Evolving Play:

Designing Healthy Digital Game Environments for Childhood

By: Beyza Ozmen

Submitted to OCAD University in partial fulfillment of the requirements for the degree of Master of Design in Strategic Foresight and Innovation (SFI)

Toronto, Ontario, Canada, 2025

Copyright Notice

Abstract

Play is a fundamental right of childhood and a critical driver of cognitive, social and emotional development. Yet, in increasingly digitized environments, the qualities that make play open-ended, imaginative and child-led are often constrained by platform architectures, monetization models and regulatory gaps. This research investigates how digital game environments for children are shaped, where their potential to support healthy development is nurtured or diminished and how they might be redesigned to better align with the principles of meaningful play. Adopting a systems-oriented design methodology, the study integrates a literature review of classical and contemporary play theories with systemic mapping tools, actor maps, iceberg models and causal loop diagrams to reveal the structural forces influencing children's digital play. A participatory workshop with adult participants, drawing on memory work and speculative design, was conducted to explore cultural narratives, tensions, and aspirations surrounding digital play. The findings highlight recurring patterns of diminished agency, commercial overreach and fragmented governance, alongside opportunities for creativity, care and shared meaning-making. By synthesizing these insights, the project proposes design principles and policy considerations aimed at reframing digital play environments as spaces that protect children's rights, foster autonomy and sustain the imaginative richness essential to childhood.

Acknowledgements

This project was shaped by the generosity of the *workshop participants* from OCAD University, who shared their memories, mapped tensions, and envisioned futures with sincerity and care. Your thoughts and principles are at the heart of this research. I am grateful to Psychologist with a master's degree in psychology, *Zeynep Yavuz*, who provided consultative guidance on this study's developmental framework.

I would like to express my sincere thanks to my advisor, *Michele Mastroeni*, for his guidance, thoughtful critiques, and incisive questions throughout this journey. I am also thankful to the *OCAD SFI community* and my *professors* for the joy they brought to my learning through multidimensional inquiry, which profoundly shaped the way I think. This was a unique way of playing and learning together; for that, I am deeply grateful to my *classmates*, my *playmates*. It was a privilege to learn with you. I would like to express my sincere thanks to the *professors* and *instructors* who helped me improve my design skills during my undergraduate studies. I am especially grateful to Professors *Ozlem Er* and *Avsar Gurpinar* for their support and advice, which helped me decide to pursue a master's degree.

As ever, my *mother* and *father* deserve more gratitude than I can express. I am deeply thankful for your unwavering support, which has been essential in helping me become who I am. My sister, *Muberra*, you are my most precious playmate. When my games became serious, you turned them into steps I could climb. It was a privilege to feel your support throughout this process. I would like to express my sincere thanks to my best friend and partner, *Kaan*, for standing by me through every challenge and celebration. Your belief in my success and your constant love means everything; I am grateful to have you. To my brother-in-law, *Jai*, thank you for your brotherhood. Your understanding and thoughtful surprises have been a steady source of morale. *Zeynep* and *Suleyman* are the most important members of my extended family; thank you for your kindness, generosity, and unconditional support. I am sincerely grateful to *Ozan*, whose unique spirit has made him both a friend and a brother-in-law. To my dear friends *Ebrar, Irem, Zeynep, Benