 are a transitional phase during which children move between the comfort of familiar emotions at home and the formal expectations of the classroom, carrying with them early impressions of what it means to learn a second language. The discontinuities that arise in this movement—differences in tone, materials, pacing, and adult mediation—shape the way children interpret English as either an opportunity for playful expression or a source of anxiety and fragmentation.

Contemporary research on early childhood learning has emphasized how experiences in the early years are enacted across distributed landscapes, rather than in discrete spaces (Bronfenbrenner, 1979). Through repeated contact with the rhythms, objects, and adults whose approaches may blend or clash, young children develop their sense of the world. Where the structures that govern English differ substantially between home and school, the child must work out not only the linguistic substance but also the changing expectations entailed in each context.

Within this landscape, Product and Service Design offers tools toward understanding and intervening in experiential dimensions of learning. This thesis places design as one way to realign the environments, artifacts, and interactions that form early English learning by constructing a pathway supporting continuity, emotional safety, and agency.

1.2 The Problem of Fragmented Early English Learning

The discontinuity between home and school was echoed throughout the observations, interviews, and existing literature. Teachers are bound by inflexible time constraints, pacing of curriculum, and the press of group management. Parents try to reinforce learning with whatever materials are available—apps, flashcards, makeshift games—often without understanding classroom practices or developmental requirements.

These parallel efforts rarely converge. Instead, they yield:

- Divergent material ecologies: School relies on workbooks and verbal instruction; Home relies on improvised or digital materials with limited pedagogical grounding.
- Inconsistent emotional climates: classroom performance anxiety runs in opposition to the informality of home, therefore creating inconsistent associations with English (MacIntyre & Gardner, 1994).
- Gaps in mediation: teachers scaffold activities through pedagogical strategies, but parents rely on intuition or their own experience, which often leads to mismatched expectations.
- Discontinuities: cues, rituals, and routines do not transfer with the child, making transfer of learning between contexts less likely to occur (Rogoff, 2003).

Such patterns indicate that the issues in early English learning are not restricted to language only but extend to psychological, relational, and material discontinuities.

1.3 Aim and Direction of the Research

This study aims to explore how design can support a coherent experience in English learning for 6–8-year-old children by developing an educational kit that works coherently within both home and classroom contexts.

This requires understanding:

- how children in this age band engage with tangible, narrative and embodied materials;
- how emotional and cognitive dynamics influence their willingness to participate;
- how teachers and parents mediate language activities;
- how existing systems succeed or fail in their support for continuity;
- How does design consolidate the insights into requirements for a new tool?

The project, therefore, integrates insights from developmental psychology, L2 pedagogy, design research, and field observations to construct a grounded foundation for a tangible educational kit and its didactic plan.

1.4 Research Questions

The study is guided by the following questions that emerged from field observations and literature review:

- RQ1. How do children experience and interpret early English learning across the home and classroom environments?
- RQ2. How is participation and continuity shaped by differences in emotional tone, materials, and adult mediation?
- RQ3. What tangible and narrative-based approaches align with the development characteristics of 6–8-year-olds to reduce anxiety and support engagement?
- RQ4. How might one kit design maintain coherence across contexts while being accessible to teachers and families?
- RQ5. What are the measurable indicators of continuity, emotional safety, and usability in early English learning?

These questions frame the empirical and theoretical movement of research.

1.5 Scope and Boundaries

This research focuses on:

- Age group: 6–8 year olds, at the start of primary school.
- Domain: English as a second language—A1, Italian context.
- Medium: tangible, narrative-based, screen-light materials.
- Contexts: Home and classroom learning environments.

It does not try to change national curricula, measure long-term literacy attainment, or introduce heavy digital infrastructure. Rather, it focuses on experiential quality, continuity of practice, and the contribution of material design to early learning.

1.6 Contribution to Design and Education

The study contributes to design, illustrating how a continuity-centered, child-sensitive, narrative-tangible approach can redesign early educational experiences. It contributes to education by providing a design framework that coherently aligns emotional safety, developmental needs, and multimodal engagement into an integrated system.

CHAPTER 02

METHODOLOGICAL FRAMEWORK

02. METHODOLOGICAL FRAMEWORK

2.1 Orientation of the Methodological Approach

The methodological structure developed organically from the tensions surfaced in Chapter 1. The disjunction between home and school revealed that early English learning cannot be confined to pedagogical considerations alone but must be understood as a broader relational, material, and emotional system. Observations of children, teachers, and families underscored that learning emerges through interactions with physical and social environments, recurring routines, affective tones, and the presence or absence of particular artifacts, rather than through isolated instructional acts. Grasping the dynamics of this system required a methodological approach grounded in lived practice—an approach that could attend to the fluidity of real-world experience while generating insights capable of informing design interventions.

To meet this need, the research weaves together Human-Centered Design, People-Centered Design, and Research-through-Design into a unified structure. Each of these methodologies responds to distinct yet interrelated dimensions of the field realities encountered. In combination, they allow for a dual focus: documenting how existing tools and routines are engaged by children and adults, and exploring the new possibilities that unfold when alternate materials and learning structures are introduced. The chapter, therefore, does not treat methodological frameworks as external or abstract, but rather as internally consistent with the logic of inquiry that has guided the research from the outset.

2.2 Human-Centered and People-Centered Foundations

Initial observations of early English instruction quickly revealed that children's engagement with language tasks cannot be separated from their cognitive and emotional states. Children aged six to eight encounter such tasks through the lens of their developing attention spans, heightened sensitivity to correction, and an emergent desire for personal agency. These patterns resonate with developmental theories that emphasize the fundamental interplay between emotional experience, cognitive processes, and the construction of meaning (Immordino-Yang & Damasio, 2007). Within this context, Human-Centered Design serves as the primary methodological anchor, providing a lens through which the research attends to children's interactions with materials, with sequences of instruction, and with the overall structuring of activities. Particular attention is paid to how these components either facilitate or inhibit the child's willingness and capacity to participate.

However, children's learning is never a solitary endeavor. Their experience of English is invariably mediated by adults—whether parents, teachers, or caregivers—who serve not only as models for language use but also as regulators of emotional tone and facilitators of task engagement. Conversations with these adults, particularly those captured through informal exchanges and semi-structured interviews, revealed marked divergences in expectations, levels of preparedness, and understandings of learning. These tensions reflect the relational orientation of ecological and socio-cultural theories of learning (Rogoff, 2003; Bronfenbrenner, 1979), which stress that meaning-making is situated within webs of interaction and shared practice. In light of this, People-Centered Design becomes equally essential. It directs attention to the enabling—or disabling—role of adult figures and the environments they help to construct.

02. METHODOLOGICAL FRAMEWORK

Continuity, it becomes clear, is not only about what children attempt or achieve, but equally about what adults are structurally and emotionally able to support.

Taken together, Human-Centered Design and People-Centered Design shape an interpretive approach that keeps the child at the center of the inquiry, while simultaneously foregrounding the distributed nature of learning. This dual orientation allows for a more nuanced understanding of how routines, relationships, and material affordances co-produce the child's experience of early English.

2.3 Researcher Positioning within the Inquiry

The conduct of the research was informed by a dual stance that emerged naturally over the course of the inquiry: the researcher as observer, and the researcher as designer. From the observer position, the focus was on documenting children's behavior within natural contexts, attending to how they responded to tasks, interacted with materials, and navigated the implicit or explicit structures set by adults. This extended to the observation of adult mediation strategies, classroom dynamics, and the handling of emotional cues. The approach aligns with qualitative research traditions in education that prioritize contextual understanding and situated knowledge over controlled or decontextualized measurement (Merriam & Tisdell, 2016). Through this lens, it became possible to discern subtle yet telling patterns —moments of hesitation, gestures that signaled comprehension or resistance, tonal shifts, and brief but meaningful displays of confidence.

At the same time, the role of the researcher as designer activated when such patterns called for more than descriptive interpretation. It was through sketching, scenario building, and low-fidelity prototyping that hypotheses could be explored, implicit constraints surfaced, and new affordances tested. This mode of generative inquiry aligns with the tradition of Research-through-Design, where knowledge does not merely emerge from analysis, but from iterative making and reflective engagement with evolving design proposals (Zimmerman et al., 2007). The two roles were never held in isolation. Rather, they informed and deepened one another. Observations clarified what demanded closer attention or change; design actions exposed possibilities that were otherwise invisible in the act of watching alone.

2.4 Data Types and Ethical Alignment

The research trajectory was structured through four principal data types, each contributing a distinct layer to the unfolding inquiry. Theoretical and empirical literature provided grounding across developmental psychology (Pinter, 2011), early second language acquisition, embodied cognition, emotional learning, and studies specific to the Italian educational context. These sources framed the interpretation of field encounters and shaped the potential directions for tangible, narrative-based design interventions. Observational data, gathered in both classroom and home settings, focused on the flow of activity, shifts in emotional expression, fluctuations in attention, the manipulation of physical materials, and participation across verbal and non-verbal modalities. These data offered a window into how children make sense of English across the discontinuous environments that structure their everyday lives.

Stakeholder input, meanwhile, was gathered through informal and semi-structured conversations with teachers and parents.

These exchanges offered insights into the daily pressures, constraints, pedagogical beliefs, and implicit expectations that govern adult involvement in early English learning. Often, they revealed gaps or mismatches between classroom practices and home-based support strategies—disconnects that bore directly on the child's capacity to navigate between the two worlds. The fourth strand, a benchmarking analysis, involved a systematic review of over ninety existing tools and services ranging from physical learning kits to digital applications. This process allowed for a mapping of dominant design formats, identified points of discontinuity, and highlighted missed opportunities for integrating tangible, inclusive, and low-screen approaches.

Given the central involvement of children throughout the research, ethical alignment remained a priority. No identifiable data were collected at any stage. All observation sessions prioritized behavior over personal narrative, with participation strictly voluntary and framed within environments familiar to the child. Data collection avoided any digital trace, and all prototyping was carried out using age-appropriate, safe, and repairable materials. All research practices adhered to privacy protections in accordance with GDPR-K standards. These considerations were not secondary to the inquiry but were embedded within the very structure of how the research was designed and conducted, ensuring that children's rights, vulnerabilities, and developmental needs were respected throughout.

2.5 Triangulation and Interpretive Consistency

Triangulation within this research was not approached as a formal procedure to satisfy methodological checklists, but as a principled practice aimed at preserving interpretive integrity. Observational insights from both school and home were placed in dialogue with theoretical expectations derived from developmental psychology and second-language acquisition theory. Patterns that emerged in field contexts were tested against stakeholder testimony and design benchmarking, not to eliminate divergence, but to understand it. In this way, triangulation functioned as a way to recognize stability where it existed, while also making space for contextual tension when data did not align.

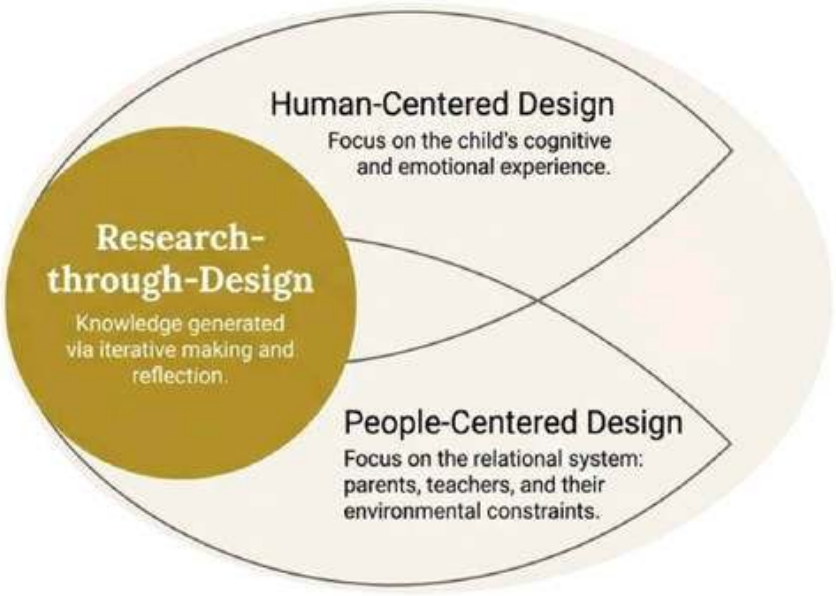
Crucially, insights were only considered robust when they appeared across multiple forms of evidence, reinforcing their salience without relying on repetition alone (Denzin, 2012). Divergences were not treated as inconsistencies to be resolved, but as openings into deeper questions—often pointing toward areas of emotional friction, misaligned expectations, or structural fragmentation that demanded design-level response. This interpretive layering became foundational to the development of requirements in the next phase of the research.

2.6 Validation Logic within Research-through-Design

Validation occurred along two interrelated axes. First, the research foundations were validated through their rootedness in developmental and pedagogical literature, the lived realities captured through field observation, the voices of parents and teachers, and the critical review of existing tools. This grounding ensured that the conceptual base of the project remained in touch with real-world learning environments and experiences.

02. METHODOLOGICAL FRAMEWORK

Second, the emerging design implications underwent a process of formative and iterative validation. Rather than waiting for a final product, early ideas were explored through walkthroughs, prototyping sessions, and reflective comparison with the insights gathered during the observational phase. Alignment with inclusive design principles remained a constant reference point, and where possible, early feedback was sought from teachers and parents. This iterative form of validation was not aimed at achieving universal applicability, but at ensuring that the design propositions held coherence, relevance, and potential for meaningful impact within the specific ecological system studied.



CHAPTER 03

DEVELOPMENTAL FOUNDATIONS

03. DEVELOPMENTAL FOUNDATIONS

3.1 Interpreting Field Patterns Through Cognitive Development

During the initial observations conducted across classroom and home settings, one pattern surfaced with striking consistency: children often oscillated between states of engagement and withdrawal within short intervals. Activities demanding sustained attention faltered quickly, whereas those integrating movement, hands-on manipulation, or narrative framing managed to hold their attention for longer periods. These fluctuations did not indicate instability or inconsistency on the part of the children, but instead revealed a close alignment with the cognitive developmental characteristics typical of their age group.

Children between the ages of six and eight operate within cognitive systems that are expanding yet remain inherently fragile. Their executive functions—including working memory, inhibitory control, and cognitive flexibility—are active but highly susceptible to overload (Diamond, 2013). Consequently, tasks that rely heavily on abstract reasoning or symbolic manipulation, such as rote grammar drills, isolated vocabulary memorization, or repetitive spelling exercises, are frequently interrupted by distraction, hesitation, or avoidance. However, when activities were embedded in tangible or visually anchored cues—such as physical objects, narrative characters, or spatial arrangements—children were better able to maintain cognitive coherence. This observation is supported by research in embodied cognition, which suggests that tangible engagement reduces cognitive load and allows children to externalize abstract concepts that are not yet manageable through internal mental representation alone (Glenberg, 2010). These developmental realities help explain why children observed in the field gravitated instinctively toward physical, story-driven, and action-based engagements with English, and why their participation often faltered during static, workbook-centered exercises.

3.2 Emotional Dynamics: Anxiety, Confidence, and Role Safety

Throughout the fieldwork, emotional factors played a decisive role in shaping children's willingness to engage in English-related tasks. In classroom environments, hesitation was common when children were expected to speak aloud in formats that implicitly emphasized public correctness or evaluative outcomes. Similarly, in the home setting, moments of withdrawal were observed when parents framed tasks as demands for literal repetition, rather than allowing space for open-ended or exploratory responses.

Such behaviors align with established findings that language learning anxiety can emerge even at the earliest stages of development, and that it can sharply limit children's expressive capacity (MacIntyre & Gardner, 1994). During several activities, children demonstrated avoidance through quiet self-correction, hunched posture, reduced eye contact, or outright silence—indicators of heightened emotional self-monitoring. In contrast, clear increases in confidence were noted when children were permitted to assume roles—such as those of characters or puppets—when errors were absorbed into a story rather than marked explicitly, when adults reduced the pressure of evaluative feedback, and when activities enabled symbolic or partial use of language. These dynamics resonate with research emphasizing the importance of narrative and play structures in creating psychologically safe zones where children can experiment without the fear of personal failure (Nicolopoulou, 2014). Emotional safety, therefore, should not be treated as a secondary concern or abstract ideal.

It emerges directly from the observable contrast between performance-driven tasks and those embedded in imaginative, non-judgmental formats.

3.3 Social Participation, Shared Meaning, and Collaborative Learning

Children within the 6–8 age range increasingly rely on shared social practices to construct meaning. Multiple observations in the home context revealed that when parents took overly directive roles—imposing fixed formats or scripted interactions—children often disengaged. However, when the activity was designed to support co-construction, such as allowing the child to select characters, help organize the scenario, or contribute to narrative development, engagement levels rose notably.

This tendency echoes socio-constructivist theories of learning, which stress that knowledge develops through collaborative participation, negotiated meaning-making, and joint scaffolding (Vygotsky, 1978; Rogoff, 2003). At this stage of development, social identity begins to shape how children interpret learning experiences. Group dynamics become central to risk-taking, fairness is negotiated through turn-taking structures, motivation is heightened when goals are shared, and emotional investment increases when narratives are co-created rather than imposed. In classroom contexts, children responded more positively to learning formats structured around predictable social rhythms, such as role assignments, dialogue sequences, or collaborative micro-tasks. Conversely, when the social organization of an activity was ambiguous or incoherent, participation levels dropped. These observations suggest that any design intervention seeking to support English learning at this stage must embed clear, flexible social structures that allow for cooperative meaning-making—without relying on fully developed language skills.

3.4 Embodied, Tangible, and Narrative Tendencies in Children's Learning

A recurring pattern in the field involved children spontaneously translating English content into physical gestures or spatial arrangements. Whether through pointing, miming, organizing physical tokens into sequences, or acting out invented scenes, many children naturally externalized their understanding of language through bodily action. This is strongly aligned with contemporary findings in educational psychology, which show that embodied engagement enhances vocabulary retention, deepens memory encoding, and supports conceptual understanding through physical enactment (Mavilidi et al., 2015).

Children displayed a marked preference for materials that could be physically manipulated; they frequently slipped into narrative roles without prompting, recreated imagined environments with props or found objects, and spoke more fluently when gestures were permitted. These field-based behaviors reinforce the argument that tangible, story-based tools are not only developmentally appropriate but deeply congruent with children's natural modes of engagement. In contrast, workbook-based instruction typically suppresses these tendencies. In several instances noted during observation, worksheets interrupted active imaginative play and resulted in reduced verbal or non-verbal participation.

03. DEVELOPMENTAL FOUNDATIONS

Such evidence reinforces the idea that a truly continuous learning experience—across both home and school—cannot treat embodied and narrative engagement as supplementary. They must be positioned as central mechanisms in early language learning.

3.5 Why These Developmental Insights Matter for Design

The developmental principles outlined in this chapter do not function in isolation from the field context; rather, they offer a lens through which specific behavioral patterns, emotional responses, and learning dynamics observed in children can be understood. More importantly, they shed light on why many existing ESL tools produce discontinuity rather than coherence. For one, children's natural attention rhythms call for learning activities that are modular, brief, and clearly structured. Long-form or repetitive workbook tasks run counter to the cognitive capacities typical of this age group (Diamond, 2013). Secondly, children's willingness to express themselves in English is tightly linked to emotional safety. When tasks are framed around the possibility of making mistakes, participation tends to shrink; when embedded within narrative roles or supported by tangible, playful materials, confidence increases (MacIntyre & Gardner, 1994; Nicolopoulou, 2014).

Furthermore, meaning-making at this age is not a solitary process—it is inherently social and depends on adult scaffolding and peer interaction (Rogoff, 2003; Vygotsky, 1978). Any attempt to support continuity must therefore address the relational dimension explicitly. Embodied and tangible interaction, too, cannot be viewed as a pedagogical add-on. For children in this age group, such engagement is foundational to how they learn. Lastly, the design of learning activities must walk a fine line: offering enough structure to ensure clarity, while also allowing for flexibility that supports autonomy and creative interpretation. Rigid formats reduce agency; unstructured formats risk confusion. The balance is essential to ensure continuity across varied contexts.

These insights form the core developmental grounding upon which the next chapter will build—one that turns specifically toward the particularities of early second-language acquisition within the Italian educational landscape.

CHAPTER 04

EARLY L2 ENGLISH LEARNING IN THE ITALIAN CONTEXT

04.
EARLY L2 ENGLISH LEARNING IN THE ITALIAN CONTEXT

4.1 Interpreting Children's English Learning Through Early L2 Acquisition

Throughout both classroom and home observations, it became evident that children often approached English with a blend of curiosity, hesitancy, and a marked dependence on adult guidance. These responses were not only consistent with the developmental dynamics outlined in the previous chapter but also echoed widely recognized characteristics of early second-language acquisition. Children in the 6–8 age range tend to lean heavily on contextual cues, repetition that is woven into play, and routines grounded in emotional and physical familiarity, rather than abstract grammatical frameworks (Cameron, 2001). At this stage, they do not internalize formal language structures in a systematic way; instead, they gather fragmented pieces of meaning that are anchored in experiences they find emotionally engaging and physically immediate.

Field observations confirmed that English became significantly more accessible to children when vocabulary was attached to tangible objects or embedded within a story, when activities were bodily enacted or organized in physical space, when repetition emerged organically through play rather than structured drills, when children were allowed to adopt roles instead of "performing" English in a formal sense, and when adults scaffolded meaning through gesture, tone, or shared visual reference. These findings resonate strongly with research suggesting that young learners acquire language not through isolated exercises but through socially mediated, multimodal experiences that involve the body, the environment, and meaningful interaction (Pinter, 2011). Conversely, whenever routines in school or home tilted toward abstraction—such as rote repetition, worksheet-driven tasks, or formal testing—children's willingness to participate declined noticeably. This contrast highlights the importance of concrete, emotionally safe, and context-rich encounters in the early stages of L2 development.

4.2 The Italian Primary School Context: Constraints and Practices

English is introduced formally in Italian primary schools at the start of first grade, which immediately places certain structural constraints on how the language can be taught. These limitations became apparent throughout the fieldwork. One of the most immediate challenges is the restricted amount of instructional time. Teachers are often allocated only short, segmented periods for English, which encourages a reliance on quick, efficient formats such as choral repetition or workbook-based exercises (Mazzotta, 2017). Additionally, the pressure to progress through specific curricular units and meet vocabulary targets compresses the available time for narrative, embodied, or exploratory practices.

The size of classroom groups, typically comprising twenty to twenty-five students, further complicates any attempt at improvisation or individualized engagement. Under such conditions, predictable, teacher-led activities become not just common but necessary. Compounding this is a lack of material flexibility. Many classrooms depend heavily on blackboards, photocopies, and standard textbooks, with teachers frequently citing limited access to manipulable resources—often due to budget restrictions, storage limitations, or insufficient training in how to use alternative materials. Beneath these logistical constraints lies a deeper cultural layer: a strong evaluative tradition in which children come to associate learning with correctness, neatness, and performance-based assessment.

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EARLY L2 ENGLISH LEARNING IN THE ITALIAN CONTEXT

This mindset interacts directly with early L2 anxiety, shaping how children perceive and approach English from the very beginning.

The practices observed within these classrooms contrast sharply with the more spontaneous, imaginative, and physically engaged behaviors children displayed when given the opportunity. In particular, the rigid and structured routines of the school context appeared misaligned with the developmental tendencies that children demonstrated in less formal environments—such as embodied exploration, story-driven engagement, role experimentation, and the physical manipulation of language concepts. This mismatch feeds directly into the fragmentation already outlined in earlier chapters, illustrating how environmental constraints limit the possibility for developmental continuity.

4.3 Home Environment Dynamics: Informality, Improvisation, and Uneven Access

Observations within the home setting revealed a different landscape—one that was equally fragmented but shaped by different factors. A central theme was the informality and improvisational nature of most English learning activities. Parents frequently tried to support their children's learning through digital apps, online videos, or homemade games. However, these interventions were uneven in tone, design quality, and pedagogical coherence. Many parents openly expressed uncertainty about how to teach English or how to complement what was happening in the classroom, often defaulting to spontaneous methods rather than structured routines.

Access to materials was also highly uneven. Some households were rich in books, toys, and digital tools, while others had few resources specifically related to English. This discrepancy influenced not just the frequency of exposure, but also the emotional tone of that exposure—determining whether English was experienced as a playful opportunity, a source of stress, or a marginal, peripheral task. Mediation styles varied significantly from one household to another. In some cases, parents adopted exploratory, low-pressure approaches that allowed the child to lead or co-construct activities. In others, they applied a more evaluative lens that mirrored school-based expectations. These shifts in tone produced a range of emotional outcomes, sometimes reinforcing confidence and other times echoing the same hesitations observed in formal settings.

Perhaps most critically, there was a consistent absence of continuity. Materials used in school were rarely seen in the home, and vice versa. The tools, scripts, and routines from each context remained isolated, requiring children to adapt to two separate pedagogical worlds with no shared language, cues, or learning rituals. These dynamics closely reflect findings from research that has shown how parental involvement in early L2 learning is often uncoordinated with formal education structures (Sénéchal & LeFevre, 2002). In sum, the home environment—despite its informality—did not function as a coherent complement to the school. Instead, it contributed a different form of fragmentation, one equally in need of thoughtful design response.

4.4 The Emotional Core of Early L2 Learning

Among all patterns observed during the fieldwork, emotional responses emerged as the most consistent and defining element in children's relationship with English.

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EARLY L2 ENGLISH LEARNING IN THE ITALIAN CONTEXT

Across contexts, the willingness to engage was shaped not just by task structure or materials, but by deeper emotional needs and sensitivities.

Children frequently hesitated in the face of potential mistakes, expressed a desire for clearly defined and safe roles, responded to predictable patterns with greater ease, showed acute sensitivity to adult feedback, and adjusted their behavior based on comparisons with peers.

There was a noticeable divergence in emotional climates between the home and school. Some children who exhibited confidence and creativity during narrative play at home became hesitant or withdrawn in the more structured and evaluative context of the classroom. Conversely, others who followed formal routines with ease in school appeared more reserved or disengaged when learning took on a less directed form at home. This duality reflects broader findings on language anxiety, which can emerge at surprisingly early ages and interfere directly with the cognitive processes involved in language use (MacIntyre & Gardner, 1994).

The implications for design are both urgent and clear. Any meaningful intervention must aim to reduce the emotional threshold required for participation. Narrative structures should offer protective roles that allow linguistic experimentation without fear of failure. Materials need to signal playfulness rather than assessment. And, crucially, adults across both environments must be equipped to maintain a consistent and emotionally safe tone, regardless of the setting. It is this emotional core—rooted not in theory but in the real, embodied experiences of children—that must become a central foundation for the design principles developed later in the thesis.

4.5 Why Italian Early ESL Requires a Continuity-Centered Design Response

When all elements are viewed together—the structural limitations of the school, the variability and improvisation at home, the developmental sensitivities of the learners, and the emotionally charged nature of early language acquisition—a single conclusion becomes inescapable: traditional ESL tools are fundamentally unsuited to support a coherent learning experience across these divided environments. Fragmentation occurs on multiple levels. Cognitively, lessons may contain internal logic, but they do not travel well between contexts. Emotionally, the differing climates of home and school create conflicting associations with the language. Materially, learning tools rarely accompany the child across boundaries or offer consistency over time. In terms of mediation, teachers and parents operate without common scaffolds, while narratively, there is no sustained storyline that the child can inhabit or return to across settings.

These discontinuities echo the theoretical frameworks that emphasize distributed and relational learning systems (Rogoff, 2003; Bronfenbrenner, 1979), while also mirroring the lived challenges documented during fieldwork. The chapter thus builds a case not just for design, but for a design approach grounded in continuity—a response tailored not to a hypothetical learner, but to the actual, emotionally and developmentally situated child navigating English in the Italian educational context. The educational kit that will be introduced in subsequent chapters is not a generic solution, but a direct and necessary answer to these intertwined realities.

CHAPTER 05

LEARNING CONTINUITY ACROSS ENVIRONMENTS

05.
LEARNING CONTINUITY ACROSS ENVIRONMENTS

5.1 Emergence of Continuity as a Central Research Theme

Across both classroom and home environments, one recurring pattern appeared with remarkable regularity: children did not encounter English as a single unified experience. Their participation shifted every time the learning context shifted. In school settings, English typically adopted a structured and performance-oriented tone, framed by curriculum pacing, collective routines, and visible norms around correctness. At home, English unfolded in far more improvised, unstructured, and highly variable ways, often emerging spontaneously through play, media exposure, or informal interaction.

These differences extended beyond the materials in use. They involved the emotional climate surrounding each task, the adult's role, the rhythm of learning, and the expectations surrounding mistakes. Such field patterns resonate with ecological approaches to development, which argue that learning is distributed across multiple overlapping environments rather than functioning as a self-contained activity within a single bounded space (Bronfenbrenner, 1979). As children crossed these environments, they often carried forward confusions, altered expectations, or emotional reservations shaped by previous encounters.

Continuity did not originate as a theoretical premise; it emerged empirically as children navigated and sometimes struggled with the contradictory ways English was taught, mediated, and emotionally framed across environments.

5.2 How Environments Shape Children's Interpretation of English

Classrooms and homes created two distinct experiential worlds in which English took on different meanings and emotional tones. In school, learning was explicitly structured, time was tightly bounded, correctness was emphasized, routines were predictable, activities were collective, and English tended to be "performed" under visible expectations. At home, learning was more spontaneous and open-ended. Parents offered mediation that varied widely, mistakes often passed unnoticed, meaning was negotiated freely, materials differed dramatically, and English was "played with" rather than formally performed.

Developmentally, children between the ages of six and eight depend on emotional coherence and predictable rhythms to anchor new knowledge (Immordino-Yang & Damasio, 2007). The stark environmental contrast did not simply introduce cognitive discontinuity; it created emotional ambiguity regarding what English "is," how it "should feel," and how participation ought to occur. Whenever the context changed, children often reoriented their emotional interpretation of English as if they were entering a different domain entirely, one governed by new expectations, new risks, and different social rhythms.

These field-derived differences illuminate why continuity is not an abstract preference but a fundamental condition for children to integrate English as a sustained and personally meaningful learning experience.

5.3 Adult Mediation as a Source of Continuity and Discontinuity

At this age, children rely heavily on adults to structure tone, interpret instructions, scaffold meaning, regulate participation, and guide attention (Rogoff, 2003). Yet teacher mediation and parent mediation rarely aligned in practice.

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In classroom environments, teachers relied on structured task sequences, planned terminology, controlled pacing, classroom management strategies, consistent corrective feedback, and predictable transitions that collectively defined a stable interpretive frame. At home, adults tended toward immediate improvisation, personal linguistic habits, inconsistent pacing, intuitive interpretations, minimal correction, and informal or playful interaction rhythms.

Children were therefore moving between two adult-led learning cultures whose pedagogical intentions, internal rhythms, and interpretive cues rarely matched. Research on early literacy highlights that such mismatches between school-based and home-based mediation can create uneven learning trajectories, particularly when children must repeatedly relearn how to interpret adult expectations or reorganize their internal sense of linguistic safety (Edwards & Mackenzie, 2018). The field data strongly confirmed this dynamic.

A viable design intervention cannot assume that teachers and parents will naturally align their mediation styles. Instead, continuity must be created in spite of differences in adult behavior, by offering shared cues, stable routines, and portable narrative or material anchors that allow children to interpret English consistently across domains.

5.4 Material Ecosystems: How Tools Travel (or Fail to Travel)

A further dimension of continuity emerged from the material cultures surrounding English learning. In school, children interacted primarily with textbooks, worksheets, photocopies, blackboard activities, flashcards, and publisher-provided audio tracks. At home, learning was more frequently mediated through digital apps, YouTube videos, toys, improvised drawings, and bilingual storybooks whose quality and linguistic accuracy varied.

These two ecosystems seldom intersected. Materials that children manipulated daily in classroom routines did not travel home, while the informal tools used at home were rarely recognized, validated, or pedagogically integrated into school practice. The physical anchors of learning were therefore unstable. Each environment invited different gestures, different semiotic cues, and different forms of cognitive participation.

Research on tangible learning emphasizes that consistent physical artifacts support memory formation, help establish routine, and generate emotional familiarity that strengthens conceptual understanding over time (Glenberg, 2010). When material ecosystems do not overlap, children must repeatedly reload cognitive expectations and emotional associations, weakening continuity. This insight underscores one of the strongest design rationales for creating a portable tangible kit capable of belonging equally to classroom and home without requiring translation, adaptation, or new adult training.

5.5 Emotional Continuity: A Hidden but Critical Dimension

Children's emotional stance toward English shifted noticeably depending on peer dynamics, adult tone, perceived evaluation pressure, opportunities for exploration, assigned roles, and contextual expectations. Mistake-related anxiety intensified in collective classroom settings where correctness was publicly visible or socially charged (MacIntyre & Gardner, 1994). Confidence increased in settings where narrative framing allowed errors to dissolve into the unfolding story rather than stand out as personal inadequacy.

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Field observations made clear that emotional continuity is not a peripheral concern. It directly shapes participation, expressive willingness, memory retention, and children's sense of belonging to the linguistic domain. If emotional tone fluctuates abruptly from one environment to another, children begin treating English as multiple disconnected experiences instead of a continuous developmental pathway.

A coherent design system must therefore cultivate a stabilizing emotional climate across environments, expressed through narrative structures, consistent material affordances, predictable routines, and aligned adult scaffolding. Emotional continuity makes continuity felt, not merely organized.

5.6 Continuity as a Designable Structure

From both field narratives and developmental analysis, continuity emerges as a designable system rather than an incidental alignment. Cognitive continuity allows children to return to familiar patterns, recognizable task sequences, and modular structures that lower cognitive re-entry load. Emotional continuity establishes a predictable climate that reduces anxiety and supports expressive risk-taking. Narrative continuity enables stories, characters, and roles to travel across contexts without losing coherence or emotional meaning. Material continuity ensures that the same tangible tools exist in both environments, creating familiar affordances and reinforcing learning through shared physical interaction. Mediation continuity provides adults with shared cues, scripts, and scaffolding expectations that align children's interpretive experience even when mediation styles naturally differ.

Taken together, these dimensions map directly onto the discontinuities documented earlier, specifying where the design must intervene to stabilize learning across environments.

5.7 Why Continuity Forms the Foundation for the Design Requirements

Continuity is the connective tissue through which developmental tendencies, second-language acquisition needs, emotional safety, and social participation converge. Without continuity, children must reinterpret learning expectations whenever the environment shifts, adults must independently construct pedagogical order, materials fail to anchor memory or meaning, emotional tone fluctuates unpredictably, and the learning narrative fractures into episodic and disconnected situations.

Continuity transforms English learning from a sequence of isolated encounters into a coherent developmental trajectory that children can inhabit as a stable linguistic world. For this reason, continuity constitutes the conceptual foundation upon which the synthesis and design requirements in Chapters 11 and 12 will be developed.

CHAPTER 06

TANGIBLE, EMBODIED, AND MULTI-SENSORY LEARNING

06. TANGIBLE, EMBODIED, AND MULTI-SENSORY LEARNING

6.1 Tangibility Emerging from Field Observations

Across both classroom and home environments, one of the most consistent field patterns involved children's spontaneous shift toward manipulating or enacting meaning whenever English became abstract or overly symbolic. When asked to repeat vocabulary or complete purely verbal tasks, many children redirected their focus toward drawing, gesturing, arranging objects, or inventing characters and story fragments. Rather than interpreting these behaviours as distraction or inattentiveness, the observations treated them as signs of underlying developmental needs, revealing that embodiment is not peripheral to early learning but central to how young children stabilize meaning.

These tendencies closely align with embodied cognition research, which argues that abstract ideas become more stable when grounded in physical interaction, movement, or perceptual cues (Glenberg, 2010). Children in both environments sustained focus for longer periods when activities incorporated touch, spatial placement, movement, dramatic role-play, or kinesthetic improvisation. The consistency of this pattern across settings indicates that tangibility should not be conceived as an additional stimulus layered onto learning. Instead, for children in this age range, tangibility is a developmental requirement for interpreting and remembering early language concepts.

6.2 Embodied Cognition as Interpretive Lens

Embodied cognition posits that understanding does not emerge solely from internal mental processing but from the dynamic interaction between body, mind, and environment (Barsalou, 2008). The field data repeatedly confirmed this principle. Children retained vocabulary when terms were enacted, manipulated, or spatially arranged, whereas purely verbal repetition—whether spoken or written—quickly produced disengagement and emotional withdrawal.

During observations, children instinctively used gesture to anchor prepositions and acted out verbs rather than repeating them mechanically. They positioned characters or props to represent spatial relations, created movement patterns to sustain attention, and used physical objects to externalize meaning they could not yet maintain internally. These actions directly correspond to studies showing that embodied learning strengthens semantic grounding and supports memory consolidation in young learners (Mavilidi et al., 2015). The implication for design is unambiguous: embodied formats must be treated as core mechanisms rather than optional extensions, because embodiment is the means through which cognitive load is reduced and early linguistic meaning becomes tangible.

6.3 Narrative as a Tangible–Emotional Bridge

Narrative elements surfaced repeatedly during fieldwork as children invented stories, characters, and imagined scenarios around English vocabulary. These spontaneous narratives allowed children to "enter" English without confronting the anxiety of direct performance or explicit evaluation. Developmental research suggests that stories create psychologically safe containers that allow children to explore unfamiliar meanings indirectly, experimenting with language from within a symbolic or dramatic frame rather than as a public display of competence (Nicolopoulou, 2014).

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Across contexts, narrative tangibility appeared in several highly stable ways: children consistently preferred characters rather than abstract symbols; story-worlds remained coherent across multiple sessions; narrative roles significantly reduced mistake anxiety; and children spontaneously assigned themselves identities within the unfolding story without needing adult prompting. Narrative is therefore not a decorative layer attached to learning. It forms the structural bridge between emotional safety and embodied engagement, allowing children to interact physically with meaning while protecting expressive risk under a symbolic identity.

6.4 Multisensory Learning Across Contexts

Children in both home and school environments relied on multiple sensory modalities to make sense of English. Visual cues —such as drawings, scenes, imagery, or gesture—helped clarify content, while auditory cues such as tone, rhythm, musical repetition, or spoken emphasis supported retention. Kinesthetic actions, including movement, spatial arrangement, or manipulation, grounded abstract concepts and sustained emotional involvement. Tactile interaction, whether through touching, arranging, or constructing objects, further reinforced comprehension by creating a physical substrate for meaning.

Multisensory engagement consistently proved more effective than isolated sensory channels. This aligns with research demonstrating that multimodal instruction enhances encoding, retrieval, and emotional comfort in early learners (Shams & Seitz, 2008). Throughout fieldwork, multisensory activities supported more stable attention cycles, reduced the need for adult prompting, increased emotional comfort, and frequently elicited spontaneous language production. These patterns point toward the need for a tangible kit organized around modular, multisensory micro-activities that support active manipulation rather than static worksheets or rigid screen-based exercises.

6.5 Tangible Design as a Response to Discontinuity

The discontinuities documented in Chapter 5 were also expressed materially. Because the tools used in classrooms differed radically from those used at home, children lacked stable physical anchors for consolidating meaning across environments. A unified tangible design solution can address these discontinuities by creating a stable ecosystem of manipulable components that remain the same wherever learning occurs.

Such a system provides cognitive stability by offering familiar affordances that children can rely on in any setting. It creates emotional stability because familiar objects lower anxiety, establish predictable routines, and maintain a consistent tone. Narrative stability emerges as characters and physical elements act as continuity markers that travel with the child, retaining meaning across contexts. Mediation stability is achieved because both parents and teachers can draw on the same affordances without additional training or specialized pedagogical knowledge, allowing scaffolding to align naturally. Finally, tangible materials support activity stability by structuring learning into modular micro-activities that fit children's natural attention rhythms.

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Field observations showed that when children reused the same material across sessions, conceptual meaning accumulated organically and became easier to retrieve, even when contexts changed. The absence of such continuity within traditional ESL tools further demonstrates the need for a unified tangible system whose meaning is sustained through repeated physical interaction.

6.6 Tangible Design and Repairability

Given that materials will circulate between home and school, durability and repairability become essential design qualities. Children in this age range frequently handle learning tools energetically and experimentally, and many parents expressed concern about fragile materials that are costly or difficult to replace. Repairable and durable design is therefore not only a sustainability principle but an emotional and pedagogical one.

Repairable components reduce stress for adults, who no longer feel responsible for protecting delicate materials, and increase autonomy for children, who benefit from artifacts they can reassemble, maintain, or adapt. This aligns with design-for-repair principles used in children's products, emphasizing low-cost replacement, modularity, safety, transparency of mechanisms, and clear affordances that communicate how objects can be manipulated or recombined (Denis & Pont, 2020). The kit must embody enough robustness to withstand energetic manipulation without sacrificing sensory playfulness or narrative flexibility.

6.7 Designing with Tangibility as a Primary Principle

Across all field observations, tangibility emerged not merely as a medium of presentation but as a methodological and pedagogical principle in its own right. Tangible components align naturally with developmental cognition, support emotional regulation, leverage narrative roles for psychological safety, enable multisensory engagement, promote continuity between home and school, and provide shared cues through which adults can scaffold learning consistently.

For these reasons, tangible, embodied, and narrative elements must serve as the core architecture of the educational kit rather than a set of auxiliary materials. The present chapter establishes the conceptual basis for this principle, clarifying why the design phase must prioritize manipulable components as primary carriers of meaning and continuity. The following chapter will position inclusion, accessibility, and emotional safety as the second foundational dimension of the design requirements.

CHAPTER 07

INCLUSIVE AND SOCIO-EMOTIONAL DESIGN FOR CHILDREN

07.
INCLUSIVE AND SOCIO-EMOTIONAL DESIGN FOR CHILDREN

7.1 Inclusion Emerging from Field Realities

Across both home and classroom environments, participation varied not only in relation to attention or confidence but also in response to deeper contextual differences in access, family background, levels of support, and availability of materials. Some children arrived with rich linguistic exposure from home, while others had almost no meaningful contact with English outside school. In several households, parents expressed confidence in helping with English activities, whereas others reported discomfort, uncertainty, or a sense of inadequacy when mediating linguistic tasks. Within classrooms, teachers noted that certain instructional formats systematically favored children who were more verbally expressive, less sensitive to correction, or more accustomed to symbolic school routines.

These observations revealed that inequity in early English learning is not only structural or institutional but deeply experiential. Children did not merely differ in linguistic ability; they differed in emotional readiness, access to supportive materials, family routines, tolerance for visible performance, previous familiarity with symbolic formats, and sensitivity to perceived failure. Field evidence made clear that English learning is experienced through a series of interacting conditions that either widen or narrow the child's availability for participation.

This dynamic reflects long-standing research showing that learning environments often privilege specific developmental or social profiles unless inclusive structures are intentionally embedded (Florian & Black-Hawkins, 2011). Within this thesis, inclusion therefore emerges not as a philosophical commitment but as a necessary response to the uneven terrain that children encounter as they navigate English learning across multiple environments.

7.2 Emotional Safety as a Condition for Participation

Field observations consistently showed that emotional states influenced participation more visibly and more powerfully than linguistic knowledge or grammatical competence. Children with strong vocabulary sometimes withheld speech when the situation felt evaluative or socially charged, while children with more limited vocabulary often participated freely when activities were situated within play, gesture, or narrative structures. This is consistent with research demonstrating that early participation in second-language learning depends more on emotional climate than on formal accuracy (MacIntyre & Gardner, 1994).

Emotional safety during early English learning is shaped by multiple forces, including the tone of adult mediation, the predictability of activity sequences, the degree to which mistakes are visible or socially marked, the presence of peer evaluation, the clarity of role assignments, and the extent to which activities incorporate embodied, narrative, or symbolic framing. Children aged six to eight interpret mistakes not as neutral informational feedback but as emotionally charged signals, making emotional stability a prerequisite for sustained engagement. When emotional continuity is disrupted, children frequently "exit the task" even when they fully understand the linguistic content.

These realities reinforce the need for emotional safety to be embedded directly within the design of the materials—through narrative roles, clear affordances, modular formats, and playful structures—rather than relying exclusively on adults to maintain a protective tone. Children should not have to depend on adult interpretive skill to remain psychologically safe during linguistic experimentation.

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7.3 Accessibility Through Material and Activity Design

Within the scope of this research, accessibility is not limited to disability adaptation. Instead, accessibility refers to the capacity of every child to meaningfully engage with English learning regardless of cognitive style, emotional sensitivity, home resources, mediation differences, linguistic exposure, attention rhythms, or previous learning experiences. Universal Design for Learning (UDL) principles provide a useful conceptual frame, emphasizing multiple means of representation, engagement, and expression (CAST, 2018). However, field observations suggested that UDL principles must be grounded materially, not merely conceptually, in order to become actionable for young learners and their caregivers.

Children accessed English more easily when meaning was represented physically through objects, scenes, or enacted actions; when participation did not depend exclusively on verbal skill; when activities allowed multiple entry points through gesture, movement, selection, or arrangement; and when tasks offered both social and individual pathways. In classroom environments, children who struggled with written exercises frequently engaged fluently during tangible or visual activities. At home, children who hesitated verbally often participated through enactment, character play, or drawing.

These patterns confirm that accessibility requires multimodal, tangible, embodied, and narrative structures rather than simple differentiation of instructional content. Accessibility is thus expressed not through instructional modification alone but through the physicality and multimodality of the materials themselves.

7.4 Representation, Identity, and Psychological Proximity

The narrative tendencies observed in the field indicated that representation plays a subtle yet powerful role in children's emotional engagement with English. When children encountered characters, settings, or scenarios that felt psychologically proximate—familiar, playful, and culturally resonant—they entered English learning more willingly and with lower emotional resistance. Although this thesis does not mandate a fixed use of local stories as the sole pedagogical format, the fieldwork suggests a broader principle: children benefit from tools that reflect their cultural, emotional, and narrative landscapes (Nicolopoulou, 2014).

Representation in this context should not be interpreted as decorative theme-setting. It functions as a stabilizer of emotional tone, a bridge between home and school environments, a motivator for initial participation, and a frame for embodied and narrative activities. In addition, recognizable symbols and narrative identities act as anchors for continuity, allowing meaning to persist across sessions and settings even when linguistic accuracy fluctuates.

The educational kit must therefore avoid abstract, overly foreign, or culturally distant imagery that limits emotional proximity. Instead, it should adopt symbols, characters, and narrative structures that resonate with children's lived experiences in Italy, supporting both emotional investment and narrative coherence.

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INCLUSIVE AND SOCIO-EMOTIONAL DESIGN FOR CHILDREN

7.5 Reducing the Mediation Burden on Adults

Field data revealed that both parents and teachers often felt uncertain when supporting English activities. Teachers reported a lack of time and material flexibility in classrooms, while parents expressed limited confidence, a lack of linguistic preparation, or uncertainty about how to scaffold participation without explicit instructions. Mediation ability varied widely depending on linguistic proficiency, emotional comfort, and available time.

An inclusive design strategy for this project therefore requires that activities be self-explanatory to adults, that material cues support intuitive scaffolding without specialized training, that instructions be minimal yet clear, that the kit be usable regardless of adult linguistic proficiency, and that emotional tone be embedded within the materials instead of relying solely on adults to generate a supportive environment. Inclusive design literature emphasizes the importance of lowering mediation load in child-facing services so that participation becomes equitable even when caregiver expertise varies (Sanders & Stappers, 2014).

When adults feel confident in guiding activities, children receive consistent emotional and structural cues across environments, strengthening mediation continuity and reducing experiential fragmentation.

7.6 Designing for Divergent Access Conditions

Field observations confirmed that not all families have equal time, space, or material resources for supporting English learning at home. Observed conditions included small apartments with limited desk space, absence of printed or durable materials, reliance on mobile phones for entertainment, and highly variable parental schedules. These disparities have direct implications for continuity.

To sustain learning across such heterogeneous conditions, the educational kit must be compact and portable, easy to store, and usable in small physical spaces. It must function without technological dependence, withstand energetic handling, and remain accessible without additional purchases or specialized peripherals. These requirements align with inclusive design principles emphasizing flexibility, simplicity, and universality (Mace, 1998). A low-threshold tangible system becomes essential for maintaining continuity across families with differing access conditions.

7.7 Inclusion as a Design Requirement, Not a Supplement

The intersection of developmental patterns, emotional conditions, family resources, mediation differences, and contextual constraints demonstrates that inclusion must be structurally embedded in the design of the kit. Inclusion is not a secondary feature applied after core functionality but a primary requirement emerging from uneven access conditions, divergent mediation styles, fluctuating anxiety levels, classroom constraints, sensory diversity, attention rhythms, and narrative preferences.

This chapter articulates the inclusive principles that will later translate into explicit design requirements. These principles ensure that the kit not only operates functionally but supports equitable participation across the highly varied ecosystems in which six-to-eight-year-old children encounter English. The purpose is not uniform performance but stable participation and continuity across environments.

CHAPTER 08

FIELD RESEARCH: CONTEXTS AND PROCEDURES

08. FIELD RESEARCH: CONTEXTS AND PROCEDURES

8.1 Overview of Field Research Contexts

The field research took place across two primary learning environments in which children aged six to eight encountered English: classrooms and homes. Each environment presented its own distinctive routines, materials, mediation styles, and emotional climates. Building on the earlier identification of continuity as a central developmental concern, the fieldwork focused on documenting how children interpreted and experienced English as they moved between these environments. The intent was to observe English learning as a distributed experience, influenced not only by instructional content but by shifts in tone, activity flow, space, and adult engagement.

This dual-environment approach is grounded in socio-ecological perspectives, which understand learning as emerging from multiple overlapping contexts rather than from a single instructional setting (Bronfenbrenner, 1979; Rogoff, 2003). For this reason, field data were collected with systematic attention to the flow of activities, transitions between tasks, mediation practices used by adults, behavioural patterns displayed by children, the use and availability of materials, emotional responses during engagement, peer interactions, spatial constraints, and the presence or absence of familiar routines. These observations offered a textured view of how learning unfolded naturally rather than as a controlled experimental process.

This chapter describes how these data were gathered, interpreted, and later transformed into developmental and design insights that shaped subsequent analysis.

8.2 Classroom Contexts

Classroom observations took place during regular English lessons in Italian primary schools and reflected the pacing requirements and content expectations of formal curriculum. English instruction typically occurred in short blocks of time and relied heavily on textbook sequences and choral repetition tasks. Movement was limited and activity structures were influenced by wider priorities in group management and schedule coordination. Multimedia resources were used occasionally, and transitions between activities unfolded quickly in response to overall classroom rhythm and time constraints.

The observational focus in classrooms centered on how children interpreted instructional cues, how their attention fluctuated across structured segments, and how visible evaluation pressure influenced their willingness to speak or attempt new forms. Additional attention was paid to how teachers scaffolded or constrained exploratory behaviours and how the physical layout of the classroom shaped the possibility of imaginative or embodied activities. Data were recorded as detailed field notes that captured behavioural sequences, collective rhythms, linguistic interactions, signs of emotional regulation or withdrawal, and the embodied responses that accompanied moments of effort or disengagement.

8.3 Home Contexts

Home observations were conducted in informal and naturally occurring settings, where English-related activities either took place intentionally or emerged spontaneously through play, media use, or conversation.

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FIELD RESEARCH: CONTEXTS AND PROCEDURES

These contexts varied widely, reflecting differences in parental linguistic confidence, availability of materials, space for imaginative play, daily routines, schedules, and household expectations. Homes differed not only in resources but also in tone, atmosphere, and the level of familiarity with English as part of everyday life.

The observational focus in homes included how parents introduced or responded to English prompts, how children initiated or avoided English-related activities, the role of digital media such as videos, audio tracks, and apps, and the degree to which physical materials were available or improvised. Learning often occurred through play rather than instruction, with children using toys, drawings, gestures, or invented scenarios to express meaning. Emotional tone became especially salient, with noticeable shifts in confidence, comfort, or frustration during attempts at language practice.

The diversity of home conditions made visible the variation in mediation, emotional climate, and material resources that contributed directly to the inclusion and continuity principles identified in earlier chapters.

8.4 Observation Protocol

The observation protocol followed guidelines for naturalistic educational research, emphasizing unobtrusive documentation of learning without intervention, control, or artificial task design (Merriam & Tisdell, 2016). Each session was observed as a sequence of naturally unfolding activity units with identifiable beginnings and endings, allowing behaviours to be interpreted in situ rather than through isolated academic performance.

Observations included how children interacted with materials, books, paper, manipulatives, or improvised tools; how spoken behaviour expressed confidence, hesitation, or performance anxiety; and how non-verbal forms such as gesture, posture, gaze, motion, or emotional cues signaled engagement or withdrawal. Adult mediation was documented with equal attention, including tone, scaffolding strategies, prompting styles, corrective practices, and interpretive framing. Transitions between tasks and contexts were examined for signs of disorientation, renewed focus, or emotional shift. Engagement was assessed not as a binary state but through the continuity of physical, linguistic, and emotional involvement.

This protocol ensured consistency across environments while preserving the spontaneity and natural variation inherent to children's learning.

8.5 Parent and Teacher Interactions

Interactions with parents and teachers were conducted informally and semi-structurally, allowing adults to express lived experience without the constraints of predetermined questionnaire categories (Creswell & Poth, 2018). These conversations addressed perceived challenges in supporting English learning, expectations for children's participation, emotional responses to children's struggles or successes, and observations of behaviour at home or in class. Parents and teachers commented on the strengths and weaknesses of existing materials, the practicality of narrative or tangible approaches, and their comfort or discomfort with scaffolding participation.

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These dialogues offered significant interpretive context for understanding the field observations. Adults articulated concerns about confidence, classroom constraints, material limitations, attention rhythms, and the emotional burden associated with highly performance-oriented English tasks. The data gathered from these interactions clarified how mediation continuity breaks occurred and what forms of support adults perceived as necessary for more stable participation.

8.6 Data Recording and Ethical Considerations

No audio or video recordings of identifiable children were collected. Instead, the research followed ethical guidelines that prioritized anonymity, behavioural rather than personal focus, the absence of sensitive data, voluntary participation, privacy for families, and documentation methods that did not interfere with the learning process. All observations were recorded as anonymized field notes summarizing observable behaviour and adult comments without personal identifiers or evaluative judgments.

These procedures align with ethical requirements for child-focused research and with GDPR-K principles for data minimization, ensuring that children's participation remained safe, respectful, and non-intrusive.

8.7 Analytical Procedures

Following data collection, field notes were coded and interpreted using an inductive qualitative approach. Behavioural patterns were compared across environments and mapped against developmental, emotional, pedagogical, and socio-ecological frameworks (Miles, Huberman, & Saldaña, 2014). The analysis focused on identifying recurring behavioural sequences, locating tensions between instructional tasks and developmental tendencies, mapping emotional responses to different activity types, and examining contrasts in adult mediation strategies.

Participation was compared across environments, and embodied behaviours were interpreted in relation to learning outcomes, emotional continuity, and motivation. Material gaps and opportunities were identified by examining when and how meaning was stabilized, interrupted, or fragmented across settings. These analytic outcomes later became the foundation for the Synthesis and Requirements chapters, translating empirical field patterns into design implications for a tangible, multisensory, inclusive learning system.

CHAPTER 09

FIELD FINDINGS: CHILDREN, ADULTS, AND MATERIALS IN PRACTICE

09. FIELD FINDINGS: CHILDREN, ADULTS, AND MATERIALS IN PRACTICE

9.1 Overview of Behavioural Patterns Across Contexts

Field observations carried out in both classroom and home environments revealed a set of recurring behavioural patterns that shaped how children engaged with early English learning. These patterns were consistent enough to form analytic anchors for interpretation, yet varied sufficiently to reflect the unique conditions of each environment. The findings confirm that children do not experience English as a unified or continuous activity. Instead, they navigate English as a shifting set of interactions influenced by environmental conditions, adult mediation, emotional tone, and the availability of materials. The following sections describe the key field-derived behavioural tendencies that later informed the synthesis and design requirements.

9.2 Classroom Activity Patterns

9.2.1 Structured Segments and Attention Fluctuations

English lessons within classroom settings were organized into predictable instructional segments determined by curriculum pacing and teacher expectations. These sequences helped create recognizable activity units, giving children a sense of order and procedural clarity. However, the structured nature of these lessons also exposed the limits of young children's attention cycles. Sustained engagement was most visible during short and dynamic segments, especially when movement or novelty were incorporated. Engagement frequently declined during extended worksheet tasks or repetitive symbolic drills, and improved again during embodied or movement-based activities. Participation sometimes fluctuated depending on peer visibility, with children showing more hesitation when their performance became publicly observable.

These fluctuations correspond with developmental evidence showing that children aged six to eight manage attention best when activities are brief, modular, varied, and embodied (Diamond, 2013). Classroom structure offered clarity but also highlighted how instructional pacing interacted with children's cognitive rhythms.

9.2.2 Performance Pressure and Verbal Hesitation

Teachers frequently used choral repetition, turn-taking, or individual speech requests to guide classroom participation. While these structures offered clarity of pacing, they often generated performance pressure and hesitation linked to the visibility of mistakes. Children tended to avoid speaking when the task required public correctness, when they anticipated evaluation, when peer comparison was likely, or when errors were made visible on the board. The possibility of being judged, corrected, or overheard shaped linguistic willingness even when comprehension was strong.

These reactions align with research indicating that young learners quickly internalize evaluative cues and may reduce spontaneous expression when they perceive a risk of failure or public exposure (MacIntyre & Gardner, 1994). The emotional cost of visible correctness often exceeded the cognitive demands of the task.

9.2.3 Limited Material Flexibility

Classrooms relied primarily on textbooks, photocopies, and standardized print materials.

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Although children attempted to extend symbolic tasks through gesture, personal drawings, or improvised representations, the material ecosystem did not naturally support tactile or embodied meaning-making. The lack of manipulable tools limited exploratory participation and became one of the clearest drivers of discontinuity between environments. Children consistently displayed a desire to externalize symbolic meanings, but the classroom lacked physical affordances to sustain this developmental tendency.

9.3 Home Activity Patterns

9.3.1 Informality and Variability

Home-based English activities were characterized by informality, improvisation, and wide variability. Parents frequently used ad-hoc explanations, digital videos, improvised games, toys as representational tools, multilingual mixing, and spontaneous storytelling. This informality reduced emotional pressure and increased playfulness, yet it also produced unstable routines that made skill accumulation less consistent. Children navigated English freely through play at home, but lacked predictable structure or continuity with school-based learning.

9.3.2 Mediation Differences and Emotional Tone

Parents mediated English with encouragement, but also with fluctuating confidence. Some avoided correction altogether, while others over-corrected or shifted tone abruptly. Children's emotional responses mirrored these dynamics: confidence increased when adult tone was playful and supportive, hesitation emerged with directive or corrective mediation, attention lasted longer when activities involved gesture, movement, or narrative framing, and engagement declined rapidly when tasks relied solely on verbal repetition.

These observations support socio-emotional research showing that adult tone, emotional predictability, and narrative framing strongly influence young children's willingness to participate in linguistic tasks (Immordino-Yang & Damasio, 2007). Emotional safety was not incidental—it was structurally tied to mediation style.

9.3.3 Material Improvisation

Homes varied widely in their access to English-related materials. Some had books, toys, and manipulatives for representational play, while others relied exclusively on screens or improvised objects. Material conditions shaped how English emerged, what forms of embodied expression were possible, and how easily children could externalize linguistic meaning. This variability reinforced discontinuity between environments and highlighted the importance of a portable, child-centered, screen-light material system that could stabilize opportunities for embodied learning regardless of domestic conditions.

9.4 Emotional Responses Across Tasks

Across environments, emotional responses proved to be the strongest predictor of participation.

9.4.1 Mistake Sensitivity

Children frequently retreated from tasks where mistakes were visible, audible, or publicly corrected. Even linguistically confident children minimized participation in performance-heavy settings when the risk of negative evaluation was present.

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Emotional safety, rather than vocabulary or grammatical competence, became the determining factor shaping expressive willingness.

9.4.2 Narrative and Role-Based Confidence

Confidence increased dramatically when children assumed narrative or symbolic roles, including puppets, imagined characters, or dramatic identities. Narrative framing reduced perceived personal risk by embedding errors within the story rather than marking them as individual shortcomings. These observations confirm developmental literature showing that narrative identity provides a socially safe container for linguistic experimentation (Nicolopoulou, 2014).

9.4.3 Embodied Comfort

Children expressed greater comfort and expressive fluency when tasks involved gesture, movement, manipulable objects, or spatial representation. Embodied interaction reduced cognitive load and supported retention, consistent with embodied cognition research demonstrating that physical enactment strengthens semantic grounding and memory consolidation in early learners (Glenberg, 2010; Mavilidi et al., 2015).

9.4.4 Peer Dynamics

Positive peer interactions increased engagement, while competitive, evaluative, or monitoring dynamics reduced participation. Children's perception of "being watched" was a significant factor influencing silence, withdrawal, or avoidance, even when comprehension was stable.

9.5 Material Interaction Patterns

Across both environments, children consistently attempted to transform English from an abstract symbolic activity into something concrete and manipulable. They arranged objects to represent words, created miniature scenes to externalize meaning, used spatial relationships in place of verbal explanation, drew symbolic references, and improvised tactile markers to stabilize interpretation. These behaviours revealed an intuitive preference for embodied meaning-making over symbolic manipulation at this developmental stage, and they highlighted a major structural gap: existing ESL materials rarely support this developmental tendency.

Children demonstrated that linguistic meaning becomes more accessible when anchored in manipulable or spatial forms, whereas symbolic print tasks often created disengagement.

9.6 Cross-Context Findings: Where Continuity Breaks

When classroom and home observations were integrated, five forms of discontinuity became especially clear. Cognitive discontinuity emerged because activity structures differed sharply between environments, challenging children's attention rhythms and limiting learning transfer. Emotional discontinuity was visible in the changing tone, correction style, and perceived safety that reshaped children's interpretations of English. Material discontinuity arose because tools were not shared, making it difficult for embodied or narrative meaning to travel across contexts. Mediation discontinuity became evident when teachers and parents relied on different scaffolding patterns, interpretive cues, and expectations for participation.

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Finally, narrative discontinuity appeared when English learning was experienced as disconnected episodes rather than as a coherent story or evolving identity.

These cross-context findings align with ecological and socio-cultural research emphasizing the interconnectedness of environments, mediation, and routines in children's development (Rogoff, 2003; Bronfenbrenner, 1979). They form the empirical foundation on which the Synthesis and Design Requirements chapters will later build, translating discontinuity patterns into tangible design parameters for a unified, embodied, inclusive learning system.

CHAPTER 10

MARKET BENCHMARKING THROUGH THE LENS OF CONTINUITY

10. MARKET BENCHMARKING THROUGH THE LENS OF CONTINUITY

The market for early-learning products targeting children roughly between two and eight years old is vast, highly professionalized, and constantly expanding. It spans global EdTech platforms, subscription-based learning ecosystems, toy brands, animated media environments, and school publishing catalogues. At first glance, the variety of available products might suggest that designing for young English learners could easily draw upon existing tools. Yet, when these products are examined through the continuity lens established earlier in this research—cognitive continuity, emotional continuity, material continuity, narrative continuity, and mediation continuity—a more complex picture emerges. The market appears less as a repository of ready-made solutions and more as an ecological mirror of the same fragmentation observed in children's daily learning lives. This fragmentation aligns with socio-ecological perspectives showing that child development is shaped by misaligned settings, uneven tools, and unpredictable mediation across environments (Bronfenbrenner, 1979; Rogoff, 2003).

Rather than beginning with abstract categories, this chapter follows concrete clusters from the benchmarking process and asks what kind of learning world each product constructs and how that world supports or disrupts continuity between home and school. The point is not that these tools are inadequate or poorly designed—many are rich, research-informed, and broadly valued—but that taken together, they do not yet form an ecosystem capable of giving a six- to eight-year-old child a stable, embodied, emotionally safe, and narratively coherent relationship with English.

10.1 Digital learning platforms: structured but disembodied worlds

A first cluster of cases includes large educational platforms such as Khan Academy and Khan Academy Kids, which offer free, standards-aligned practice, instructional videos, and teacher/parent dashboards covering subjects from early years to early college. Khan Academy explicitly positions itself as a nonprofit committed to providing a world-class education for anyone, anywhere, using self-paced exercises and progress tracking to support learners both inside and outside school. The children's app, Khan Academy Kids, adapts this approach with age-appropriate visuals, early literacy content, and playful activities intentionally designed for young learners. ABCmouse offers a subscription-based early learning academy with thousands of activities and a full multi-subject curriculum for ages two to eight. Its platform structures learning through a guided pathway, rewards, and a sense of visible progression, and has been widely adopted in schools and libraries. BrainPOP and BrainPOP Jr. follow a similar model, using animated explanations and quizzes to introduce curriculum concepts and provide teachers and parents with ready-made instructional sequences.

From a cognitive standpoint, these platforms are strong. They clarify objectives, break content into manageable steps, provide opportunities for repetition, and allow learners to progress at their own pace—qualities consistent with mastery-oriented learning research. But for early language learning, they rely almost entirely on symbolic operations on a screen: tapping icons, watching short videos, dragging images, responding to audio prompts, and choosing among written options. They seldom involve objects, gesture, spatial enactment, or multimodal manipulation—the kinds of embodied interaction that anchored cognition research identifies as critical for early understanding (Barsalou, 2008; Glenberg, 2010).

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The child's relationship with English within these platforms becomes a relationship with icons and avatars rather than with manipulatives, shared artefacts, or co-present peers.

Emotionally, these platforms often rely on correctness-based feedback, streaks, or reward mechanics. While motivating for some, such structures can quietly trigger or reinforce performance anxiety in young language learners, especially when evaluation is visible or cumulative (MacIntyre & Gardner, 1994). Where socio-emotional content exists, it is often segmented into explicit "SEL" activities rather than being woven directly into language practice. Most importantly, even when teachers introduce these platforms at school and parents use them at home, the child does not experience them as a continuous learning identity. They represent an additional digital space—a third environment—rather than a shared, portable world that moves across settings, materials, relationships, and routines.

From the continuity perspective developed in this thesis, digital platforms offer strong cognitive structure but weak embodiment, weak narrative transport, and limited ecological integration. They may function as consistent environments internally, but they do not travel well between contexts in a way that feels tangible, emotionally grounded, or relationally coherent.

10.2 Language-specific apps: gamified micro-lessons

A second cluster includes language-specific apps such as Duolingo ABC, developed by the company behind Duolingo to support early literacy and foundational vocabulary through short interactive lessons. Duolingo ABC uses images, letter–sound associations, micro-stories, and immediate feedback to teach phonics and early reading skills. Reviews of children's English learning apps emphasize the convenience of bite-sized tasks, offline access, and brief interactions that suit young children's attention span.

These tools refine micro-learning logic: the child receives tiny linguistic tasks, visible success markers, and a predictable sense of progression. For older learners or adults, this format can feel playful, efficient, and controlled. But for six- to eight-year-olds, the experience is still largely individual, screen-bound, and divorced from embodied or social meaning-making. There are no shared artefacts to manipulate together with peers or caregivers. There is no narrative identity that the child inhabits outside the app. There is no co-present scaffolding that supports relational continuity. The pedagogical logic optimises solitary digital engagement rather than embodied and co-constructed linguistic play.

Cognitively, these apps deepen the strength of fine-grained symbolic practice but keep the child's body, gestures, and material environment outside the learning loop. Emotionally, play mechanics can reduce boredom, but the framing still places correctness at the center, making experimentation more costly for hesitant or error-sensitive children. The result is that language apps circulate everywhere—on phones, in school recommendations, in waiting rooms—but without anchoring home and school as a unified learning world. They add one more layer rather than resolving fragmentation.

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10.3 Public-service media ecosystems: narrative richness without co-creation

The benchmarking also includes public-service media ecosystems such as PBS Kids and the extensive universe of Sesame Workshop content. PBS Kids frames its mission as using media to "open worlds of possibilities for all children" through educational series, games, and digital activities for ages roughly two to eight. Sesame Street, developed by Sesame Workshop, has decades of research supporting its mix of characters, music, sketches, humor, and socio-emotional themes. Its expansion across streaming and digital platforms reveals the adaptability and cultural staying power of its narrative environment.

These ecosystems excel at narrative and socio-emotional continuity. Children encounter familiar characters repeatedly across episodes, story formats, and platforms. The fictional world is emotionally safe, recognisable, and experientially rich, and its pedagogical effectiveness in early childhood is well established. The story world becomes a stable emotional frame that children can return to over time.

From the continuity lens of this thesis, two critical gaps emerge. First, the child's role remains primarily consumptive or responsive rather than productive or embodied. Even when companion games exist, most interactions ask the child to watch, respond, or select rather than to co-create linguistic meaning through spatial action, physical manipulation, or joint activity with an adult. Second, the story world does not inherently transform into a portable learning system that unites school and home activities. Teachers may use a clip as part of a lesson; parents may show the same character at home; but the connective tissue between settings depends entirely on adult improvisation. There is no built-in system of artefacts, no tangible materials designed to circulate, and no shared routine that transforms passive media exposure into an embodied, narrative, and continuous English practice.

In short, public-service media ecosystems provide strong narrative continuity and emotional richness at the level of fiction but limited continuity at the level of embodied learning behaviour.

10.4 Subscription ecosystems and school-linked resources

Another cluster includes subscription ecosystems such as ABCmouse, marketed as a comprehensive early-learning academy for children ages two to eight, with thousands of cross-subject activities. Many of these platforms offer school-linked versions or library access, blurring the line between home and school use through shared logins, dashboards, and curricular pathways.

In theory, these systems could support continuity: the same interface functions across contexts, and the same characters or tasks are available both at school and at home. In practice, integration remains limited. Classroom constraints on time, device availability, and pacing make it difficult for teachers to embed these tools deeply into instructional routines. At home, usage depends on subscription cost, parental motivation, availability of screen time, and children's preferences relative to entertainment-based media.

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As with other digital solutions, continuity tends to be defined in terms of account access rather than embodied learning. Without tangible materials, manipulatives, narrative scaffolding, or shared embodied projects, continuity becomes a continuity of interface rather than a continuity of experience. Offline worksheets or printable activities—when offered—shift children back to paper-and-pencil tasks rather than multisensory, embodied engagement. The ecological mismatch between digital logic and home/school continuity remains unresolved.

From a socio-technical standpoint, this cluster illustrates that continuity in access is not the same as continuity in learning. Without embodied anchors, emotional safety, material portability, and narrative framing, the child's experience remains compartmentalised.

10.5 Media-adjacent games and school-friendly platforms

Game-based platforms such as Kahoot! occupy a visible niche between formal and informal learning. Kahoot! supports live quiz-style participation in classrooms and online environments and is widely used for vocabulary review, grammar practice, and general knowledge recall. Its competitive and real-time structure can energise participation and create social momentum.

Yet, from the continuity standpoint, the contribution is narrow. The experience remains symbolic and recognition-based rather than expressive or embodied. Competition is built into the logic of participation, which may energise some children but creates anxiety or self-consciousness for others—a pattern particularly visible in early second-language learning (MacIntyre & Gardner, 1994). Kahoot! unites environments at the level of interface and event but does not offer a stable, emotionally safe, embodied, or narrative-rich learning world that travels with the child.

Recent shifts by PBS Kids toward gameplay-centered formats follow parallel media consumption patterns but remain screen-dominant. They validate familiar digital habits but do not fill the gap around co-present, manipulable, long-term learning projects.

10.6 Toys, "learning through play," and educational approaches

At the opposite pole are tangible play systems, maker-style kits, and pedagogical environments inspired by Montessori, Reggio Emilia, Waldorf, and related traditions. These systems provide rich sensory environments with open-ended materials, wooden manipulatives, construction sets, and classroom spaces designed to support autonomy, exploration, and meaning-making through embodied practice. Research promoted by organisations such as the LEGO Foundation demonstrates that playful, hands-on experiences can foster deep cognitive engagement, social development, and emotional well-being when facilitated appropriately.

From the continuity lens, these environments are exceptionally strong in embodied and emotional dimensions. Children externalise thinking, co-construct narratives, and manipulate objects as part of exploratory learning. These qualities resonate strongly with research highlighting the role of play, narrative identity, and physical action in early development (Bruner, 1996; Nicolopoulou, 2014). However, for the specific goal of early second-language learning, these environments do not function as language systems. They are pedagogically rich but language-neutral; English exposure depends entirely on adults, their confidence, and their improvisational skill.

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Without clearly embedded linguistic scaffolding—portable, non-intrusive, and child-driven—these approaches remain fertile but incomplete ecosystems for ESL continuity.

Access is also uneven. Families and schools able to adopt Montessori or Reggio materials tend to possess higher resources, reinforcing inequities rather than reducing them. This gap is central to critiques from human-centered and people-centered educational design, which argue that meaningful inclusion requires more than philosophical agreement—it requires material equity (Cameron, 2001; Pinter, 2011).

10.7 Continuity gaps across clusters

When the benchmarking is read as a single ecological system rather than as isolated cases, five continuity gaps become clear. Cognitive continuity is split between structured, screen-based symbolic tasks and unstructured embodied play; no case balances clear linguistic progression with developmentally appropriate embodied exploration (Barsalou, 2008; Glenberg, 2010; Diamond, 2013). Emotional continuity is largely absent; tools either ignore anxiety or inadvertently amplify it through correctness and competition, while emotionally rich environments rarely frame language as a psychologically safe domain (Immordino-Yang & Damasio, 2007; MacIntyre & Gardner, 1994). Material continuity is disrupted because products are tied to fixed locations, institutional furniture, or personal devices, with almost no child-owned artefacts designed to travel across contexts as stable anchors (Shams & Seitz, 2008). Mediation continuity is assumed rather than supported, despite clear evidence that adult confidence, time, and scaffolding strategies vary widely (Edwards & Mackenzie, 2018; Pinter, 2011). Finally, narrative continuity remains underused: while many products have fictional characters or structured curricula, very few integrate narrative, embodiment, and language into a portable identity that the child inhabits across environments (Bruner, 1996; Nicolopoulou, 2014).

Taken together, the market is not missing a single feature; it is missing a coherent continuity logic across product categories.

10.8 What this benchmarking contributes to the thesis

This benchmarking does not validate a predetermined solution but clarifies and sharpens the structural problem that this thesis addresses. By examining how major actors—nonprofit platforms, commercial subscriptions, public-service broadcasters, toy ecosystems, and school publishers—approach or fail to approach continuity, the research shows where design innovation is most urgently required.

The analysis demonstrates that continuity cannot be delegated to any one existing category. Adding another app, worksheet, toy set, or modular classroom resource will not resolve structural fragmentation. Any credible child-centered ESL design must work between contexts, not merely within one. It must simultaneously harmonise embodied action, emotional safety, narrative identity, and adult mediation without assuming uniform skill, time, or resources from caregivers or teachers.

The chapters that follow build directly on this analysis, translating continuity gaps into explicit design requirements that respond to developmental realities and to the actual competitive and cultural conditions in which children live and learn.

CHAPTER 11

SYNTHESIS

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11.1 From Fragmented Episodes to a Coherent Interpretation

Across all fieldwork conducted in this research, early English learning emerged not as a continuous developmental trajectory but as a fragmented sequence of episodes. Children did not move through English with a stable internal structure; instead, they passed between sharply contrasting environments that reshaped how they interpreted the language each time they encountered it. This pattern echoes socio-ecological theories of child development, which emphasize that learning outcomes depend not only on instructional content but on the interlocking contexts in which children operate (Bronfenbrenner, 1979; Rogoff, 2003).

In classrooms, English was typically framed through structured routines, explicit pacing, and visible evaluative expectations. At home, it tended to become informal, improvised, or screen-mediated, reflecting the interplay between parental confidence, available resources, and everyday routines. Because these environments provided inconsistent cues—different roles for adults, different materials, different expectations—children often had to "start over" emotionally and cognitively whenever the setting changed. This discontinuous experience is the foundation on which the synthesis presented in this chapter is built.

11.2 Five Interdependent Discontinuities Defining the Learning Landscape

The converging evidence from developmental research, ESL literature, field observations, and market benchmarking shows that discontinuity is not a single obstacle but a network of interconnected disruptions affecting children's cognitive, emotional, material, social, and narrative experience of learning.

On the cognitive level, children in this age range rely on predictable activity structures and embodied meaning-making in order to understand and retain new content (Glenberg, 2010; Diamond, 2013). Yet home and school present them with entirely different formats. One environment might prioritize worksheets and choral repetition; the other might rely on improvised play or screen exposure. As a result, children are often compelled to reconstruct understanding from scratch in each context, with very few stable patterns they can carry across settings.

Emotionally, participation proved to be highly dependent on perceived safety, clarity of roles, and reduced visibility of error (MacIntyre & Gardner, 1994; Immordino-Yang & Damasio, 2007). Classroom evaluation dynamics—such as public correction or peer comparison—and home-based improvisation created conflicting emotional climates. Children could feel closely monitored in one setting and loosely supervised in another, making it difficult for them to maintain a stable willingness to participate.

Materially, the physical tools used in each setting offered incompatible affordances. Papers, textbooks, and blackboards dominated classroom life, while toys, screens, and improvised objects structured much of home experience. Since memory and understanding in this age group are strongly supported by embodied manipulation and stable artifacts, the absence of shared materials across contexts undermined continuity (Glenberg, 2010).

In terms of mediation, teachers and parents employed different scaffolding strategies. Teachers were oriented toward curricular pacing, classroom management, and group-level expectations, while parents negotiated meaning informally, drawing on personal linguistic habits and available time.

Without shared cues and routines, children received inconsistent guidance, echoing research demonstrating that adult mediation strongly shapes early learning trajectories and can either reinforce or destabilize progress (Pinter, 2011; Edwards & Mackenzie, 2018).

Narratively, children benefit from stable story structures, recurring characters, and role-play opportunities that anchor meaning and support identity-building in language learning (Nicolopoulou, 2014). In practice, English was rarely framed as a coherent narrative across contexts. Instead, it appeared as a set of tasks, games, or isolated activities, leaving children without a unified storyline to inhabit.

Taken together, these discontinuities reveal a fragmented learning ecosystem that unsettles young learners' sense of meaning, competence, and emotional safety.

11.3 Continuity as the Structural Requirement of Early L2 Learning

When these patterns are brought together, continuity emerges as an essential structural requirement for young children's second-language learning—not as an optional pedagogical preference, but as a developmental necessity. Continuity allows children to carry emotional security, conceptual clarity, and material familiarity across boundaries that they do not control. Research consistently shows that learning stabilizes when contexts share recurring symbols, routines, and narrative anchors, enabling children to recognize themselves and their tasks across settings (Bruner, 1996; Rogoff, 2003).

The fieldwork strongly confirmed this principle. When children reused a drawing at home that had originated at school, adopted the same character in multiple environments, or recognized a familiar activity pattern, their engagement deepened and their participation became more confident. In contrast, when continuity was absent—new formats, new tones, new expectations, new tools—they hesitated, withdrew, or treated English as a different experience altogether.

Continuity therefore functions as a unifying mechanism that integrates embodied action, emotional safety, narrative framing, and adult mediation into a coherent learning journey. It is the connective structure that transforms isolated episodes into a trajectory that a child can inhabit rather than merely visit.

11.4 Children's Behaviour as a Window into Their Continuity Needs

Children's behaviour across the field settings provided a crucial interpretive window onto their continuity needs. When confronted with tasks that felt abstract, static, or strongly evaluative, children instinctively tried to externalize meaning through gesture, drawing, improvised characters, or the manipulation of nearby objects. These strategies mirror findings in embodied cognition, which show that children use physical action to structure thought, manage complexity, and reduce cognitive load (Barsalou, 2008; Glenberg, 2010).

In a similar way, children's narrative impulses—assigning roles to toys, inventing characters, creating short story fragments around vocabulary, or replaying scenarios—reflected developmental research indicating that narrative provides a psychologically safe context for exploration, particularly in second-language learning (Nicolopoulou, 2014).

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In moments where narrative and embodied engagement overlapped, children often displayed longer attention spans, more experimentation, and more confident speech attempts. These behaviours align with multisensory learning literature that emphasizes the role of multimodal input and action in consolidating early learning (Shams & Seitz, 2008).

Crucially, these behavioural patterns reveal that children attempt to create their own continuity when the environment does not provide it. A child who carries forward the same gesture from one task to another, or who revives a story fragment after several days, is building a personal bridge between contexts and episodes. The design must therefore not only respect these self-generated strategies but actively enable, reinforce, and stabilize them.

11.5 Adults' Mediation Patterns Reveal Structural Burdens

Parents and teachers did not simply differ in their approaches; they operated under distinct constraints that contributed to discontinuity. Teachers had to balance learning goals with group management, curricular timelines, and institutional expectations. Parents, by contrast, often balanced encouragement with uncertainty about their own linguistic competence, their role in English learning, or the "right" way to help. These patterns reflect research documenting the difficulties of aligning school-based and home-based literacy and language practices, particularly when expectations are not explicitly shared (Edwards & Mackenzie, 2018).

The synthesis therefore recognizes adults as participants in the learning ecology who also require support. Continuity cannot be achieved if mediation remains heavily dependent on individual adult skill, time, and confidence. Materials, cues, and activity structures must gently guide adult behaviour, reducing the interpretive burden on both teachers and parents. Instead of assuming that adults will "translate" tools into developmentally appropriate practice, the design must embed alignment into the artefacts and activities themselves.

11.6 Benchmarking Confirms Systemwide Misalignment

The benchmarking phase reinforced the insight that continuity is largely absent from existing ESL and early childhood tools. Digital resources often relied on two-dimensional repetition and symbolic interaction, limiting embodied engagement. Worksheets and traditional task formats reinforced evaluative pressure and encouraged narrow forms of participation. Play-oriented kits and pedagogical environments supported creativity and exploration but lacked explicit linguistic scaffolding or continuity between home and school. Very few tools offered cross-environment coherence, shared narratives, or aligned mediation strategies.

These observations mirror broader critiques in educational design, which point to the disconnect between product features and children's developmental realities (Livingstone et al., 2018). The market landscape suggests that the required solution is not incremental. It is not a matter of slightly improving an app, adding a worksheet, or updating a toy. What is needed is a new class of ESL learning tools built from the outset on continuity, embodiment, narrative coherence, and inclusive mediation.

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11.7 A Continuity-Centered Framework for Design

Bringing together the theoretical grounding, empirical findings, and benchmarking insights yields a framework consisting of five mutually reinforcing pillars that structure the design logic of this thesis.

First, embodied meaning-making ensures that language becomes tangible and spatially grounded, reducing cognitive burden and supporting comprehension through action, gesture, and manipulation (Barsalou, 2008; Glenberg, 2010).

Second, narrative stability provides a coherent emotional and conceptual thread through recurring characters, roles, or story-worlds, allowing children to recognize themselves and their learning across episodes and environments (Bruner, 1996; Nicolopoulou, 2014).

Third, material continuity creates portable, durable artifacts that maintain meaning across contexts and support memory through repeated, multisensory interaction (Shams & Seitz, 2008). These artefacts become the physical anchors of continuity.

Fourth, modular cognitive architecture aligns learning experiences with children's attention rhythms by offering short, repeatable activity cycles that can be used flexibly at home and at school (Diamond, 2013). Modularity enables teachers and parents to adapt activities without breaking the underlying structure.

Fifth, supported mediation reduces adult uncertainty through intuitive cues and clear affordances, aligning home and school expectations without requiring specialised pedagogical knowledge or high linguistic proficiency from adults (Pinter, 2011).

Together, these pillars form a continuity-centered framework that will structure the design requirements in the next chapter, translating the conceptual synthesis into concrete criteria for the ESL kit.

CHAPTER 12

DESIGN REQUIREMENTS

12. DESIGN REQUIREMENTS

12.1 From Synthesis to Requirements

The synthesis in the previous chapter demonstrated that children's early English learning is shaped less by the intrinsic difficulty of the language than by the fragmented ecosystem in which learning takes place. Continuity—cognitive, emotional, material, narrative, and mediational—emerged as the structural condition enabling children to form a coherent relationship with English across environments. The purpose of this chapter is to translate that framework into design requirements: principles that any educational intervention must follow to mend discontinuity and support the developmental, emotional, and contextual realities documented in the research.

These design requirements are not abstract or optional guidelines. They arise directly from converging bodies of knowledge, including developmental and second-language learning research (Cameron, 2001; Pinter, 2011; Diamond, 2013), embodied and multisensory learning literature (Barsalou, 2008; Glenberg, 2010; Shams & Seitz, 2008), narrative and emotional-development theory (Bruner, 1996; Nicolopoulou, 2014), and socio-ecological perspectives on learning environments (Bronfenbrenner, 1979; Rogoff, 2003). They also reflect sustained field observations in classrooms and homes and a benchmarking process examining more than ninety tools and services currently shaping early learning.

Each requirement reflects how children actually learn, not how curricula or digital platforms assume they will learn. The developmental forces shaping linguistic engagement demand coherence, tangibility, emotional grounding, and a shared ecosystem that bridges home and school.

12.2 Requirement 1: Embodied Meaning-Making as a Core Principle

Across field settings, children consistently grounded abstract English concepts in physical actions, gestures, and spatial arrangements. These behaviours correspond closely with embodied cognition research, which demonstrates that meaning is constructed through bodily interaction with the environment, especially among young learners (Barsalou, 2008; Glenberg, 2010). When tasks relied solely on symbolic manipulation—worksheets, isolated repetition, or screen-based exercises—children's engagement weakened, and performance anxiety emerged.

The design must therefore allow children to externalize meaning physically, transforming abstract language into tangible experience. Children should be able to manipulate objects, position elements in spatial sequences, enact verbs through gesture, use embodied scenarios to anchor vocabulary, and build small narrative environments that stabilize meaning. These embodied elements are not decorative; they form the cognitive backbone of the learning system by reducing cognitive load and reinforcing semantic grounding. For this age group, embodiment is not an "alternative mode"—it is the primary developmental mode through which English becomes intelligible.

12.3 Requirement 2: Narrative Stability and Emotional Safety

Field observations repeatedly showed that narrative framing lowered mistake anxiety and increased linguistic willingness.

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This pattern aligns with developmental psychology research, which indicates that story-worlds provide a psychologically safe distance for children to explore new concepts without feeling personally evaluated (Bruner, 1996; Nicolopoulou, 2014). When children adopted roles, interacted with recurring characters, or constructed imaginary contexts, English became something they could inhabit rather than perform.

The design must therefore embed a stable narrative structure that carries across home and school. This narrative should include recurring characters or roles, a consistent emotional tone, and built-in ways of framing mistakes as part of the story rather than as individual shortcomings. The narrative should give children identity anchors—figures, props, or worlds—that travel with them across settings and routines. The narrative component should support emotional continuity rather than dominate the learning path, providing safety without overshadowing linguistic clarity.

12.4 Requirement 3: Material Continuity Across Home and School

One of the strongest findings of this research was the absence of shared material anchors across classroom and home environments. Classroom materials seldom travelled home, and home materials seldom entered the classroom. Because learning for young children is deeply supported by embodied memory and repeated interaction with tangible objects, this absence constantly forced children to restart their interpretive work each time the environment changed.

To sustain continuity, the design must provide portable, robust, and consistent materials that behave identically in both environments. These materials must withstand repeated use, require minimal setup, communicate familiar affordances instantly, and remain meaningful regardless of adult linguistic skill. They must not depend on extensive preparation or additional infrastructure. The system should become the physical backbone of continuity, giving children a stable set of objects that support memory, emotional familiarity, and meaning-making wherever learning takes place.

12.5 Requirement 4: Modular Cognitive Architecture

Developmental literature and field observations confirm that children's attention rhythms favour short, varied, and repeatable activities rather than extended or linear exercises (Diamond, 2013). Classroom time constraints and the unpredictability of home routines reinforce this need. If learning depends on long stretches of uninterrupted focus, continuity collapses each time a distraction or transition occurs.

The design must therefore be organized around modular activity units that are brief and repeatable, function independently or in flexible combinations, can be paused and resumed easily, and maintain coherence even when used irregularly. Each activity should give access to small, satisfying moments of success rather than relying on cumulative progress alone. Modularity protects continuity by allowing children to re-enter English learning without feeling that they have "fallen behind." In a fragmented ecosystem, modularity is the interface through which continuity survives disruption.

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12.6 Requirement 5: Supported Adult Mediation

Parents and teachers consistently articulated uncertainty when guiding English activities. Teachers struggled with time pressure, group management, and curriculum constraints; parents struggled with linguistic confidence, pedagogical assurance, or emotional clarity about their role. Research on early literacy and L2 learning shows that adult mediation strongly shapes outcomes, and mismatched mediation can result in uneven learning trajectories (Edwards & Mackenzie, 2018; Pinter, 2011).

The design must include intuitive mediation supports that help adults scaffold learning without requiring specialized knowledge. Adult cues should be simple, consistent, and embedded directly into materials rather than delivered through long instructions. Visual or tactile prompts should guide the next step without demanding extensive verbal explanation. Activities should "explain themselves" through their affordances, enabling adults to feel competent even when they are not linguistically confident. Supported mediation is not a separate feature; it is an essential guarantor of emotional security and continuity.

12.7 Requirement 6: Inclusive Access for Diverse Homes and Schools

Field research documented wide variation in children's home environments. Some families had abundant materials and time, while others relied on small living spaces, irregular schedules, limited storage, and mobile phones as sole entertainment devices. To avoid reinforcing inequities, the design must operate effectively in diverse conditions. It must require minimal space, adapt to irregular routines, withstand energetic handling, and avoid dependence on networked technology or formal furniture. It must remain usable in multilingual or multicultural homes and in classrooms with twenty to twenty-five children.

Universal Design for Learning emphasizes multiple means of engagement and expression (CAST, 2018). Here, inclusivity must be embedded at the level of materials and activity design from the outset, not added later through adaptation. The design must treat variability as an expected condition, not as a deviation requiring compensatory strategies.

12.8 Requirement 7: Low-Tech, Privacy-Safe, Child-First Design

Digital solutions can support learning, but benchmarking showed that most digital ESL tools rely on passive symbolic consumption, closed feedback loops, or evaluative mechanics. They can also raise privacy concerns when used across home and school environments (Livingstone et al., 2018). For children aged six to eight, the primary design must remain tangible, low-tech, and privacy-safe, with digital elements used sparingly, meaningfully, and only when they enhance embodied or narrative continuity.

A low-tech design ensures accessibility for all families, supports emotional grounding through physical interaction, aligns with embodied cognition, and reduces the regulatory burden associated with child data and cross-environment digital use. Tangible interaction protects developmental alignment and gives the child more autonomy than screen-bound symbolic practice.

12. DESIGN REQUIREMENTS

12.9 Requirement 8: Repairability and Sustainability

Because materials are expected to circulate between home and school, durability and repairability are essential. Research in children's product design highlights the emotional benefits of objects that children can maintain, reassemble, or repair themselves, reinforcing agency, responsibility, and attachment (Denis & Pont, 2020). Repairable materials reduce anxiety for adults and protect the system from fragility or obsolescence.

The design must therefore use components that are easy to replace, simple to repair, and sustainable. It should avoid fragile, rare, or expensive elements and encourage stewardship, shared ownership, and a longer lifecycle. Repairability is not merely a technical concern—it reinforces emotional continuity and strengthens the child's relationship with the materials.

12.10 Requirement 9: Coherence as an Ecosystem, Not a Set of Tools

Perhaps the most crucial requirement is that the design must behave as a learning ecosystem rather than a collection of disconnected tools. Continuity cannot emerge if materials, narratives, mediation cues, and activity structures function independently. The system must weave these components together so that each element reinforces the others across environments and routines.

Drawing from socio-ecological learning theory, coherence must be designed at the system level (Bronfenbrenner, 1979), ensuring that continuity is not a side effect but a built-in property. The system becomes not just a kit or activity set, but a stable learning world that children can inhabit. This ecosystemic coherence is what transforms episodic interaction into a sustained learning pathway that remains meaningful regardless of context.

CHAPTER 13

VALIDATION AND RESEARCH CONCLUSIONS

13. VALIDATION AND RESEARCH CONCLUSIONS

The research presented in this thesis has demonstrated that early English learning for Italian children aged six to eight does not unfold as a single, coherent developmental arc. Although English is taught with good intentions in both schools and homes, it rarely appears to children as a continuous language that travels with them through the rhythms of daily life. Instead, children meet English in a series of episodes—each shaped by its own emotional climate, material setup, mediation style, task format, and social expectations. Field observations confirmed that learning does not break down because children lack capacity, but because the environments surrounding them lack alignment. Consistent with socio-ecological theories of learning, these discontinuities do not occur in isolation but form a pattern of fragmentation that destabilizes meaning as the child moves from one context to another (Bronfenbrenner, 1979; Rogoff, 2003).

This fragmentation has nothing to do with the intrinsic difficulty of English as a second language. Developmental psychology and early L2 learning research repeatedly show that children at this age learn effectively when language becomes embodied, playful, emotionally safe, and socially meaningful (Glenberg, 2010; Diamond, 2013; Cameron, 2001; Pinter, 2011). What undermines learning is not linguistic content, but the absence of continuity across environments. The structured, time-bound routines of the classroom contrast with the informal, improvisational, or screen-mediated atmosphere at home. Materials change completely between settings; adults provide inconsistent forms of guidance; emotional exposure fluctuates; and the rhythm of activity does not carry forward. As a result, English appears to the child not as one stable world, but as several unrelated ones that must be navigated independently.

For this reason, validation in this thesis cannot be understood as a simple test of whether the designed solution "works" in the sense of producing correct linguistic outputs. A continuity-centered intervention must instead be evaluated holistically, asking whether it can hold together the environments, emotional states, activity structures, mediation roles, and material interactions that shape children's actual learning lives. A valid test must observe English learning as it truly happens: in transitions, on the floor, at the kitchen table, at the classroom carpet, in brief exchanges, in improvised gestures, and in the emotional shifts that accompany all of these moments. Validation must examine whether children recognize the designed system across contexts, whether they re-enter activities without hesitation after a transition, and whether the emotional tone remains stable when they move from school to home and back again.

Meaningful validation therefore needs to span both environments. In classrooms, it should examine how children engage with the materials within the constraints of group attention, teacher pacing, spatial layout, and time pressure. At home, the same system should be tested against the realities of parental availability, material constraints, and more intimate emotional dynamics. The most compelling evidence of success would not be linguistic performance alone, but signs of continuity: a child who carries a familiar character into a home play scenario; a gesture that resurfaces in a different room; a story frame that helps a child regulate anxiety; a parent who intuitively supports the activity without needing formal instruction. These are the ecological markers that indicate that the design is functioning not as a set of isolated tools but as a bridge spanning the child's lived environments.

13. VALIDATION AND RESEARCH CONCLUSIONS

Even when time does not allow for a long validation cycle, a shorter pilot can still yield meaningful insight. A small series of classroom interactions followed by a brief take-home period can show whether the materials retain their meaning, whether children's confidence grows as the narrative stabilizes, and whether adults feel supported rather than burdened by the activities. Such a reduced validation approach remains academically defensible because it responds directly to the central claim of this thesis: continuity—not complexity—is what makes early English learning stable, memorable, and emotionally sustainable for young children.

Throughout any validation process, ethical considerations remain essential. No identifiable data should be collected; participation must remain voluntary, respectful, and unobtrusive; and observation must focus on behaviour rather than personal information. These principles align with child-focused design research ethics and ensure that the validation process reflects the same care for emotional safety that the design itself intends to support (Nielsen et al., 2020). The ethics of participation, privacy, and emotional well-being are part of the design logic, not an external regulatory layer.

The conclusions of this research return to the insight that motivated the entire inquiry: young children learn English effectively when the environments around them align with their natural strategies for meaning-making. When learning becomes embodied, when mistakes carry no emotional threat, when narrative offers a psychologically safe frame, when materials remain stable across contexts, and when adults provide consistent cues, children display the attention, creativity, and linguistic willingness that developmental research has long associated with early learning success (Bruner, 1996; Nicolopoulou, 2014; Immordino-Yang & Damasio, 2007). What most disrupts learning is not the challenge of English itself, but the instability of the learning ecosystem through which English is experienced.

This thesis therefore concludes that the central challenge in early English learning is ecological rather than linguistic. The environments that children move through each day are not aligned with one another, and this misalignment interrupts the developmental processes that make language meaningful. A continuity-centered design—embodied, narrative, tangible, portable, modular, and inclusive—responds directly to this ecological challenge. It provides a cohesive structure that neither schools nor homes can sustain alone, and creates a stable learning world in which children can grow, remember, and express themselves with confidence.

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Master of Science in PRODUCT AND SERVICE DESIGN

SAPIENZA
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Ashkan Vishkaei - Research Booklet

a.a. 2024-2025

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Continuity-Centered Educational Tool for Children

Designing educational kits for early-primary-school children to teach them a second language while balancing learning continuity between home and school

Master of Science in
Product and Service Design
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Dipartimento Pianificazione, Design, Tecnologie dell'architettura
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Title:

Designing educational kits for early-primary-school children to teach them a second language while balancing learning continuity between home and school.

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Abstract

This thesis examines how English as a second language can be more effectively learned by 6–8-year-old Italian children through embodied interaction, narrative engagement, emotional safety, and continuity between home and school. Existing ESL approaches—including static visuals, decontextualised vocabulary drills, worksheets, and digital applications centred on solitary screen use—rarely reflect how young children construct meaning. They tend to overlook children's natural strategies: gesture, physical manipulation, storytelling, spontaneous play, and shared activity with adults. They also fail to address a structural challenge identified in both literature and field observations: early English learning remains fragmented across environments, creating inconsistent emotional climates, material conditions, and behavioural expectations.

Grounded in embodied cognition (Barsalou, 2008; Glenberg & Gallese, 2012), second-language acquisition (Lightbown & Spada, 2013), narrative development (Bruner, 1996; Nicolopoulou, 2014), and ecological learning theory (Bronfenbrenner, 1979; Rogoff, 2003), this research adopts a qualitative, Human-Centered Design methodology. Observation of Italian primary school classrooms, informal exchanges with teachers and parents, and benchmarking of early-learning resources revealed four recurrent obstacles: learning suffers when language is not physically grounded; anxiety reduces oral expression; narrative potential remains underused; and discontinuity between school and home weakens reinforcement, confidence, and participation.

In response, the research proposes a continuity-centered educational kit that embeds English within culturally meaningful stories, embodied play, and portable artefacts that travel across contexts. The final system comprises modular narrative tiles with detachable gesture silhouettes, printable props, bilingual activity guidance for adults, and a flexible didactic plan organised into episodic narrative units. The kit enables children to manipulate story fragments, enact verbs through gesture, perform scenes safely through characters, and revisit the same episodes in different environments, sustaining both emotional and cognitive coherence.

The thesis contributes in two main ways. First, it operationalises embodied, narrative, and ecological learning theories into a tangible ESL system that supports attention, confidence, expression, inclusion, and accessibility in early childhood. Second, it reframes continuity not as curricular alignment but as a material, relational, and narrative condition—addressable through shared artefacts and portable routines. The resulting low-tech, culturally grounded kit offers a scalable and emotionally safe solution for sustained early English learning.

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CHAPTER 01

INTRODUCTION TO THE DESIGN PROPOSAL

01. INTRODUCTION TO THE DESIGN PROPOSAL

Learning a second language in early childhood is a profoundly embodied, emotional, and ecological process. It is not simply a matter of memorising vocabulary or repeating phrases; it unfolds through gesture, physical exploration, narrative imagination, and shared interactions with adults and peers. For children aged 6–8 —an age defined by curiosity, emerging autonomy, and strong reliance on sensory experience—language becomes meaningful only when it is enacted, told, manipulated, and emotionally supported. The foundation of this thesis rests on that idea: that early language learning depends just as much on how, where, and with whom it takes place as on what is formally taught.

In Italy, English is introduced early in primary school, yet the learning experience that children encounter is frequently fragmented. Classroom lessons tend to be structured, time-bound, and curriculum-driven, while English at home is intermittent, improvised, or absent altogether—often because parents feel linguistically insecure or lack a clear model of what to do. Digital resources promise personalised learning and rapid engagement, but they commonly replace tactile exploration with solitary screen time and introduce new inequities related to device access and parental mediation. Although the market is saturated with ESL materials, textbook catalogues, early-learning kits, and child-friendly apps, few of these tools succeed in sustaining attention, confidence, or continuity across environments.

This fragmented landscape reveals a structural challenge: early English learning lacks continuity between home and school, and existing materials do not adequately support the embodied, emotional, and narrative strategies through which young children make sense of language. Research in embodied cognition shows that children understand and remember new words more effectively when supported by gesture and sensorimotor engagement (Barsalou, 2008; Glenberg & Gallese, 2012). Socio-emotional studies highlight that emotional safety and affective reinforcement are critical for oral participation and risk-taking in a second language (Immordino-Yang & Damasio, 2007; MacIntyre & Gardner, 1994). Developmental psychology reveals that narrative is central to children's memory, symbolic thinking, and identity-making (Bruner, 1996; Nicolopoulou, 2014). Ecological learning theories emphasise that understanding emerges from systems of places, routines, and artefacts rather than from isolated instruction (Bronfenbrenner, 1979; Rogoff, 2003). Yet most commercial ESL tools and digital applications treat these dimensions separately, if at all.

The Research Booklet showed that children lose motivation when materials are static, overly symbolic, or disconnected from meaningful contexts; that teachers struggle to maintain engagement without opportunities for bodily action and story-based play; that parents feel unprepared or anxious when supporting English at home; and that no existing product sufficiently bridges these environments. It also illuminated an important opportunity: children thrive when English becomes embedded in storytelling, embodied play, and recurring rituals that connect the classroom to their personal world.

In response, this thesis adopts a continuity-centered design approach that combines Human-Centered Design (Norman, 2013), People-Centered educational principles (OECD, 2020), and qualitative design research methods (Sanders & Stappers, 2008). The intention is not to create another flashcard set, worksheet series, or digital platform, but to rethink how artefacts, narratives, mediation cues, and embodied practices can sustain one coherent learning ecology across time and place.

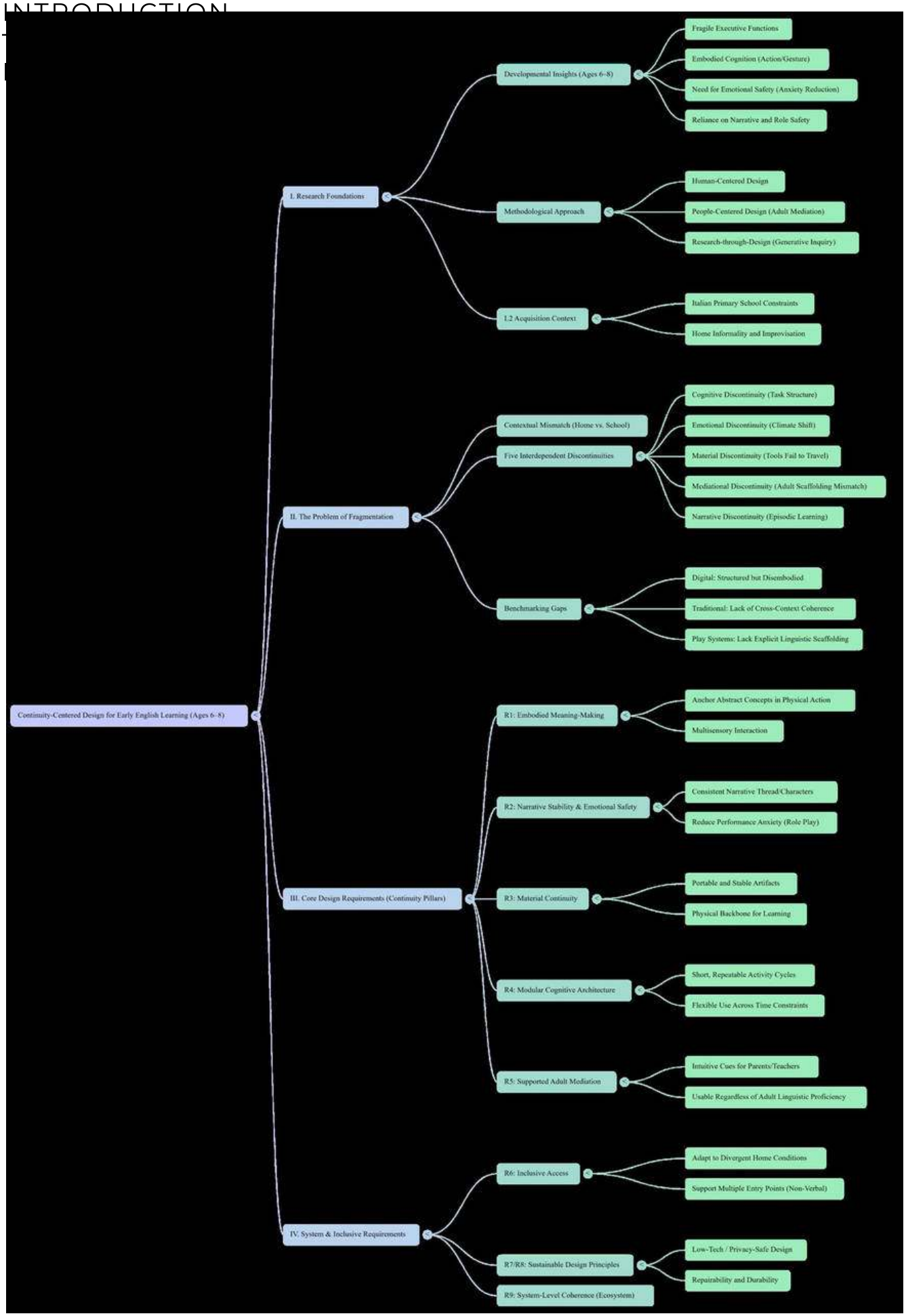
01. INTRODUCTION TO THE DESIGN PROPOSAL

The design outcome is a narrative-based educational kit for 6–8-year-old Italian children learning English as a second language. The kit integrates modular story tiles with detachable gesture silhouettes, printable and craft-based props, bilingual adult guidance, and a flexible didactic plan organised into episodic narrative units. By merging embodied interaction, emotional safety, narrative coherence, and ecological continuity, the kit enables children to learn English not as a classroom performance but as a lived, shared, and performative experience. Children can manipulate story fragments, enact verbs through gesture, perform scenes through characters, and revisit the same narrative episodes in school and at home, creating familiarity and emotional security.

This Design Booklet presents the development of that system—from the synthesis of research findings, to the emergence of the design proposition, to prototyping, refinement, and planned validation. It demonstrates how the design directly engages with the theoretical foundations established in the Research Booklet while offering a concrete, usable, and scalable solution that supports attention, confidence, expression, inclusion, and access for young English learners.

In doing so, the thesis contributes to current conversations in design for learning, early childhood education, and second-language pedagogy by showing that continuity is not merely a logistical or curricular question. It is a material, relational, narrative, and emotional condition, made possible only when learning artefacts, shared rituals, and embodied practices are intentionally designed to inhabit all the spaces in which a child's life unfolds.

01.
INTRODUCTION



CHAPTER 02

TRANSLATING INSIGHTS INTO DESIGN REQUIREMENTS

02. TRANSLATING INSIGHTS INTO DESIGN REQUIREMENTS

The research approach adopted in this thesis responds to the complexity of designing for early childhood learning, second-language acquisition, and the ecological interactions between home and school. Because the project sits at the intersection of design, education, developmental psychology, and linguistics, the methodological strategy needed to be integrative rather than linear, iterative rather than prescriptive, and interpretative rather than purely descriptive.

This chapter outlines the methodological architecture that supported the entire project. It describes how data were gathered, analysed, and translated into insights, so that the final design proposal is not the outcome of personal preference or stylistic intuition, but of a robust, multi-layered inquiry aligned with Human-Centered Design (Norman, 2013), People-Centered pedagogical approaches (OECD, 2020), and qualitative research traditions in design (Sanders & Stappers, 2008).

2.1 Overall Research Orientation

The research followed a qualitative, exploratory orientation guided by principles of Human-Centered Design and interpretative inquiry. The goal was not to "validate" a preconceived idea but to uncover existing practices, challenges, expectations, and tacit knowledge within the learning ecologies of 6–8-year-old Italian children learning English.

Three core decisions shaped this orientation from the outset.

First, learning was treated as an ecological phenomenon. Language learning does not occur in isolation but across interconnected microsystems—home, classroom, after-school environments, peer groups—each with its own rhythms, norms, and constraints (Bronfenbrenner, 1979). Adopting an ecological lens made it possible to examine continuity and discontinuity as systemic issues rather than individual shortcomings.

Second, children were treated as embodied agents. Research in developmental psychology and embodied cognition shows that children's thinking and language development are inseparable from physical manipulation, gesture, and social interaction (Barsalou, 2008; Glenberg et al., 2004). This required field methods that were sensitive not only to verbal output but to bodily engagement, affective expression, and relational patterns.

Third, adults were treated as mediators rather than simple "users." Young children depend on teachers, parents, and caregivers for linguistic input, emotional support, and activity scaffolding. Their perspectives were therefore studied not as separate from children's, but as part of a relational learning system in which mediation practices significantly shape opportunities for participation (Rogoff, 2003).

These orientations guided the choice of methods and the lens through which all data were interpreted.

2.2 Research Phases

The research unfolded in three overlapping phases, consistent with best practices in design research (Sanders & Stappers, 2012; Hanington & Martin, 2012). Each phase informed the next, while iterative reflection allowed earlier assumptions to be revisited and refined.

02. TRANSLATING INSIGHTS INTO DESIGN REQUIREMENTS

The first phase, contextual exploration and literature foundation, combined an extensive review of literature on embodied cognition, bilingual learning, narrative development, socio-emotional learning, and environmental continuity with preliminary classroom observations and informal conversations with teachers and parents. This dual foundation—scientific evidence and field realities—made visible early tensions: children's enthusiasm for movement contrasted with static materials; parents lacked clear guidance for home practice; and teachers found it difficult to create continuity across weeks and contexts.

The second phase, field inquiry across home and school ecologies, involved observation sessions, teacher dialogues, parent exchanges, and contextual mapping. Rather than relying on rigid ethnographic protocols, the inquiry followed a semi-structured, flexible format that made space for unexpected behaviours, emotional cues, and context-specific constraints to emerge. Attention was given to how children interacted with materials, how they responded to stories, how teachers scaffolded activities, how parents supported English at home, and how learning behaviours shifted across environments. From this, recurring patterns appeared: children relied heavily on gesture to express meaning, parents requested bilingual support, teachers emphasised time limitations, and no stable continuity mechanism connected school and home.

The third phase, synthesis and translation into design opportunities, brought together the collected data through thematic clustering, mapping techniques, and conceptual modelling. Rather than compressing findings into a narrow set of categories, the synthesis treated diversity as generative. Four recurring thematic clusters—embodiment, affect, narrative identity, and ecological continuity—emerged as a central interpretative framework (Chapter III). These clusters then served as a bridge from insight to design criteria, guiding the direction of early prototypes and the shaping of the design proposition.

2.3 Methods and Tools Used

Several complementary methods and tools were employed to capture the complexity of the learning ecologies under study.

Observational inquiry took place in early-primary ESL classrooms, focusing on children's behaviours, engagement patterns, gestures, use of materials, and emotional responses. The approach drew on Denzin and Lincoln's interpretative paradigm (2011), emphasising immersion, empathy, and sensitivity to nonverbal cues rather than detached measurement.

Semi-structured dialogues with primary teachers provided insight into pedagogical constraints, goals, and strategies. These conversations surfaced the perception that continuity between home and school was weak, that materials were often difficult to adapt, and that teachers needed actionable resources that would not add to their workload.

Informal conversations with parents illuminated anxieties related to supporting English learning at home, especially among those with low English proficiency. Parents expressed a desire for bilingual mediation, simple and repeatable activities, and materials that children could understand and explain independently, without relying on lengthy instructions.

A structured benchmark analysis examined existing ESL kits, craft-based toy sets, puppet resources, digital applications, and storytelling tools.

02. TRANSLATING INSIGHTS INTO DESIGN REQUIREMENTS

Using criteria derived from both literature and field insight, the review revealed consistent gaps: limited support for embodied learning, weak or fragmented narrative coherence, overreliance on screens, and an absence of tools intentionally designed to maintain continuity across environments.

Finally, thematic synthesis and mapping were used to organise insights. Clustering, journey mapping, ecological mapping, and system diagrams helped translate raw observations, interview fragments, and benchmark findings into conceptual directions, highlighting systemic gaps and opportunity areas that could be addressed through design.

2.4 Analytical Strategy

The analytical strategy combined inductive and abductive reasoning.

Inductive analysis allowed patterns and themes to emerge directly from field data, without imposing rigid categories in advance, in line with qualitative research traditions (Charmaz, 2006). Through repeated reading and comparison, behaviours, tensions, and recurring situations were clustered into preliminary themes.

Abductive reasoning then connected these emerging themes to theoretical models in embodied cognition, narrative development, socio-emotional learning, and second-language acquisition (Bruner, 1996; Shams & Seitz, 2008; Lightbown & Spada, 2013). This iterative movement between data and theory ensured that interpretations were grounded in observed reality while also being situated within robust conceptual frameworks.

The analysis did not seek quantification or statistical generalisation. Instead, it prioritised richness of meaning, ecological connection, and design relevance—criteria that define rigor within design-led, qualitative inquiry.

2.5 Ethical and Pedagogical Considerations

Working with children requires heightened ethical and pedagogical care. All observations were non-intrusive, activity-based, and fully integrated into normal classroom practice. Children were not individually evaluated, interviewed, or recorded, and their gestures, expressions, and interactions were treated with anonymity and respect.

The research followed ethical guidelines for work involving minors (UNICEF, 2015), principles of respectful design for children (Read & Bekker, 2011), and pedagogical ethics that foreground emotional safety and learner agency (OECD, 2019). These considerations did not remain abstract; they directly influenced design decisions such as favouring soft, non-intimidating materiality, allowing indirect expression through characters rather than exposing children personally, and avoiding screens and performance-heavy formats.

2.6 Methodological Rigor and Limitations

The research acknowledges limitations inherent in qualitative, field-based inquiry. Classroom access was episodic rather than continuous; home environments were mainly understood through adult accounts rather than sustained in-home observation; and the cultural specificity of the context (Italian schools and families) may limit generalisability to other settings.

02. TRANSLATING INSIGHTS INTO DESIGN REQUIREMENTS

In design research, however, rigor derives less from sample size than from the quality of triangulation and transparency. In this project, rigor was pursued through data–theory triangulation, consistency of insights across sources, clarity about interpretative choices, and traceability from research insights to subsequent design decisions (Koskinen et al., 2011). Patterns that informed the design were corroborated across literature, benchmark analysis, teacher and parent perspectives, and observed behaviour.

2.7 Methodology as a Foundation for Design

Ultimately, the methodological strategy served a single purpose: to build a traceable, evidence-based foundation for the design of the educational kit. Every element—from tile size and materiality to narrative anchoring, episodic structure, and bilingual mediation—can be mapped back to the methods and analytical processes described in this chapter.

P/D	RE.	D.S.
Home-School Fragmentation	Shared Anchors	Narrative-Based Kit
Anxiety in Language Production	Indirect Expression	Embodied Role-Play Tools
Limited Personal Meaning-Making	Open-Ended Narration	Modular Narrative Components
Lack of Embodiment	Tangible Interaction	Physically Interaction
Adult Guidance	Continuity-Centered Plan	Classroom-Home Scripts
Access Inequality	Offline-First Design	Low-Cost Repairable Kit
Emotional Disconnect	Emotions Integration	Reflective Story Episodes
Disconnected Learning Episodes	Visible Progression	Episode-Based Map

CHAPTER 03

OPPORTUNITY MAPPING AND MARKET SYNTHESIS

03. OPPORTUNITY MAPPING AND MARKET SYNTHESIS

The interpretative framework serves as the conceptual lens through which the research findings were organised and translated into design implications. Rather than introducing new data, it brings coherence to a large body of observations, interviews, literature, and benchmarking, transforming descriptive insights into meaning that can be directly applied in the Design Booklet. Its function is crucial: it ensures that the final kit is not a stylistic invention or an isolated creative gesture, but a theoretically grounded response to lived educational realities, developmental needs, and ecological constraints.

The framework rests on four interdependent theoretical domains —Embodied Cognition; Affective and Emotional Learning; Narrative Identity and Meaning-Making; and Ecological Continuity of Learning Environments. Together, they illuminate how young children learn, how they respond emotionally to early language acquisition, how story shapes cognition and confidence, and how fragmented environments interrupt learning continuity. These domains guided both the interpretation of the research findings and the identification of opportunity spaces for design.

3.1 Embodied Cognition as a Design Lens

Embodied Cognition challenges traditional assumptions that language learning is purely symbolic or mentally processed. It demonstrates that conceptual understanding emerges through bodily action, gesture, sensory engagement, and physical manipulation (Barsalou, 2008). Research in second-language acquisition has shown that gestures are not merely supportive; they directly enhance semantic encoding and recall, particularly when learners physically enact or point to meaning (Glenberg & Gallese, 2012; Kelly et al., 2009).

This lens is particularly relevant for children aged 6–8, for whom cognition is inseparable from movement, sensory play, and material engagement (Bodrova & Leong, 2007). Children this age frequently externalise thought through hands-on activity, and learning tools that do not invite manipulation risk superficial engagement or rapid withdrawal. Embodied interaction also aligns naturally with storytelling, role play, and multimodal expression: gesture can scaffold verbal production, lower performance pressure, and help children express meaning even when vocabulary is emerging (Goldin-Meadow, 2014). These developmental and linguistic realities were visible throughout the fieldwork: when confronted with abstract language tasks, children instinctively reached for props, gestures, or drawings.

As a design lens, Embodied Cognition highlighted that viable solutions must go beyond symbolic worksheets or passive media. Language must be enacted. Children need objects they can arrange, shapes they can animate, actions they can rehearse, and story scenes they can build or perform. This perspective directly informed the later focus on detachable gesture silhouettes, modular story tiles, tactile props, episodic enactment, and embodied storytelling as core mechanisms for learning.

3.2 Affective Experience and Emotional Safety

Language learning is deeply emotional. Affective responses shape motivation, confidence, willingness to communicate, and the sustainability of learning over time (MacIntyre & Gardner, 1994). Emotional safety is therefore not an accessory or afterthought, but a foundational condition for early language acquisition.

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Several strands of affective research shaped this interpretative layer. Language Anxiety Theory shows that fear of making mistakes can inhibit participation and suppress spontaneous speech, even when vocabulary knowledge is adequate (Krashen, 1982). Social-Emotional Learning emphasises that calm, predictable relationships support attention, exploration, and resilience (Immordino-Yang & Damasio, 2007). Symbolic indirection highlights that young children express complex thoughts more freely when mediated through characters, puppets, or imagined identities (Nicolopoulou, 2002). When children can "speak through" a character, the emotional stakes of correctness decrease dramatically.

Field observations confirmed these dynamics. Children hesitated when speaking as themselves, especially under evaluative visibility, but participated freely during narrative enactment, embodied games, or role-based tasks. Emotional tone was as influential as linguistic content: when activities felt safe, playful, and socially supported, confidence flourished.

This interpretative lens required design choices that stabilise emotional safety structurally rather than leaving it to adult improvisation. Children must be able to express meaning indirectly; materials must soften the emotional intensity of performance; activities should frame mistakes as experimentation; and visual tone must be respectful, calm, and aesthetically grounded without infantilising children. These principles later informed decisions about soft materiality, approachable character design, gentle tactile affordances, and the centrality of role-based narrative play.

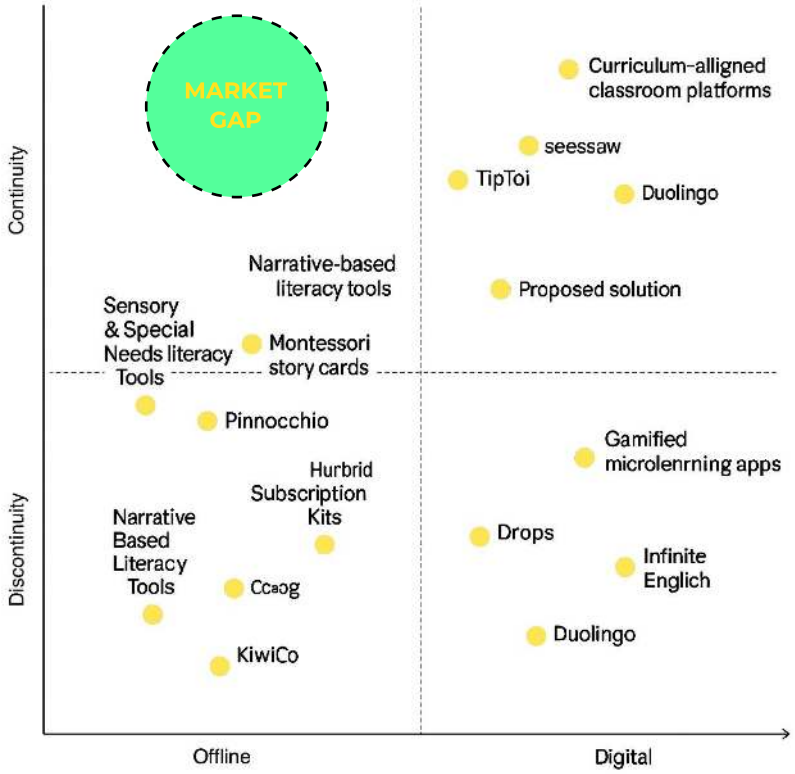
3.3 Narrative Identity and Meaning-Making

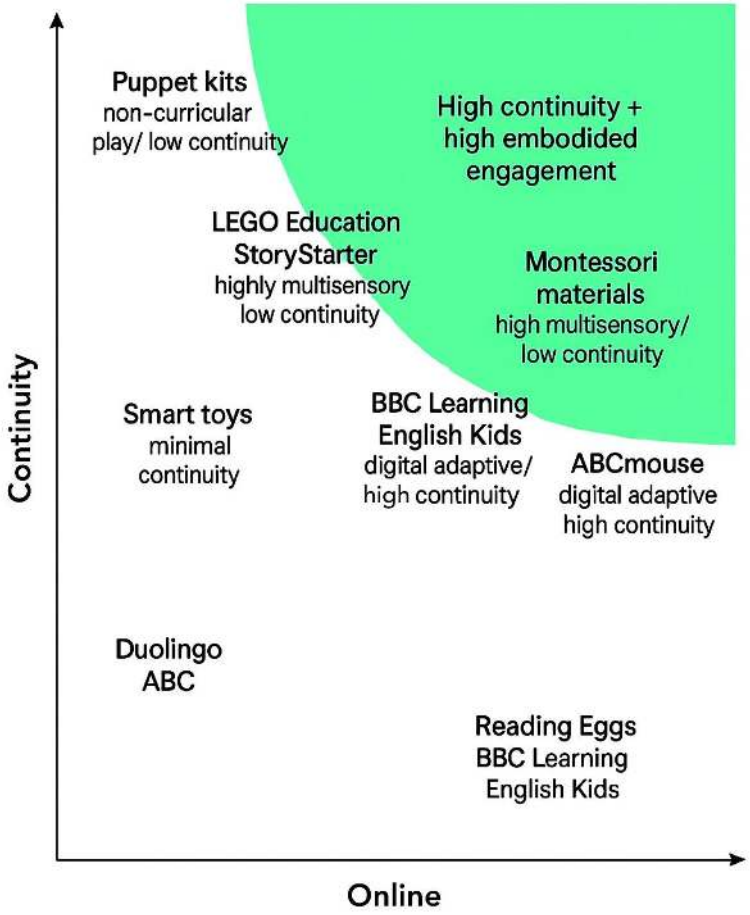
Narrative is not simply a container for content—it is a cognitive, emotional, and social mechanism through which children organise experience and construct identity (Bruner, 1996). Stories provide coherence, anchor memory, reduce cognitive load, and make communication meaningful (Egan, 1988). In the context of language learning, narrative gives vocabulary purpose, structure, and emotional resonance. Children learn not only what words mean but how they belong to a world of characters, intentions, feelings, and shared imagination.

Three narrative principles shaped this interpretative framework. First, familiarity and cultural grounding increase accessibility: children engage more deeply with recognisable figures, places, or emotional landscapes, especially those embedded in Italian cultural memory (Wells, 2009). Local stories reduce processing demands (Sweller, 1994) and offer emotional proximity. Second, stories are modular systems—characters, objects, and scenes can be recombined, reordered, or modified. This aligns with constructionist learning theories (Papert, 1980), where understanding grows through assembling parts, not memorising forms. Third, narrative supports identity work. When children reenact scenes, negotiate endings, or invent new roles, they explore emotions and social positioning (Nicolopoulou, 2014). In a second language, this provides a psychologically protected space to rehearse communicative identities.

The interpretative lens therefore treated narrative not as embellishment but as a structural foundation. It directly led to design decisions favouring episodic storytelling, manipulable narrative fragments, bilingual scripts, modular didactic progression, and character-mediated expression.

03. OPPORTUNITY MAPPING AND MARKET SYNTHESIS





03. OPPORTUNITY MAPPING AND MARKET SYNTHESIS

3.4 Ecological Continuity Between Home and School

One of the strongest interpretative insights emerged from ecological theories of learning. Bronfenbrenner's ecological systems model (1979) and Rogoff's sociocultural perspectives (2003) emphasise that learning unfolds across overlapping environments, roles, and material supports. For children aged 6–8, English learning is distributed across microsystems—classrooms, homes, extracurricular contexts—but these systems rarely share routines, artefacts, emotional tone, or mediation strategies. The research documented that discontinuity across settings interrupts reinforcement, undermines confidence, and produces a fractured experience of language.

This interpretative lens drew on several relevant models: Funds of Knowledge theory (Moll et al., 1992), which recognises the learning assets embedded in family life; Distributed Cognition (Hutchins, 1995), which examines how artefacts mediate knowledge flow; and continuity theory in early childhood (OECD, 2019), which stresses the importance of shared structures, rituals, and referential materials.

From this perspective, continuity emerged as a non-negotiable design imperative. To work effectively, the educational system must travel physically between environments; enable mirrored activities at home and in school; support bilingual scaffolding for parents; maintain emotional tone across transitions; adapt to diverse rhythms and spaces; and allow children to re-enter activities with familiarity rather than starting from zero.

This interpretative stance is directly responsible for the final kit's portability, modular episodic organisation, bilingual guidance, stable narrative anchors, and robust materiality capable of repeated movement between contexts.

3.5 Integration of Frameworks

Individually, each theoretical domain offered insight into a specific aspect of the design challenge. Taken together, they formed a coherent interpretative architecture capable of transforming raw field observations, parent and teacher perspectives, and benchmarking gaps into actionable design principles.

Embodied Cognition ensures that language becomes something children can manipulate, enact, and externalise physically. Affective grounding ensures that expression remains emotionally safe, playful, and non-judgmental. Narrative structure organises learning into meaningful worlds where identity, memory, and motivation can flourish. Ecological continuity ensures that learning does not collapse at the boundary between home and school.

CHAPTER 04

CONCEPT DEVELOPMENT

04.
CONCEPT DEVELOPMENT

The synthesis of findings marks the transition from research to design, consolidating the extensive evidence gathered in the Research Booklet—ethnographic observations, literature reviews, contextual analysis, user insights, pedagogical frameworks, and benchmarking—into a coherent conceptual foundation. Unlike a summary, this chapter explains the interpretative logic behind the design: why it is needed, how it emerged from empirical realities, and why the final system cannot be reduced to a stylistic preference or isolated artifact. Instead, the chapter establishes a clear conceptual argument for continuity-centered ESL design for young children.

Across the research, four thematic clusters emerged repeatedly: embodiment, emotional safety, narrative identity, and ecological continuity. Each cluster reveals a domain in which existing ESL practices for Italian children aged 6–8 remain insufficient, while simultaneously pointing toward design opportunities that the final system addresses in a systematic and materially grounded way.

4.1 Embodied Cognition as a Driver for Language Learning

Embodied Cognition provides a central theoretical basis for the design direction. A substantial body of evidence demonstrates that children learn and remember linguistic concepts more effectively when these concepts are enacted physically, rather than practiced solely through symbolic manipulation or passive exposure (Barsalou, 2008; Glenberg & Gallese, 2012). Gestures constitute part of semantic processing itself, supporting retention and fast access during recall (Hostetter & Alibali, 2008).

The fieldwork confirmed these principles vividly. Children struggled with abstract language when it was taught through worksheets, static images, or passive listening. When movement, actions, props, or mimetic enactment were introduced, participation rose sharply, attention cycles lengthened, and emotional tone shifted toward confidence and curiosity. Teachers consistently observed that "movement makes language stick," and children demonstrated natural transitions from hesitation to expression as soon as language was embodied in action.

Benchmarking further revealed that many existing products fail to meaningfully support embodiment. Flashcards and worksheets encourage recognition, not enactment. Digital apps reduce bodily engagement to tapping or swiping and often disconnect children from shared material spaces. Puppet-based or symbolic tools promote play but rarely structure linguistic progression or portability across environments.

This synthesis identified a clear design opportunity: linguistic content must be embedded in manipulable materials, bodily actions, spatial relationships, and sensorimotor engagement. This interpretative insight directly informed the later focus on detachable gesture silhouettes, stencil functionality, shadow-based enactment, and the modular tile system that connects vocabulary with movement and storytelling.

4.2 Emotional Safety and the Reduction of Performance Anxiety

The affective dimension of language learning emerged as equally central. Research in language anxiety demonstrates that fear of error can significantly inhibit participation and dampen linguistic willingness—even in early childhood (MacIntyre & Gardner, 1994; Krashen, 1982). Emotional safety is therefore not ancillary; it is essential for sustained learning and expressive willingness.

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Field data showed that children often avoided speaking English when they expected evaluation or public correctness. Emotional inhibition was most visible during tasks requiring direct pronunciation, immediate recall, or individual performance in front of peers. Teachers and parents repeatedly described children as "shy," "afraid to be wrong," or sensitive to peer visibility.

Developmental literature confirms that indirect expression—using characters, puppets, silhouettes, or imagined roles—creates psychological distance, enabling children to communicate ideas and emotions without exposing their identity (Immordino-Yang & Damasio, 2007). Symbolic representation also increases emotional safety by making mistakes part of the narrative rather than personal error (Bodrova & Leong, 2007).

The synthesis therefore established several design requirements: children must be able to speak and act through symbolic characters; mistakes must be normalised through playful experimentation; and materials must provide a calm, gentle atmosphere that reduces pressure. These insights directly shaped decisions about silhouettes, puppetry, soft tactile materials, and character-mediated narration, allowing children to animate meaning rather than perform it as themselves.

4.3 Narrative Identity and Cultural Anchoring

Narrative emerged as a structural foundation for design. Developmental psychology shows that children organise memory, emotion, and symbolic understanding through story (Bruner, 1996; Nicolopoulou, 2014). Stories provide continuity, motivation, and coherence across episodes, making them particularly suited for second-language learning. They allow vocabulary, grammar, and communicative functions to exist within meaningful interactions rather than isolated drills.

Field observations confirmed that children displayed far greater engagement when English was embedded within recurring characters, episodic frames, or performative scenes. Teachers reported that "something that continues each week" dramatically improved motivation and coherence, while disconnected tasks were harder to sustain.

Benchmarking revealed strong narrative worlds in children's media and strong embodied interaction in craft toys, yet almost no product integrated narrative modularity with linguistic progression, portability, and embodied manipulation. Storybooks were narratively rich but passive; ESL kits were active but rarely narrative.

Cultural anchoring also stood out as crucial. Familiar stories—such as Pinocchio—provide immediate emotional and cognitive access because they are already part of children's symbolic landscape. This reduces cognitive load (Sweller, 1994), strengthens emotional resonance, and facilitates identity work.

Thus, the synthesis concluded that ESL learning must be embedded within a culturally meaningful, modular narrative structure where characters, objects, and episodic scenes are manipulable and performable. This insight directly shaped the tile system as narrative fragments, the episodic didactic plan, and the design of symbolic character mediation.

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4.4 Ecological Continuity Across Home and School

The research repeatedly highlighted that English learning for young children unfolds across multiple environments—school, home, extracurricular contexts—but these environments rarely align. Teachers plan structured lessons; parents improvise within daily routines. Classroom expectations and emotional tone differ from home interactions, and the material tools do not circulate across contexts. This fragmentation disrupts reinforcement, weakens confidence, and creates instability in how children interpret English (Bronfenbrenner, 1979; Rogoff, 2003).

User insights indicated concrete needs: materials must move easily between home and school; narrative worlds should remain recognisable in both contexts; bilingual mediation must support parents with low English proficiency; and episodic structures must allow children to continue or revisit learning without starting again from zero.

Benchmarking confirmed that no ESL product meaningfully synchronises home and school ecologies. Digital tools may travel as login systems, but they lack tangible anchors and embodied interaction. Worksheets travel physically but do not sustain emotional safety, narrative continuity, or multimodal participation. Play-based products excel at creativity but lack didactic coherence and do not scaffold continuity.

This interpretative stance made continuity a structural requirement rather than an optional feature. The design therefore prioritised: lightweight, portable materials; bilingual adult guidance; mirrored activities for school and home; and episodic narrative cycles that can open in one environment and close in the other. These decisions support ecological coherence and help children experience English as a stable world rather than fragmented episodes.

4.5 Inclusivity, Accessibility, and Material Practicality

Practical constraints also informed design direction. Classrooms have limited time, shared storage, and fixed schedules; families have variable resources, space, and linguistic confidence. Parents prefer materials that do not require new apps, subscriptions, or expensive add-ons. Schools vary in budget, and teachers need materials that are flexible, durable, and easy to manage.

Research on inclusive and child-centered material design in low-resource contexts (UNESCO, 2015; UNICEF, 2021) emphasises affordability, replicability, repairability, and minimal technological dependence. These conditions are not peripheral—they are essential for equitable access.

The synthesis therefore concluded that components must be flat, uniform, printable, and light; duplication must be easy; replacement must be achievable without specialised tools; and the system must avoid fragile or high-cost elements. These insights informed the replicable tile dimensions, printable silhouettes, bilingual prompt cards, and low-tech embodied tools that function without digital infrastructure, helping the system remain both scalable and culturally adaptable.

4.6 Integration of Findings into a Design Direction

Taken together, these thematic clusters provided a clear and coherent design trajectory.

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CONCEPT DEVELOPMENT

The emerging system must engage children's bodies through manipulable and gestural materials; protect emotional wellbeing by enabling expressive indirection; embed linguistic progression within a culturally meaningful narrative structure; bridge school and home through mirrored activities and stable artefacts; and remain accessible, printable, affordable, and low-tech.

This integrated synthesis is what enabled the design proposition in Chapter 5: a continuity-centered bilingual tile system that supports embodied, narrative English learning in a stable emotional and ecological frame. The synthesis does not merely precede the design—it justifies it. Each element of the final prototype is a direct operationalisation of research-derived insights, ensuring that the system is materially grounded, pedagogically coherent, developmentally aligned, and emotionally safe for young learners.

CHAPTER 05

THE EMERGING DESIGN PROPOSITION

05.
THE EMERGING DESIGN PROPOSITION

The Emerging Design Proposition represents the moment in which research findings, user insights, educational constraints, and contextual observations begin to converge into a stable design direction. Positioned between the interpretative work of the Research Booklet and the constructive work of the Design Booklet, this chapter articulates how the final system arose from evidence rather than intuition. Instead of proposing a preconceived solution, it reconstructs the conceptual logic, tensions, and decision-making processes that gradually shaped the educational kit.

Through iterative synthesis—combining ecological analysis, developmental theory, user behaviour, and the structural limitations of existing ESL resources—the proposition emerged not as a digital upgrade or a curricular add-on, but as a continuity-centered, narrative-based, embodied learning system. The following sections trace how the concept came into focus, step by step, showing its direct relationship to the empirical and theoretical foundations established earlier.

5.1 From Problem Space to Opportunity Space

The study began with a clear structural problem: although abundant ESL resources exist for children aged six to eight, learning remains fragmented across home and school. Reinforcement is inconsistent, emotional tone fluctuates, and children do not retain a coherent sense of English as something that travels with them. Literature in socio-ecology and early learning repeatedly highlights these systemic fractures (Bronfenbrenner, 1979; Rogoff, 2003). Teachers and parents echoed these concerns in early conversations: "Children practise differently at home," "Parents don't know how to support English," and "We cannot extend class activities into families."

The research reframed these challenges not as individual shortcomings but as ecological misalignment. Instead of blaming children, parents, or teachers, the focus shifted toward designing artefacts and interaction rituals capable of stabilising meaning across environments. From this shift, several opportunity domains emerged.

First, embodied meaning-making needed to be central. Research in embodied cognition shows that gestural action, manipulation, and sensorimotor engagement significantly improve semantic grounding in young learners (Barsalou, 2008; Glenberg et al., 2004). Existing ESL materials rarely support this.

Second, expressive pressure needed to be reduced. Language anxiety affects children at an early age (MacIntyre & Gardner, 1994), and many children are reluctant to speak when mistakes feel visible. A design solution would require expressive indirection.

Third, learning needed to be anchored in culturally meaningful narratives. Children think and remember through story structures (Bruner, 1996; Nicolopoulou, 2014), and culturally familiar tales such as Pinocchio ease cognitive load and deepen recognition.

Finally, learning needed to travel physically and symbolically between environments. Continuity depends on artefacts and structures capable of moving fluidly between school routines and family life (Barron, 2006; Moll et al., 1992).

These opportunity domains suggested a clear direction: a narrative-driven, low-tech, embodied learning kit that integrates continuity by design, allowing children to rehearse language through performative storytelling in any setting.

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5.2 Synthesis of Design Criteria

The next stage involved consolidating research insights into a structured set of design criteria. Rather than abstract principles, these criteria served as both constraints and generators, ensuring that early prototypes remained aligned with developmental theory, field observation, and ecological need.

The first requirement was embodiment and material engagement. The system needed to rely on physical manipulation, gestural enactment, and spatial organisation, reflecting the role of bodily interaction in semantic retention (Glenberg, 2010). It also needed to support tracing, drawing, and shadow-based enactments to deepen motor–linguistic coupling.

The second requirement involved emotional safety and expressive indirection. Children must be able to speak through characters rather than as themselves; mistakes should be normalised through play; and materials should possess an approachable, non-evaluative aesthetic. These conditions reduce anxiety and facilitate expressive willingness (Krashen, 1982).

The third requirement concerned narrative coherence and cultural familiarity. The system needed to draw from a recognisable story world, allow children to reinterpret, and present modular story fragments that can be recombined. Narrative engagement becomes a scaffolding for linguistic progression and emotional identification.

The fourth requirement addressed ecological continuity. Activities must have mirrored versions for home and classroom. Artefacts must be portable and replicable. Adults must be supported through bilingual mediation, giving parents confidence without requiring advanced English skills.

The fifth requirement centred on accessibility and replicability. The solution must be printable, repairable, affordable, and uniform in structure. No digital devices should be required. Components need to be light, durable, and reproducible to ensure equitable access.

These criteria were not theoretical aspirations; they emerged directly from user frustrations, observational evidence, and recurrent gaps in existing offerings. They guided all subsequent conceptual refinement.

5.3 Analysis of Existing Solutions (Benchmarking)

The benchmarking phase compared a wide range of current offerings—flashcards, worksheets, puppet kits, storytelling resources, and digital language platforms—against the design criteria.

Flashcards and worksheets demonstrated strong content structure but remained static, lacking embodied engagement or narrative coherence. They reinforced memorisation but not expressive willingness.

Mobile apps and digital games delivered micro-lessons but escalated screen dependence, limited adult participation, and offered minimal ecological portability. Their continuity across environments was symbolic rather than embodied.

Puppet kits and craft resources supported expression, role-play, and emotional participation but lacked bilingual scaffolding and linguistic progression. Most were dependent on teacher facilitation and not designed to circulate between contexts.

05.
THE EMERGING DESIGN PROPOSITION

Storybooks provided narrative richness but remained primarily passive, limiting opportunities for manipulation, co-authoring, or embodied enactment.

Across this spectrum, no product meaningfully integrated embodiment, narrative modularity, bilingual mediation, portability, and continuity. This gap confirmed that continuity is not a single missing feature but a structural absence across the market.

5.4 Conceptual Evolution: From Directions to Propositions

Early design experiments explored multiple conceptual pathways.

One direction involved a gesture-enhanced storybook. It offered narrative clarity and recognisable content but lacked sufficient manipulation and ecological continuity.

A second direction involved a classroom puppet theatre. It supported expressive role-play and affective engagement but was not portable, reproducible, or easily adapted to family settings. It relied heavily on teacher facilitation.

A third direction tested object-based story tiles. They offered portability, modularity, and narrative recombination, but initial versions did not integrate gestures strongly enough.

A fourth direction combined origami, silhouettes, and tiles into a mixed-system toolkit. This approach supported multisensory activity, creativity, and printing flexibility but required stronger didactic scaffolding and clearer continuity structures.

Through iteration and alignment with design criteria, the strongest proposition became clear: a modular narrative tile system with detachable silhouette gestures, accompanied by a bilingual didactic plan, usable seamlessly across home and school.

This direction addressed embodiment, emotional safety, narrative identity, ecological continuity, and accessibility in a single coherent system.

5.5 The Proposition: A Continuity-Centered Storytelling Kit

The emerging proposition became the conceptual backbone of the final design:

A modular educational kit that enables children to learn English by manipulating, enacting, and retelling culturally familiar stories through embodied, bilingual, cross-environment play.

The system is embodied, requiring movement, stencil tracing, gesture enactment, and tactile manipulation. These activities reflect strong embodiment research and align with how children naturally externalise meaning.

It is culturally grounded. Familiar stories such as Pinocchio offer emotional resonance and shared recognition across family and school settings.

It is emotionally supportive. Children speak through characters, reducing linguistic anxiety and allowing expression without self-exposure.

It is ecologically continuous. Tiles, episodic scripts, origami props, and silhouette gestures move between contexts without reconfiguration, enabling children to continue activities at home or resume them at school without losing coherence.

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THE EMERGING DESIGN PROPOSITION

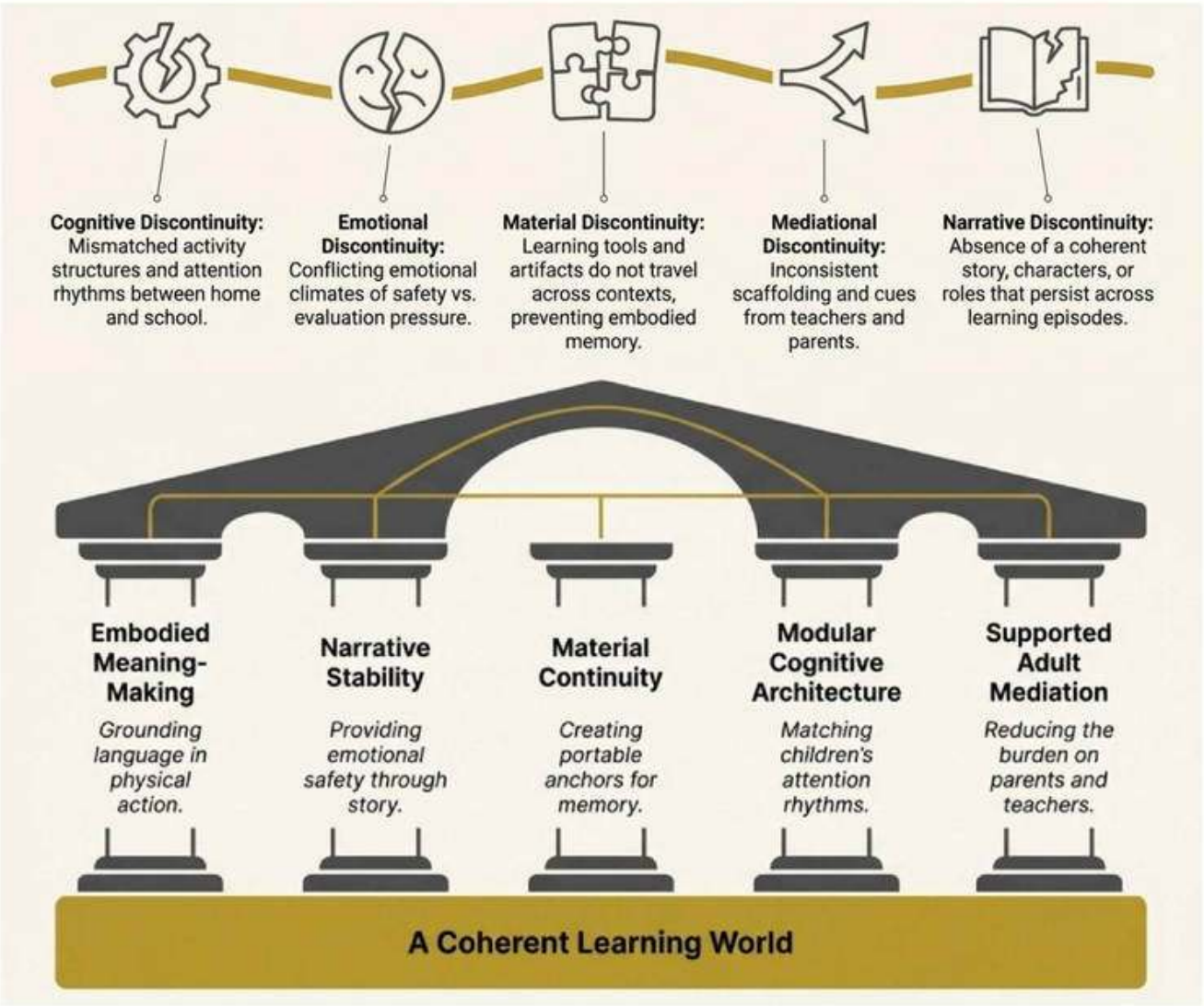
It is scalable and repairable. Printable components, inexpensive materials, and uniform tile dimensions allow easy reproduction, replacement, and adaptation across diverse families and classrooms.

The proposition is therefore not speculative but structurally inevitable. It emerged from the alignment between user needs, developmental evidence, ecological constraints, and market absence.

5.6 Readiness for System Definition

At the close of this chapter, the conceptual proposition had reached a level of maturity that enabled formal system definition and prototyping. The design was ready to move beyond conceptual exploration into specification: identifying final artefacts, their material logic, the continuity model, and the narrative structure that would sustain practice across environments.

Chapter 6 develops this system in detail, translating the proposition into a coherent educational kit where storytelling, embodiment, bilingual mediation, and ecological continuity become the operative foundations of a new approach to early English learning for Italian children.



CHAPTER 06

THE FINAL DESIGN: EDUCATIONAL KIT PROPOSAL

06. THE FINAL DESIGN: EDUCATIONAL KIT PROPOSAL

6.1 System Overview

The final design brings together the conceptual foundations, pedagogical requirements, and ecological insights established throughout the research into a unified educational kit for Italian children aged 6–8 learning English as a second language. Instead of relying on a single artefact, the kit acts as a product–service ecosystem composed of three interconnected layers: a tangible set of modular materials, a didactic plan that structures their unfolding across time, and mediation tools supporting adults in maintaining continuity between home and school. These layers operate collectively, transforming language learning into a practice of embodied storytelling that can occur anywhere.

A narrative spine inspired by culturally familiar stories—such as Pinocchio—anchors the system. The choice is not merely aesthetic: children in this age group understand relationships, emotions, intentions, and temporal sequences more easily when activities are embedded in recognisable narrative structures (Bruner, 1996; Nicolopoulou, 2014). Familiar stories reduce the cognitive effort required to enter new activities, allowing attention to focus on linguistic use, gestural action, emotional interpretation, and collaborative play rather than on deciphering an unfamiliar fictional universe. The narrative is divided into short episodic units that can be introduced in class, revisited at home, and re-integrated in subsequent school sessions.

The physical core consists of a series of square tiles—approximately 5–7 cm—constructed from durable yet soft laminated card. Each tile presents a visual icon alongside a detachable silhouette layer. Icons carry clear pictorial representations of characters, objects, actions, and high-utility vocabulary; silhouettes support gesture, tracing, drawing, and shadow play. A small axial slot enables silhouettes to slide onto ordinary pencils or thin sticks, transforming familiar stationery into character holders, puppet handles, or gesture wands. The tiles thereby act as portable micro-interfaces for manipulating story fragments, rehearsing verbs, constructing scenes, and expressing meaning through embodied interaction.

Around these tiles, the system incorporates expressive extensions that broaden learning modalities. Origami sheets linked to story moments allow children to construct simple props. Backdrop cards provide small scenic environments for collective retellings or classroom theatre. Slim envelopes or pockets make tiles easy to carry between school and home. A compact bilingual guidebook supports teachers and parents with episode scripts, vocabulary prompts, and adaptation suggestions for different attention levels, confidence levels, and time constraints. All components fit inside a thin, portfolio-like container, reinforcing the idea of an everyday learning resource rather than a delicate, special-occasion object.

A deliberate design decision is to remain screen-free. Earlier stages of the research established that devices often promote passive consumption, isolated performance feedback, or evaluative metrics that heighten anxiety. The kit instead encourages shared physical space, collaborative attention, and co-present interaction. Learning is enacted through material manipulation, embodied rehearsal, and dialogue between adults and children—not through navigating interfaces or engaging in solitary screen tasks.

The kit is conceived as a platform rather than a closed set. While the thesis prototype focuses on a single narrative cycle and a limited repertoire of tiles, the architecture supports expansion.

06. THE FINAL DESIGN: EDUCATIONAL KIT PROPOSAL

Further stories, characters, and thematic units can be introduced without altering the core logic, maintaining a structure that remains scalable over time and transferable to other languages and cultural contexts.

6.2 Kit Components

The kit's components can be understood as belonging to three functional families: narrative tiles, embodied extensions, and mediation tools. Each responds to distinct ecological and pedagogical needs, while remaining interoperable with the rest of the ecosystem.

Narrative Tiles

Narrative tiles form the core representational vocabulary. Character tiles depict recurring figures from the story world—Pinocchio, Geppetto, the Fairy, the cricket—each with a stable visual identity and an accompanying English label. Object tiles represent high-utility items such as apples, lanterns, sticks, or satchels, enabling vocabulary to connect directly to familiar routines and episodic moments. Action tiles foreground gestures and verbs—run, hide, give, carry, listen—combining iconography and silhouette prompts that invite children to enact the depicted movement. The uniform square format allows tiles to be arranged in grids, sequences, clusters, or dramatic configurations without visual fragmentation.

Embodied Extensions

Embodied extensions transform the tiles into instruments for performance, tracing, and shadow play. Detachable silhouettes can be mounted on pencils to animate characters during storytelling or to create symbolic performance above the page. In classroom settings, silhouettes can be projected against a wall or portable screen, turning everyday environments into miniature shadow-theatre stages. At home, children can trace silhouettes on paper, use them as stencils to create drawings, or combine them with origami props to expand narrative possibilities. These extensions respond directly to research showing that physical manipulation and gesture are central to semantic encoding and linguistic memory (Barsalou, 2008; Glenberg, 2010).

Mediation Tools

Mediation tools support adults in guiding activities and sustaining continuity. A bilingual booklet—Italian and English—explains the pedagogical rationale in accessible language and outlines episodic structures with step-by-step prompts, activity variants, and suggestions for emotional regulation or confidence-building. Episode cards condense these instructions into small, portable cues that can stay on a teacher's desk or at home on a refrigerator, making engagement easy without consulting the full guide. Informal observation sheets help adults notice emerging vocabulary, favourite tiles, confidence patterns, or emotional shifts without turning learning into formal evaluation.

Materially, every element is designed for durability, repairability, and ease of duplication. Tiles can be reprinted using standard card stock and basic printers; silhouettes and origami sheets can be photocopied from included templates; envelopes and backdrop cards can be replaced without specialised materials. Instead of treating the kit as a scarce, fragile product, the design encourages modification, replacement, and co-creation, reducing anxiety over "ruining" or losing components and enabling equitable use in diverse school and home environments.

06.
THE FINAL DESIGN: EDUCATIONAL KIT PROPOSAL

6.3 Why This Form?

This material configuration is not stylistic—it is a grounded response to the full set of research conclusions on embodiment, emotional safety, narrative identity, and ecological continuity.

Embodied cognition demonstrates that gestures and object manipulation participate actively in language processing and semantic encoding (Barsalou, 2008; Glenberg, 2010). Traditional ESL tools for this age group isolate vocabulary through flashcards, worksheets, or screen-based tasks, leaving meaning abstract and disconnected from physical action. In contrast, the tile system is intentionally gesture-dependent: children hold tiles, move tiles, mount silhouettes, animate objects, and enact verbs with their hands. Everyday writing tools become puppet handles and gestural supports, embedding meaning into the child's familiar material world.

The system also addresses emotional safety. Young learners often experience anxiety when speaking a second language, especially in visible moments of pronunciation or recall (Immordino-Yang & Damasio, 2007; MacIntyre & Gardner, 1994). Indirect expression—through characters, silhouettes, drawn scenes, or shadow theatre—creates psychological distance. Children can experiment, exaggerate, or make mistakes through the character rather than as themselves. The aesthetic strategy, using clear line work and soft accents, reduces overstimulation and avoids infantilising imagery, reinforcing the child's sense of competence.

Narrative offers cognitive and emotional scaffolding. Children organise memory, temporal progression, and symbolic thinking through stories, and familiar story universes allow them to enter linguistic practice with minimal interpretative effort (Bruner, 1996; Nicolopoulou, 2014). A modular story world where tiles function as recombinable fragments supports both canonical retelling and personal creativity: scenes can be re-enacted, extended, or transformed. This modularity turns narrative into a structural mechanism for sustained engagement and identity work.

The uniform, medium-scale tile format balances tactile usability, storage limitations, and inclusive accessibility. Tiles are large enough for easy handling, readable enough for group work, and compact enough for transport. The detachable silhouette layer adds expressive depth without complicating the overall architecture. Remaining low-tech and printable supports equitable access and avoids dependencies on device ownership, connectivity, or proprietary software.

6.4 Design for Continuity

Continuity between home and school is not peripheral but foundational. The research demonstrated that early language learning unfolds across multiple micro-settings—desks, carpet circles, living rooms, kitchen tables—and that discontinuity between these settings inhibits confidence, retention, and emotional safety (Bronfenbrenner, 1979; Rogoff, 2003). The final design treats continuity as a structural design condition.

Materials support continuity through portability and duplicability. Classroom sessions introduce episodes or vocabulary through shared enactment; selected tiles, origami props, or silhouette characters can then travel home in slim envelopes.

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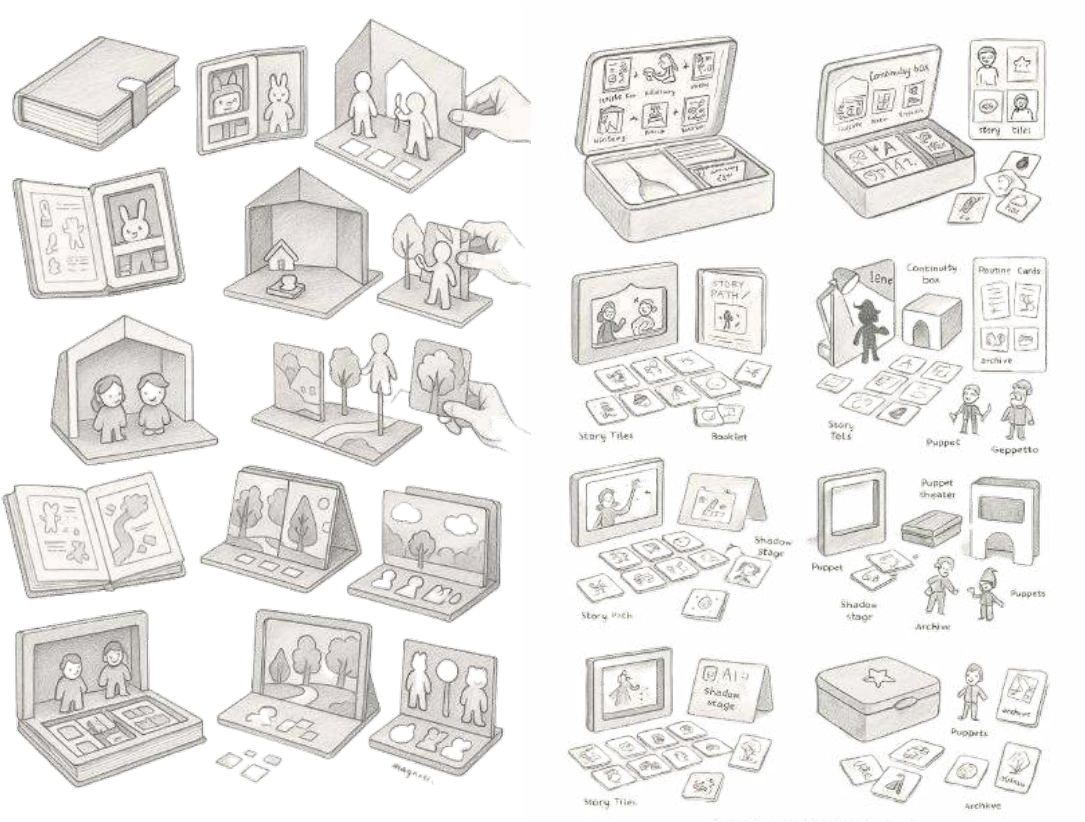
Children bring not just an object, but a story to continue: a role, a mission, a partially folded prop, or a question unresolved in class. At home, the same artefact re-opens the narrative world, encouraging retelling, improvisation, and embodied rehearsal. Parents can join even with limited English proficiency because the bilingual guide provides gentle scaffolding.

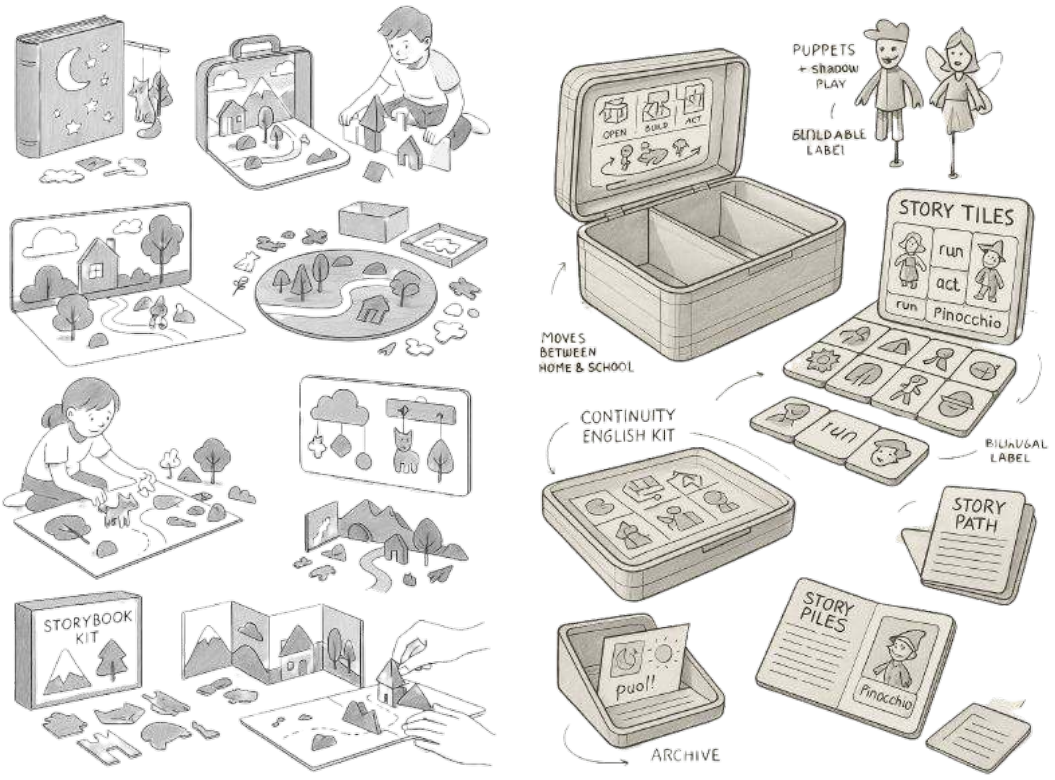
Practice continuity is sustained through parallel structures. Classroom sessions emphasise collective storytelling, group movement, and shared linguistic exploration. Home sessions invite quieter, personalised forms of narration—bedtime dialogues, drawing scenes using tiles as stencils, or performing brief exchanges during everyday routines. The guidebook prompts parents to reference classroom events, while teachers invite children to bring back drawings or tile arrangements created at home. These cross-references prevent fragmentation: each environment recognises and extends what the other has already built.

Continuity is also relational. The kit reframes adults not as evaluators but as co-narrators and facilitators who help maintain a shared emotional climate. Accessible explanations in the guidebook clarify why specific activities matter: why repeating gestures supports memory, why silhouettes reduce anxiety, and why narrative modularity strengthens engagement. Shared understanding reduces inconsistencies between settings and respects the time rhythms and emotional dynamics of both school and home.

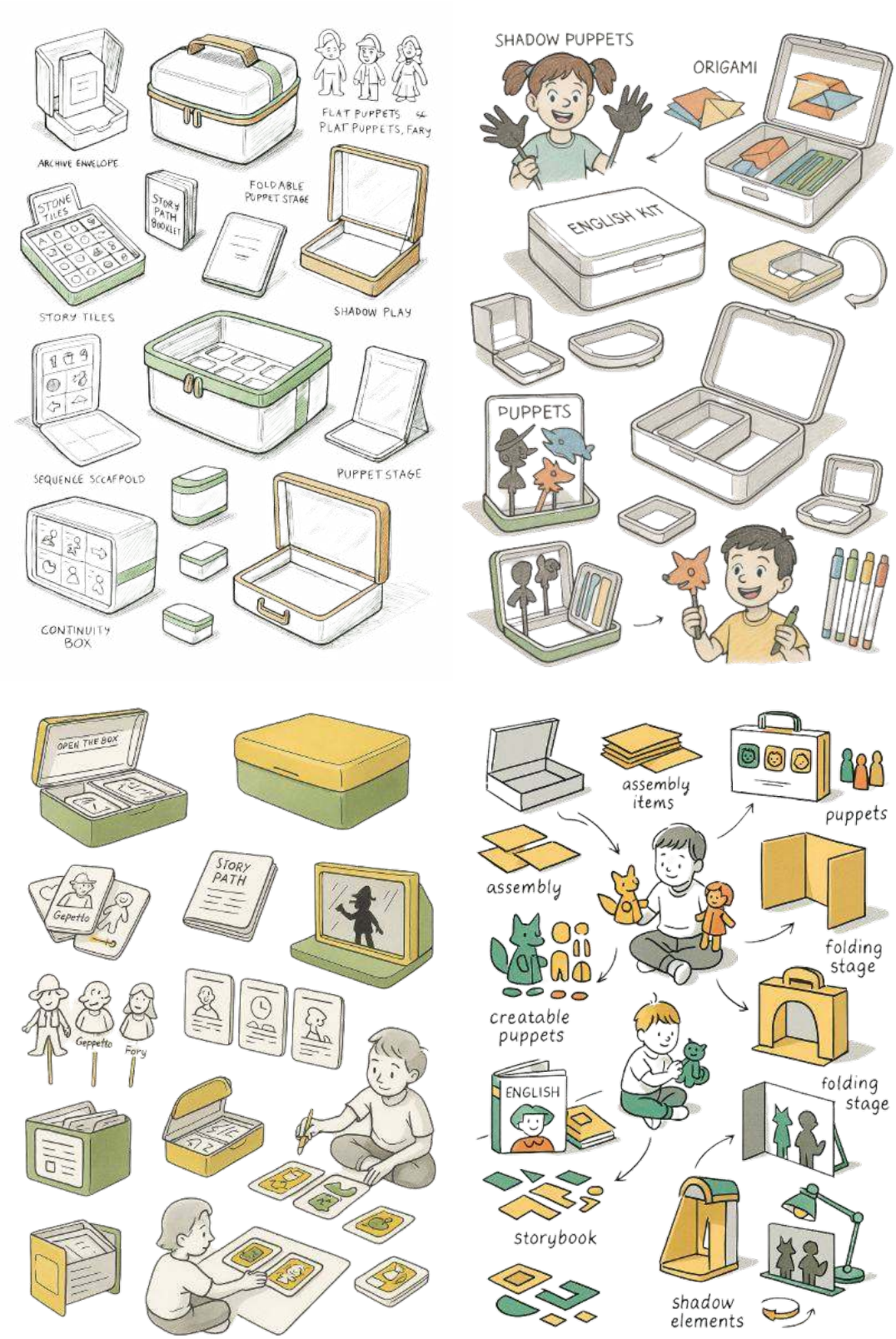
In this form, the final design acts as a hybrid educational system: narrative-driven, materially grounded, and pedagogically structured. The kit remains low-cost, repairable, printable, and scalable; its narrative openness enables expressive creativity; its mediation tools support pedagogical reliability; and its portability creates ecological coherence across children's lived environments. The following chapters articulate the didactic plan, user journeys, and prototyping strategy, illustrating how this design operates in practice and how it can be iterated and evaluated in future work.

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THE FINAL DESIGN: EDUCATIONAL KIT PROPOSAL





06.
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CHAPTER 07

DIDACTIC PLAN (PEDAGOGICAL ALIGNMENT)

07.
DIDACTIC PLAN (PEDAGOGICAL ALIGNMENT)

The didactic plan transforms the kit from a set of materials into a teachable and repeatable pathway for early English learning. It defines how the system is used across time, what linguistic and cognitive goals it supports, how it sustains continuity between home and school, and how adults can mediate the activities in ways that are playful, emotionally safe, and developmentally sound.

Rather than replacing existing curricula, the plan operates as a modular narrative layer that integrates into early-primary English programmes aligned with the Italian Indicazioni Nazionali per il curricolo (MIUR, 2012, 2018) and early CEFR bands for young learners (Pre-A1–A1/A2) (Council of Europe, 2020). Its pedagogical roots draw from multiple strands of research: embodied cognition (Barsalou, 2008; Glenberg & Gallese, 2012), young learner ESL methodologies (Cameron, 2001; Lightbown & Spada, 2013), narrative-based teaching (Bruner, 1996; Nicolopoulou, 2014), and ecological models addressing continuity across learning environments (Bronfenbrenner, 1979; Rogoff, 2003).

The kit does not attempt to cover every linguistic structure. Instead, it focuses on high-frequency verbs and familiar nouns embedded in scenes from culturally meaningful stories such as Pinocchio. Each tile represents a discrete learning unit—a character, object, gesture, or thematic moment—that is connected to the didactic plan and can be enacted, traced, shadowed, retold, and recontextualised through detachable silhouettes and props. These units are recombined into short episodes that can be played in the classroom and reopened at home, forming the core rhythm of the learning process.

7.1 Curriculum Logic

The didactic logic is organised around episodic storytelling, progressive linguistic complexity, and repetition through variation. It is intentionally flexible: teachers can adapt pacing, sequencing, and length while maintaining a stable narrative progression.

Every episode is built around three integrated elements:

- a short moment from the story world (e.g., Pinocchio wakes up and explores his room; Pinocchio walks to school and meets a friend);
- a targeted set of linguistic items (basic verbs such as look, give, run, sit and concrete nouns such as apple, book, stick, door);
- a visible configuration of tiles, silhouettes, and props that materialises the story, its characters, and its vocabulary.

This pattern reflects research on story-based language learning, where recurring narrative situations create natural opportunities for practising vocabulary and grammar without isolating them in abstract drills (Wright, 1995; Ellis & Brewster, 2014). It also echoes work on repeated readings, which shows that revisiting the same story with small variations deepens comprehension and retention in early childhood (Wells, 2009).

Episodes unfold through a three-stage rhythm:

1. Pre-episode activation – children revisit familiar tiles, re-enter the previous story, and anticipate what might happen next.
2. Embodied enactment – new tiles are introduced and the episode is enacted through gesture, tile manipulation, shadow play, or collaborative scene-building.
3. Reflection and transfer – children draw, retell, or modify the scene, often preparing a piece that will travel home.

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These episodes align naturally with the objectives of the Italian primary curriculum: simple oral comprehension, basic expressive ability, recognition of everyday vocabulary, routine-based exchanges, and spatial and social language (MIUR, 2012; Council of Europe, 2020). Selected tiles—characters like Pinocchio, objects such as apples or lanterns, and common gestures—are positioned at the intersection of curricular vocabulary, embodied potential, and narrative meaning.

As the cycle develops, episodes gradually introduce more complexity: from isolated actions and objects toward short exchanges, multi-step routines, and simple forms of tension or suspense. Still, the underlying principle never changes: linguistic practice is always anchored in a manipulable, visible, emotionally meaningful configuration of materials. This consistency preserves cognitive grounding and emotional safety across the entire arc of learning.

7.2 Home–School Alignment

A defining purpose of the didactic plan is to repair the lack of continuity between home and school that emerged repeatedly during the fieldwork (Bronfenbrenner, 1979; Rogoff, 2003). Instead of treating home as a space for isolated homework, the design treats every episode as a two-part learning cycle with mirrored versions for classroom and home environments.

In the classroom, the teacher uses the full set of tiles and silhouettes. Children enact the story collectively, negotiate meaning, rehearse gestures, and experiment with short exchanges. At the end of the session, a small fragment—such as a photocopied tile, a detachable silhouette, a drawing created with a stencil, or a partially folded origami prop—is selected to travel home in a slim envelope or notebook pocket. A bilingual prompt accompanies the fragment, linking the classroom story to everyday life. For example, after a story where Pinocchio eats an apple and hurries to school, the prompt might invite the child and parent to create a similar morning scene using shadows, drawing, or play.

At home, activities are deliberately short, informal, and pressure-free. The prompts anticipate the wide variation in households: limited time, limited materials, different adult linguistic confidence, and different emotional rhythms (Sénéchal & LeFevre, 2002; OECD, 2019). Parents are invited to interact by asking the child to "show with the tiles," rather than by demanding grammatically correct sentences. The goal is participation, not performance.

When children return to school, the artefact—whether a drawing, a tile arrangement, a personal variation of the story, or even an oral description—is welcomed into the next episode. Teachers revisit and extend it, allowing home contributions to influence how the next scene unfolds. This reciprocity transforms continuity into an active narrative loop: the story does not reside in one environment but evolves across both.

This sequence embodies ecological models of distributed learning, where artefacts, roles, and meaning-making travel between settings (Hutchins, 1995; Barron, 2006). Instead of differentiating school and home, the didactic plan treats them as one extended learning ecology sustained through portable narrative fragments.

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7.3 Role of Adults (Teachers and Parents)

Adults function not only as facilitators but as emotional and narrative co-participants. Their relational stance shapes how confident, expressive, or hesitant children become when using English (Krashen, 1982; Edwards & Mackenzie, 2018).

For teachers, the kit operates as a pedagogical instrument that integrates into existing lesson plans without requiring formal restructuring. The bilingual booklet explains the rationale for embodied storytelling, provides episode scripts written like short theatrical cues, and suggests classroom variations according to group dynamics, confidence levels, and available time. Teachers orchestrate attention, introduce tiles gradually, and create a climate where experimentation is framed as narrative play rather than linguistic correctness.

For parents, the plan reframes English learning as a shared activity, not as homework. They are encouraged to participate as curiosity partners—asking questions, supporting simple performances, drawing with stencils, or joining a brief shadow scene. Explanations in the booklet are always bilingual, concise, and accessible, allowing parents with limited English proficiency to participate confidently. This reflects research showing that emotional support and shared enjoyment are more predictive of sustained engagement than accuracy in early stages (Immordino-Yang & Damasio, 2007; MacIntyre & Gardner, 1994).

The plan explicitly avoids treating parents as substitute teachers. Instead, it proposes activities that fit routine family life: two minutes before dinner, a bedtime shadow show, or a quick drawing using a tile silhouette. The aim is for English to feel present and alive in the child's everyday world, not confined to the classroom.

Transparency also plays a pedagogical role. The booklet explains why gesture enhances retention, why performing through Pinocchio reduces anxiety, and why familiar narratives support comprehension. When adults understand the purpose behind these moves, they feel more confident and more capable of sustaining them.

7.4 Activities: Structured and Free

The didactic plan balances structured activities—ensuring clear linguistic goals—with free activities that leave room for play, imagination, and self-expression. Both use the same components: tiles, detachable silhouettes, pencils, origami sheets, and backdrop cards.

Structured activities follow a recognisable classroom pattern. A teacher might introduce tiles representing Pinocchio, an apple, and the verb eat, guiding children to place them in sequence while repeating a short phrase: "Pinocchio eats an apple." The silhouette can then be mounted on a pencil and enacted by children, individually or in small groups. Later, silhouettes can be projected as shadows, with the teacher modelling simple exchanges or questions. This structure reflects best practices in young learner pedagogy, where repetition emerges from meaningful routines rather than decontextualised drilling (Cameron, 2001; Lightbown & Spada, 2013).

Free activities occur when children recombine tiles and gestures in imaginative ways. A child might draw a different fruit using a stencil, invent a short narrative where Pinocchio shares food with a friend, or build an origami lantern for the shadow scene. These explorations are validated as contributions to the evolving story world, not as digressions.

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Such flexibility supports creativity, identity work, curiosity, and ownership (Papert, 1980; Resnick & Rosenbaum, 2013).

At home, structured interactions are simple: prompts like "Can you show me the apple?" or "Can you make Pinocchio run?" using whichever fragment travelled home. Free activities might include bedtime storytelling, shadow projection with a desk lamp, or mixed-language narration. The plan accepts translanguaging—children mixing Italian and English—as a natural developmental phase that supports confidence building (Garcia & Wei, 2014).

Across both settings, a core principle remains: the same materials support recognition, repetition, enactment, retelling, and creation. The didactic plan proposes examples but encourages adaptation, as long as embodied narrative practice and emotional safety remain central.

7.5 Assessment and Reflection Framework

Assessment is intentionally formative, gentle, and ethically aligned. The plan avoids competitive evaluation, performance metrics, or high-stakes testing. Instead, it supports teachers, parents, and children in noticing growth, confidence, curiosity, and expressive evolution.

Teachers use qualitative observation: noting which children begin to gesturally express new verbs, who shifts from silent gesture to supported verbalisation, who invents new variations, or who displays growing emotional ease. Short reflective notes after each episode help trace participation, emerging vocabulary, emotional patterns, and any recurring challenges. This aligns with formative assessment principles in early language learning (Black & Wiliam, 1998; Council of Europe, 2020).

Parents are offered very light reflection prompts, such as "Did your child return to the tiles independently?" or "Did any English words appear during routine play?" These can be shared informally with teachers. The intention is not to evaluate performance but to notice whether English feels integrated into daily life.

Children engage in self-reflection through simple symbolic means: selecting a tile that represents their favourite moment, adding a small drawing or smiley next to an activity, or—when confident—saying a short sentence about what they enjoyed. This supports emotional literacy and metacognition in line with social-emotional learning literature (CASEL, 2013; Immordino-Yang & Damasio, 2007).

From a design research standpoint, this reflection process creates a feedback loop: recurring observations from teachers, parents, and children can inform refinements in tile design, episode pacing, home prompts, and mediation cues. Assessment becomes part of ongoing iteration, consistent with design-based research in education (Barab & Squire, 2004; Brown, 1992).

The didactic plan ultimately demonstrates how the prototype functions as a living pedagogical system. Its tiles, detachable gestures, pen attachments, origami props, bilingual mediation tools, and narrative rhythm converge into a curriculum architecture that respects the realities of Italian primary schooling while opening new possibilities for embodied, emotionally grounded, and ecologically continuous early language learning.

CHAPTER 08

USER JOURNEY & SCENARIOS

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USER JOURNEY & SCENARIOS

The user journey describes how the educational kit unfolds over time, places, and relationships. It traces the lived experience of a child as they first encounter the story tiles in class, embody the narrative through gesture and play, carry a fragment of that world home, and then return with new meanings and artefacts. In doing so, it shows how teachers and parents participate in the system and how continuity gradually becomes a shared practice rather than an abstract goal.

This journey is grounded in ecological theories of learning, which understand development as emerging from children's participation in multiple overlapping microsystems (Bronfenbrenner, 1979; Rogoff, 2003). It also draws on design ethnography (Suchman, 1987; Dourish, 2001), embodied cognition (Barsalou, 2008; Glenberg & Gallese, 2012), narrative learning (Bruner, 1996), and affective engagement (Immordino-Yang & Damasio, 2007). The scenarios that follow do not describe idealised usage, but realistic patterns of interaction that make these theoretical principles tangible.

8.1 Overview of the Journey

The journey is organised into weekly narrative episodes. Each episode forms a loop that passes through classroom and home, supported throughout by adults who mediate experience in non-evaluative, emotionally safe ways. Story tiles and detachable gesture pieces act as the material anchors of this loop.

Across a typical week, the child moves through a recurring sequence:

- Discovery in the classroom, where new tiles and gestures are introduced within a story fragment.
- Embodied enactment, where the episode is performed using tiles, silhouettes, stencils, and shadows.
- Creative expansion, where children add drawings, origami props, or personal variations.
- Home continuity, where a small material fragment and a bilingual prompt travel home.
- Return and reconnection, where the home experience is recognised and woven into the next classroom session.

This cyclical structure supports "repetition with variation" (Wells, 2009): key words and gestures reappear, but each time in slightly new narrative configurations. Over time, the ritual itself becomes familiar, giving English a stable rhythm in the child's life.

8.2 Scenario 1 — Classroom: First Contact with the Kit

Setting: Tuesday morning, English lesson. Participants: teacher, 18 children aged 6–8, the kit.

The teacher opens the box and selects three tiles: Pinocchio, apple, and look. Each tile is a small square (5–7 cm), with a clear icon and a detachable silhouette. The tiles are placed where everyone can see them. The teacher does not begin with a vocabulary list, but with a story fragment:

"Pinocchio wakes up… he looks around… he sees an apple."

The story is short, concrete, and performable. A child is invited to detach the apple silhouette—a thin, safe outline with a small hole at the base—and slide it onto their pencil. The pencil becomes a tiny puppet handle. The teacher models a line, using gesture and prosody:

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"LOOK! An APPLE!"

The children echo the phrase and the gesture. Another child picks up the Pinocchio silhouette and moves it across the table. When the teacher angles a lamp or points towards a wall, the silhouettes become shadows. The scene shifts into a small theatre.

A child who is usually reluctant to speak is asked only to "help Pinocchio look." She raises the puppet and follows the gesture, joining the activity without needing to produce a full sentence. The narrative, puppet, and shadow mediate expression, lowering the emotional stakes (MacIntyre & Gardner, 1994; Immordino-Yang & Damasio, 2007).

In this first contact, several design principles are already active: language is embodied through gesture and object manipulation; narrative provides a familiar anchor; emotional safety is supported by indirect expression; and the detachable pieces are clearly ready to travel beyond the classroom.

8.3 Scenario 2 — Classroom: Story Enactment and Embodied Learning

Setting: later in the same lesson. New tiles introduced: run, stick, friend.

The teacher gradually adds three more tiles to avoid overwhelming the children's working memory (Sweller, 1988). The class builds a simple scene together:

Pinocchio runs. He meets a friend. He finds a stick.

Each verb tile includes an associated gesture silhouette—running legs, an arm in motion, a pointing hand—designed to invite enactment. Children attach these silhouettes to their pencils and rehearse the episode physically:

Teacher: "Pinocchio RUNS!"
Children: moving their pencil puppets quickly across their desks, repeating: "RUN! RUN!"

Some children use the stick tile as a stencil to draw the object on their paper; others trace Pinocchio's silhouette. In a brief shadow sequence, a pair of children stage a "chase" on the wall, accompanied by short English phrases guided by the teacher.

The same small set of words is now experienced visually, verbally, gesturally, narratively, and socially. This multimodal overlap reflects research showing that early second-language learning is strengthened when multiple sensory channels and modes of representation converge on the same content (Shams & Seitz, 2008; Paivio, 1986).

8.4 Scenario 3 — Home: Continuity and Family Participation

Setting: same afternoon, at home. Participants: child and parent or caregiver.

In a simple folder or envelope, the child carries home:

- the detachable apple silhouette,
- a short bilingual prompt:

"Can you show your grown-up what Pinocchio saw?"
"Puoi mostrare al tuo adulto che cosa ha visto Pinocchio?"

At home, the child places the silhouette on a pencil or holds it by hand, switches on a desk lamp, and creates a shadow on the wall or table.

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Parent: "What is it?"
Child: "Apple!" — said with pride and without pressure.

The parent does not need to know English in order to participate: the explanation is written in Italian and English, and the child is the one who "knows" the answer. The power dynamic shifts: the child becomes the expert and story carrier, which strengthens narrative identity and motivation (Bruner, 1996).

If time and energy allow, the family may fold a simple origami basket using the pattern provided. The apple silhouette is placed inside it. The entire interaction lasts only a few minutes, designed to be light, feasible, and enjoyable across diverse home conditions (Sénéchal & LeFevre, 2002; OECD, 2019).

Continuity here is achieved not through formal homework, but through the travel of a small artefact, a shared gesture, and a story moment that now belongs to both school and home.

8.5 Scenario 4 — Classroom: Return and Integration

Setting: next morning, English class.

The teacher begins by asking:

"Who did something with Pinocchio at home?"

Several children raise their hands. One brings the apple silhouette and the paper basket forward. Others may simply show how they made the shadow or share a drawing they created.

The teacher acknowledges these contributions and weaves them into the new episode:

"Pinocchio found a basket! Who helped him?"
The child points to themselves. The class recognises this as part of the story.

The home action is thus not peripheral but canonised inside the shared narrative. The child's participation is publicly valued, and English is linked to a moment of pride rather than evaluation. In ecological terms, the story has travelled with the child and returned altered, confirming that learning is distributed across settings (Rogoff, 2003; Hutchins, 1995).

8.6 Scenario 5 — Creative Expansion and Child Agency

As the cycle continues, children begin to use the system generatively. During a later episode, they may:

- draw a new character using the available stencils,
- invent an additional object (for instance, a ball or a pet) and attach English words where possible,
- propose alternate story orders ("First Pinocchio hides, then he runs"),
- stage a short shadow performance mixing Italian and English.

The didactic plan explicitly reserves time for these unscripted expansions. Children are allowed to experiment with tile combinations such as:

Pinocchio	+	apple	+	run
Pinocchio	+	friend	+	give
Pinocchio	+	stick	+	look
Pinocchio	+	basket	+	hide

The kit functions as a narrative engine: by combining a small set of characters, objects, and actions, children generate many micro-scenarios. This constructionist use of materials supports deeper understanding and a sense of authorship (Papert, 1980; Resnick & Rosenbaum, 2013).

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8.7 Emotional and Cognitive Trajectory Across the Journey

Over consecutive episodes, the child's trajectory is designed to evolve along several intertwined dimensions:

- Confidence grows as English becomes associated with play, collaboration, and indirect performance, rather than with public correction.
- Embodied retention increases as repeated gestures and object manipulations become linked to specific words and story segments.
- Creative agency develops as children are invited to propose variations, invent new moments, or introduce their own experiences into the story frame.
- Linguistic progression emerges as vocabulary moves from single words to small chunks and simple exchanges, always anchored in narrative context.
- Relational bonds between teachers, parents, and children are strengthened through shared rituals and recognition of home-made contributions.
- Cultural anchoring is reinforced as familiar Italian story worlds become the stage on which English is explored.

These changes reflect research showing that children learn more effectively when narratives provide emotional continuity, when gestures scaffold thinking, and when social contexts are supportive and predictable (Bruner, 1996; Nicolopoulou, 2014; Immordino-Yang & Damasio, 2007).

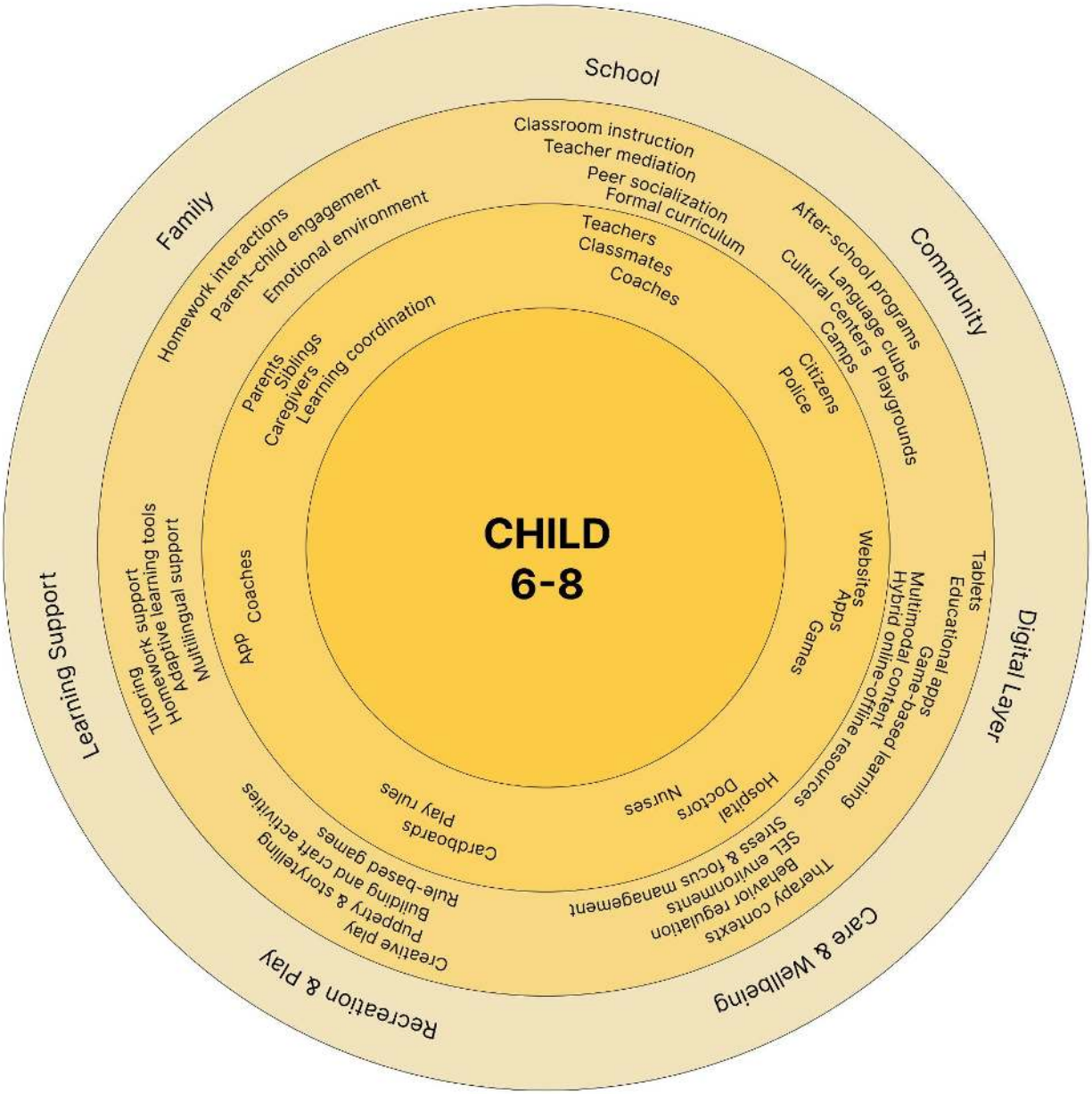
8.8 User Journey Summary

Across the repeated loop of school → home → school, the user journey creates a consistent pattern of:

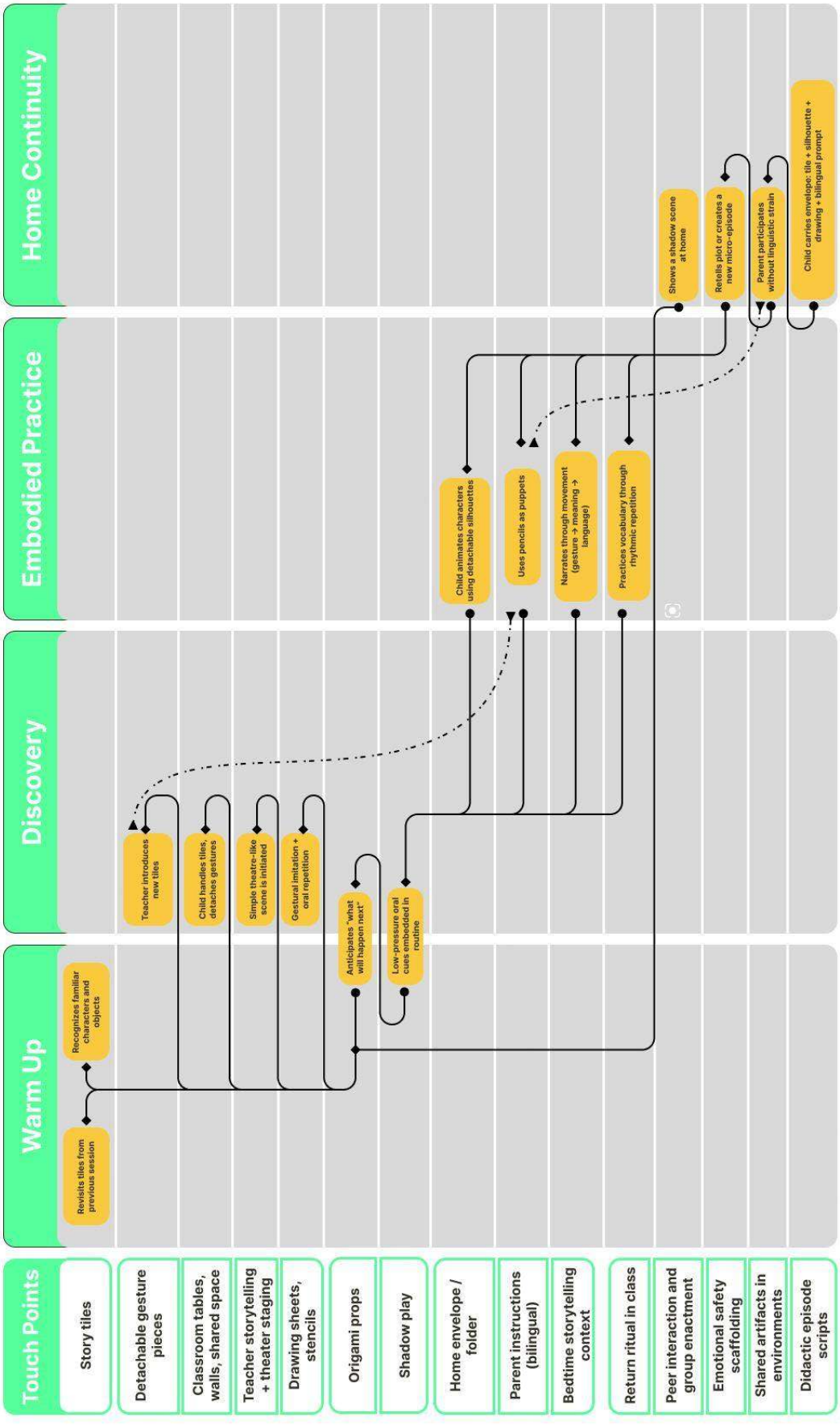
- engagement in a shared story,
- embodied enactment through tiles, silhouettes, and shadows,
- expression through speech, gesture, and drawing,
- exploration of variations,
- reconnection of experiences across environments.

Every element of the kit—tiles, detachable silhouettes, origami props, stencils, shadow play, bilingual prompts—contributes to this ecology. The journey is not an abstract UX diagram but a concrete, relational landscape in which children, adults, and materials co-create a continuous, embodied, and emotionally grounded experience of early English learning.

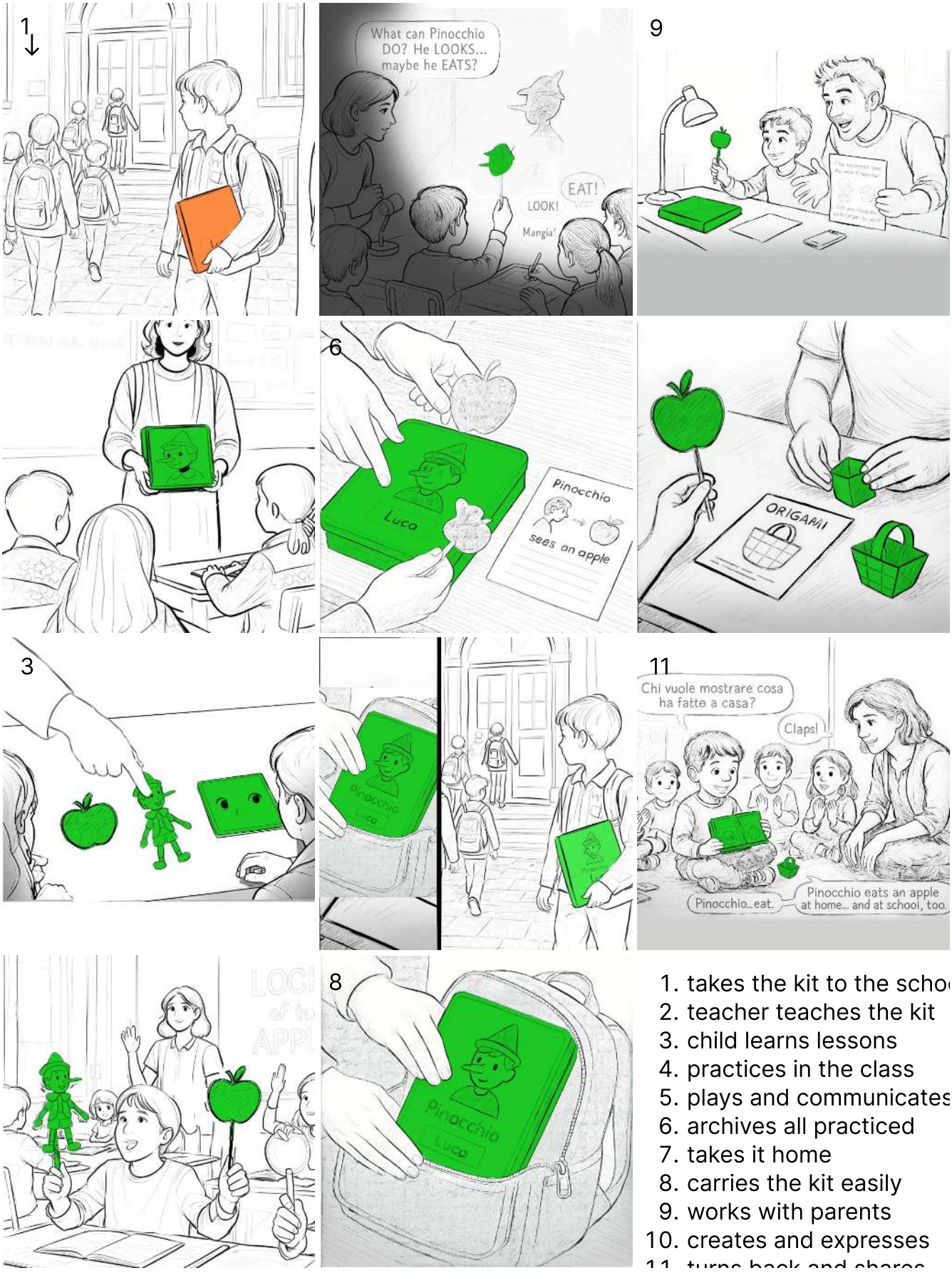
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1. takes the kit to the scho
2. teacher teaches the kit
3. child learns lessons
4. practices in the class
5. plays and communicates
6. archives all practiced
7. takes it home
8. carries the kit easily
9. works with parents
10. creates and expresses
11. turns back and shares

CHAPTER 09

PROTOTYPING PROCESS & TESTING STRATEGY

09. PROTOTYPING PROCESS & TESTING STRATEGY

The final design proposal—a modular, narrative-based educational kit combining detachable story tiles, embodied gesture pieces, stencil and shadow functions, origami props, and bilingual guidance—must be prototyped and evaluated within real learning ecologies. Prototyping is understood here not merely as a technical phase but as a critical investigative moment, where assumptions embedded in the design confront the lived realities of children, teachers, and families. Instead of treating prototyping as the mechanical construction of artefacts, it becomes a reflective inquiry into usability, emotional safety, meaning-making, and continuity across environments.

This chapter articulates a strategy for prototyping and evaluation that balances methodological rigor, ethical care, and pedagogical insight. It does not anticipate empirical findings but defines how the prototype should be observed, interpreted, and iteratively refined. The strategy is anchored in design research (Sanders & Stappers, 2008; Hanington & Martin, 2012), early childhood learning theory (Bronfenbrenner, 1979; Rogoff, 2003; Bruner, 1996), second-language pedagogy (Lightbown & Spada, 2013; Cameron, 2001), and embodied cognition (Barsalou, 2008; Glenberg & Gallese, 2012). Its goal is to respect the child's lived experience, rather than forcing the prototype into rigid technical evaluation frameworks.

9.1 Aims of Prototyping

Three interrelated aims guide prototyping:

First, usability and comprehensibility: Do children intuitively understand how to manipulate tiles, detach gesture silhouettes, mount them onto pencils, use them as stencils or shadow puppets, and combine them to enact a narrative? This addresses fundamental principles of intuitive interaction and universal usability (Norman, 2013; Nielsen, 1994). The goal is not to teach children how to use the system, but to confirm that they can explore it independently and meaningfully.

Second, emotional and motivational response: Does the kit reduce the anxiety commonly associated with early second-language performance? Can indirect expression through characters and puppetry make shy children more willing to participate? Language learning at this age is deeply emotional, and emotional safety is therefore a central performance criterion (Krashen, 1982; MacIntyre & Gardner, 1994; Immordino-Yang & Damasio, 2007).

Third, ecological continuity: Do detachable silhouettes, drawings, origami props, and bilingual prompts naturally travel between home and school? Can families engage with short, flexible activities that reinforce episodic storytelling without becoming evaluative or burdensome? Continuity is not measured by homework completion but by the emergence of shared rituals across environments (Bronfenbrenner, 1979; Barron, 2006).

The prototyping process therefore focuses on relational traction rather than isolated product testing.

9.2 Prototyping Levels and Fidelity

Because the prototype grows from tactile interaction, narrative coherence, and embodied play, multiple fidelities are required to explore different dimensions of the system.

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Low-Fidelity (Exploratory)

At the earliest stage, tiles are printed on ordinary paper, roughly cut silhouettes stand in for detachable pieces, and origami models are minimally sketched. The aim is conceptual clarity: Do children understand how story fragments map onto gestures, stencils, and animated scenes? Can they combine tiles without instruction? Low fidelity encourages improvisation, which reveals early usability constraints and opportunities for embodied experimentation.

Mid-Fidelity (Functional)

As observations mature, tiles are printed with clearer iconography, detachable silhouettes acquire real ergonomic thickness, and the bilingual booklet adopts a more stable layout. These materials allow more realistic classroom dynamics to surface: durability, noise level, ease of passing tiles between children, and clarity of visual grammar during collective enactment. Teachers begin using simplified episode scripts, revealing how pacing, attention, and emotional tone unfold in real time.

High-Fidelity (Pilot-Ready)

In the final prototyping phase, materials approximate the expected production format: tiles are soft, safe, and legible; silhouettes maintain a thickness that maximises shadow quality without adding weight; and the bilingual guidebook contains one complete narrative cycle with structured episodes. This level supports multi-week pilots that allow children to carry artefacts home, narrate with families, and return with new contributions. It becomes possible to track linguistic emergence, continuity behaviour, and emotional confidence across time.

Across all fidelity levels, iterative reflection is central. The design must evolve through cycles of observation, sense-making, and adaptation, consistent with design-based research traditions (Brown, 1992; Collins, 1992; Barab & Squire, 2004).

9.3 Classroom Prototyping Sessions

The classroom is the primary environment where English is formally encountered, where story episodes emerge collectively, and where embodied enactment is most visible. In prototyping sessions, the teacher introduces a small group of tiles—for example, Pinocchio, apple, and look—and presents a short narrative fragment. Children explore the tiles freely before any structured prompt is given, revealing spontaneous manipulation patterns and emerging gestural uses.

Once children grasp the iconography and detachable pieces, the teacher reads the episode from the bilingual guidebook. Children enact scenes using silhouettes mounted on pencils, create small shadow performances, use tiles as stencils for drawing, or invent side moments within the same frame.

Observation focuses on:

- whether children understand the story without textual decoding,
- whether gestures are intuitive rather than forced,
- how shy children respond when performance is mediated through characters,
- whether tiles are durable and safe under collective use,
- whether group configurations support equitable participation.

Teachers discuss what parts prompted creativity, which tiles confused children, which gestures were difficult to reproduce, and how linguistic recall was influenced by embodied action.

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Children may express delight, frustration, boredom, or curiosity —each a meaningful indicator for refinement.

Prototyping in class must honour children's agency. Rather than measuring correctness, sessions observe expressivity, multimodal meaning-making, and emotional climate (Druin, 2002; Guha et al., 2013).

9.4 Home-Based Continuity Tests

Because continuity is structurally central, prototyping must verify whether ecological alignment emerges naturally.

At the end of a session, a single detachable silhouette, drawing, stencil-based object, or origami prop travels home inside a small envelope. A bilingual prompt, written in Italian and English, invites a short shared moment:

"Show your grown-up what Pinocchio saw,"
"Puoi mostrare a casa cosa ha visto Pinocchio?"

The home interaction must be flexible, low-pressure, and relational; families decide when and how to use it. Parents do not need to instruct the child in English: they simply share attention and curiosity. The child takes the lead, demonstrating gestures, recalling events, or improvising new episodes. Some may introduce additional toys or household objects, revealing how the story becomes situated inside domestic imagination.

Evidence of continuity includes:

- a child performing a brief shadow show using a lamp,
- a drawing created from the stencil,
- a new prop imagined at home,
- a parent reporting increased spontaneous English words,
- emotional excitement attached to the continuity ritual.

On the next school day, children bring back the artefact or retell the moment. The teacher acknowledges home participation, integrating its meaning into the evolving episode. The child's narrative becomes part of collective memory. Continuity here is not homework but ecological exchange.

9.5 Teacher and Parent Feedback

Teachers and parents are central interpretive partners. Their feedback reveals usability, emotional tone, logistical feasibility, clarity of scripts, and perceived value.

Teacher feedback is collected through informal conversations, short reflection notes, or semi-structured interviews after episodes. Teachers comment on ease of integration into existing lesson plans, clarity of bilingual scaffolds, classroom management issues, pacing, and signs of increased confidence among shy children. They also reveal how the prototype aligns with curricular expectations and whether it meaningfully complements existing ESL methods.

Parent feedback is intentionally lightweight. Brief bilingual questionnaires or informal notes capture emotional responses, perceived engagement, and moments where English entered family routines. Parents may describe whether the child initiated play independently, the duration of activities, or any frustrations with fine motor manipulation.

Together, these perspectives reinforce the ecological validity of the prototype and deepen understanding of how materials, relationships, and emotional climates interact (Edwards & Mackenzie, 2018).

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9.6 Evaluation Methods and Indicators

The evaluation strategy is qualitative, interpretative, and formative. It prioritises meaning, not measurement.

Indicators of successful interaction include:

- intuitive manipulation of tiles and silhouettes,
- natural gestural enactment during verbs and dialogues,
- collective engagement and laughter,
- visible participation from previously reluctant children,
- emergent English utterances linked to embodied play,
- translanguaging moments where children weave Italian and English fluidly,
- recall of key nouns or verbs after days or weeks,
- artefacts consistently travelling home and back,
- reports of shared storytelling in domestic routines,
- equal engagement across differing levels of linguistic confidence or motor ability.

These indicators derive from young-learner ESL research and multimodal learning frameworks (Cameron, 2001; Lightbown & Spada, 2013). Rather than assessing correctness, the focus is on confidence, continuity, emotional safety, linguistic emergence, and creative agency.

9.7 Iteration and Refinement

After each prototyping cycle, structured reflection informs refinement. Tiles with confusing iconography may be redrawn; silhouettes may require different thickness for better shadow projection; detachable joints may need strengthening; stencils may need simpler curves; prompt sheets may require clearer bilingual phrasing; episode pacing may need adjustment for attention span.

Iteration is not cosmetic. It re-aligns material form with embodied learning, emotional tone, and ecological continuity. The design must remain porous and open to revision whenever lived usage reveals friction, confusion, or new potential.

Iteration also recognises diversity: children with fine motor challenges may prefer larger silhouettes; some families may rely more on drawing than shadow play; some teachers may require slower pacing or smaller tile sets per session. Each variation becomes data for adaptive refinement.

9.8 Future Validation Pathway

Once a high-fidelity prototype stabilises, a short multi-week pilot can evaluate sustained engagement, emotional climate, linguistic emergence, and ecological continuity at scale. The pilot would examine:

- confidence trajectories among shy children,
- narrative complexity as episodes progress,
- durability of materials under repeated handling,
- frequency and quality of home participation,
- interpretability of bilingual guidance by parents,
- teacher satisfaction and curricular alignment.

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Future development may expand into additional Italian story worlds, enabling a library of continuity-based narratives usable across semesters. Extensions could support other language pairs or incorporate gentle digital augmentation that enhances shadow play without replacing embodied interaction. The core principle remains: learning must stay materially grounded, emotionally safe, culturally meaningful, and ecologically continuous.

The prototyping strategy thus becomes part of the design's ontology. Rather than testing a finished product, it reveals the conditions under which the educational kit becomes a living system—negotiated by children, adults, spaces, and stories, and sustained by shared rituals of embodied, bilingual storytelling.

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CHAPTER 10

FUTURE DEVELOPMENT & SCALABILITY

10. FUTURE DEVELOPMENT & SCALABILITY

The educational kit presented in this thesis was conceived as a complete product–service intervention, yet its design logic naturally extends beyond the current configuration. The prototype embodies a coherent set of principles—embodiment, narrative anchoring, emotional safety, and ecological continuity—that do not exhaust themselves within the boundaries of a single story or a single application. Future development is therefore not a matter of adding features, expanding technology, or increasing complexity, but of cultivating the same internal logic across new contexts, age levels, and cultural configurations. Scalability here means strengthening the ecological reach and experiential depth of the system while remaining faithful to the child-centered, low-tech, and relational foundations that motivated the project.

10.1 Expanding the Narrative Universe

At present, the prototype focuses on Pinocchio, chosen for its recognisable cultural texture and its compatibility with episodic storytelling. However, the system's mechanics—narrative tiles, detachable gesture pieces, episodic enactment, and shadow or drawing extensions—can easily inhabit different narrative worlds. Italian folklore contains numerous story environments with equally rich emotional atmospheres and recurring symbolic structures: The Little Donkey, The Befana, or regional folk tales where animals, crafts, and everyday gestures are central.

Future tile sets could explore these universes without redesigning the underlying mechanics. Each story becomes a new linguistic terrain: a different emotional cadence, a fresh set of embodied actions, and new relational scenes that stimulate curiosity and imagination. In this way, children encounter English not as a closed canonical corpus, but as a living resource that travels across cultural memories and personal stories. The expansion remains consistent with developmental research showing that children build meaning more deeply when narrative familiarity coexists with creative reinterpretation (Bruner, 1996; Nicolopoulou, 2014).

10.2 Progressive Language Levels

The prototype is intentionally positioned at Pre-A1 and A1 levels, where concrete verbs, manipulable objects, and short story fragments provide optimal scaffolding for emergent English expression. Yet the physical interaction model naturally accommodates progression. New tile sets could introduce:

- relational verbs (help, share, follow),
- early descriptive structures (big, small, happy),
- simple temporal shifts (yesterday, later, next),
- collaborative micro-dialogues embedded in episodic scenes.

As children increase their linguistic confidence, episodes can grow in narrative depth while still remaining anchored to embodied and visual enactment. Gesture silhouettes can represent more complex actions or interactions; origami props can introduce new environments; and story pacing can evolve without disrupting accessibility. This gradual layering respects children's developmental timing while offering a pathway toward sustained second-language growth (Lightbown & Spada, 2013; Cameron, 2001).

10.3 Cross-Cultural and Multilingual Adaptation

The embodied narrative method is not restricted to Italian children learning English.

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Its architecture can be translated into different linguistic pairs (English–Italian, Italian–Arabic, English–Farsi, English–Spanish), multilingual classrooms, or intercultural communities where stories act as shared identity spaces. By redesigning tiles and bilingual booklets, teachers and parents could use the same learning ecology to support diverse linguistic needs.

This direction is particularly relevant to inclusive or migratory educational settings where children navigate multiple languages daily. Narratives, gestures, and manipulable objects provide a shared symbolic language even when spoken repertoires differ. Such cross-cultural scalability aligns with sociocultural views of learning as participation in community-based practices rather than isolated performance (Rogoff, 2003; Moll et al., 1992).

10.4 Inclusive, Sensory, and Therapeutic Applications

Throughout the research, teachers and families consistently noted children who experienced speech hesitancy, attentional challenges, emotional sensitivity, or social inhibition. The kit already demonstrates natural compatibility with inclusive pedagogies: embodied enactment allows participation without speech; drawing and shadow play support meaning-making without evaluation; detachable silhouettes create emotional distance between child and performance.

Future refinements could intentionally target therapeutic or special education contexts by adjusting:

- ergonomic characteristics of tiles,
- tactile softness and material texture,
- calmer visual palettes for sensory regulation,
- episodic structures that foreground emotional literacy,
- gestures and narratives tied to everyday routines like sharing, waiting, or calming.

The multimodal expressiveness of narrative and embodied play aligns with emerging inclusive education literature, which encourages low-pressure, relational meaning-making rather than accuracy-driven performance (UNICEF, 2021; Edwards & Mackenzie, 2018). In this sense, the kit becomes not only a language tool but a gentle medium of confidence-building, communication, and self-expression.

10.5 Digital Augmentation Without Screen Dependency

While the current prototype avoids digital infrastructures to protect embodied interaction and emotional safety, selective augmentation can enhance continuity, documentation, or pronunciation support. Short audio prompts, accessible via QR codes embedded in the booklet, could provide model pronunciation for teachers or families without requiring children to hold devices or shift their attention away from physical play.

A small online repository could offer additional printable tiles, replacement silhouettes, or story expansions. Teachers might upload reflective notes or home artefacts to create a living library of narrative adaptations. These digital affordances would remain subordinate to physical interaction, reinforcing continuity rather than replacing it. They are not conceived as gamified overlays or screen-based episodes; they simply extend access, sustainability, and fidelity when helpful.

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10.6 Sustainable Manufacturing and Local Production

As the prototype matures toward production, material refinement becomes both practical and ethical. Lightweight recycled laminates, biodegradable composites, or laser-cut recycled cardboard would maintain durability, softness, and child safety while reinforcing environmental responsibility. Because the kit is flat, modular, and light, it lends itself to low-waste processes such as die-cutting, flat-pack distribution, or community-based fabrication through fab labs or school makerspaces.

These pathways are not design afterthoughts—they express the project's foundational commitments to accessibility, affordability, safety, and equitable adoption. Schools could reproduce tiles locally, replace damaged pieces, or fabricate new silhouettes without dependence on proprietary manufacturing, increasing sustainability and ownership.

10.7 Teacher Development and Professional Practice

Although tiles and detachable silhouettes are intuitive for children, teachers may welcome additional professional support as the system scales. Short video walkthroughs, annotated scripts, modular lesson plans, and reflective documentation tools would support confident facilitation, deeper pedagogical understanding, and alignment with curriculum expectations. These resources would strengthen continuity not only between environments (home/school) but also between episodes and academic planning cycles.

Teacher agency remains central: the system is a pedagogical scaffold, not a scripted curriculum. Documentation tools could help teachers track affective shifts, emergent vocabulary, or multimodal participation without imposing assessment pressure. Using reflective materials, teachers might co-interpret children's drawings, shadow scenes, and gesture improvisations as evidence of meaning-making and emotional comfort.

10.8 Longitudinal Pilots and Research Contribution

To fully understand the ecological and emotional potential of the kit, future work should include multi-week pilots in diverse schools and family settings. Longitudinal observation would allow evaluation of:

- emerging gesture–speech coupling,
- sustained participation from shy or hesitant children,
- evolving narrative complexity,
- stability of continuity rituals over time,
- parental confidence in bilingual mediation,
- classroom climate and peer collaboration.

Such pilots would contribute not only to product validation but to academic discourse on embodied language pedagogy, early bilingual experience, and continuity-centered learning. Findings could inform teacher training, ESL resource design, and inclusion policies in early education.

10.9 Scalable Pathways and Systemic Potential

As the kit progresses, it may evolve into a wider ecosystem of story packs, language packs, theatrical extensions, community storytelling festivals, and cross-school collaborations.

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Each extension should remain faithful to core principles rather than seeking novelty: embodied meaning-making, narrative anchoring, emotional safety, and ecological continuity. The intention is not to accelerate content volume but to deepen everyday rituals of bilingual storytelling, strengthen identity work, and reinforce shared agency between children, adults, and environments.

At scale, the system could become part of school culture—used not as a one-off instructional aid but as a relational practice: classrooms making stories, families extending them, children animating them, teachers reflecting on them, and communities celebrating them. The kit would therefore cultivate a living ecology where language becomes not a subject to be memorised, but a material and emotional world children inhabit together across time and space.

CHAPTER 11

CONCLUSION

11. CONCLUSION

The work presented in this thesis set out to address a subtle yet systemic challenge in early language education: how to create meaningful, emotionally safe, and pedagogically coherent opportunities for Italian children aged six to eight to encounter English across the two microsystems that structure daily life—home and school. From the start, empirical observations confirmed that these environments rarely reinforce each other. Learning trajectories are repeatedly disrupted as children move between settings with different expectations, different materials, and different emotional climates. What children learn in class often fails to travel into their lived routines at home; what children experience at home rarely re-enters the classroom. As a result, early English learning becomes fragmented rather than cumulative, driven more by circumstance than continuity.

Conventional ESL practices tend to intensify this fragmentation. Many programs rely on static visuals, periodic listening tasks, or abstract repetition disconnected from embodied interaction. Performance pressure—intentional or not—can heighten anxiety for young learners who are still developing emotional regulation and narrative identity. Yet a large body of interdisciplinary research makes a different argument: children build linguistic and conceptual meaning through gesture, shared attention, story-based interaction, emotional safety, and multisensory experience. Learning becomes durable and memorable when it is lived in context rather than memorised in isolation.

The educational kit designed in this thesis responds directly to this structural problem by proposing a material and pedagogical artefact that reconnects fragmented ecologies. By combining narrative structure, embodied interaction, tactile affordances, cultural familiarity, and bilingual mediation, the kit creates a learning environment where English is not introduced as a subject to be mastered but as a lived medium for play, action, and shared meaning-making. The tile system, detachable gesture silhouettes, stencil and shadow applications, origami extensions, and bilingual guidebook all function as interoperable elements of a holistic experiential system. Together, they allow children to touch, manipulate, perform, and reinterpret story elements while moving fluidly between school-based and home-based participation. Teachers can integrate episodic storytelling without abandoning their existing didactic structure; parents can engage without needing linguistic expertise; and children can explore meaning through action, rhythm, character, and collaborative experimentation.

Narrative is not simply a pedagogical technique within this system—it is a cognitive and emotional architecture through which young children understand themselves, organise temporal experience, and co-construct meaning with others. Rooting the prototype in a familiar cultural story such as Pinocchio allows English learning to emerge inside a trusted emotional frame rather than as an abstract task divorced from children's lived identities. Familiar characters and recognisable situations reduce cognitive load and emotional exposure, while embodied novelty—gestures, shadows, props, scene-building—opens space for improvisation, reinterpretation, and playful risk-taking. Children can narrate, invent, and experiment with English inside a narrative world they already know, which protects emotional safety while encouraging expressive confidence.

The affective and social implications of this design are particularly significant. Throughout prototyping, children who were hesitant to speak or who typically avoided language tasks participated more readily when expression was mediated through puppetry, gesture, drawing, or shadow play. The use of indirect expression allows mistakes to become part of narrative experimentation rather than personal vulnerability.

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Objects become emotional mediators: a silhouette on a pencil can "try" a phrase or exaggerate a feeling in ways a child might resist doing directly. Embodied play grounds attention, supports emotional regulation, and transforms language into collaborative experience rather than evaluative performance. These shifts reflect research showing that willingness to communicate in a second language emerges from a secure affective climate and meaningful participation rather than correction or drilling.

Equally important is the kit's capacity to enact ecological continuity. Its components are intentionally designed to travel between environments, to retain narrative coherence, and to support relational mediation. A detachable silhouette, a drawing made with a stencil, or a small origami prop becomes not merely homework but a narrative export—a fragment of meaning that enters the home environment as a prompt for play, shared attention, or conversation. The child becomes a narrator and a guide, re-enacting a classroom story with a parent, sibling, or caregiver in a low-pressure, relational atmosphere. The next day, these home-based contributions re-enter the classroom and become part of the shared episode, creating reciprocal movement between environments. Continuity is therefore not an administrative alignment but a narrative ritual enacted through small material gestures and shared storytelling.

The methodological process that shaped the design underscores how interdisciplinary inquiry is essential for pedagogical innovation. The insights of embodied cognition (Barsalou, 2008; Glenberg & Gallese, 2012) informed the material logic of gesture, manipulation, and shadow play. Developmental and narrative psychology (Bruner, 1996; Nicolopoulou, 2014) framed the emotional and symbolic dimensions of storytelling. Affective and socio-emotional research (Immordino-Yang & Damasio, 2007; MacIntyre & Gardner, 1994) guided the reduction of performance anxiety and the foregrounding of indirect expression. Ecological theories of learning (Bronfenbrenner, 1979; Rogoff, 2003) made continuity a design requirement rather than an optional extension. Multisensory learning (Shams & Seitz, 2008) justified multimodality as a cognitive engine rather than a creative surplus. Each design decision—from tile dimensions to bilingual prompts—was therefore traceable to research evidence, user observation, and iterative prototyping.

The prototype does not claim to resolve all structural limitations of early ESL education. However, it demonstrates a viable alternative to prevailing approaches by showing how meaning-making emerges when the emotional, embodied, and ecological realities of childhood are foregrounded rather than treated as peripheral. Language becomes memorable when it is performed, co-narrated, and physically experienced; confidence emerges when children express meaning through characters, shadows, gestures, props, and scenes rather than through evaluative performance; continuity develops when artefacts, routines, and shared stories move between environments. The prototype is therefore not only a material artefact but a pedagogical stance: continuity over fragmentation, play over abstraction, narrative over isolated vocabulary, embodiment over rote memorisation, emotional safety over correctness.

As the project moves into future development, the same design logic provides a clear foundation for expansion. Additional story worlds, multilingual adaptations, inclusive refinements, and longitudinal pilots can deepen the cultural, emotional, and pedagogical reach of the system without altering its core commitment to embodied storytelling and ecological continuity.

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The promise of the kit lies not in its novelty as an object but in its ability to reshape everyday learning ecologies through small, repeatable, relational acts: a silhouette moving across a desk, a child narrating a gesture, a drawing returning to school, a bedtime puppet scene, a shared laugh, an improvised idea.

The conclusion of this thesis is therefore not a closure but an opening. It invites continued exploration into how design can honor children's ways of thinking, communicating, imagining, and belonging across the spaces they inhabit. When learning materials function as emotional mediators, narrative companions, and ecological bridges—not as instructional demands—language becomes a lived experience that supports curiosity, identity, relationship, and expression. The design presented here is one prototype within that broader vision, but it illustrates a central possibility: that when early language learning is grounded in embodied action, emotional safety, cultural familiarity, and relational continuity, English becomes not an academic burden but a shared story world children can inhabit with confidence and joy.

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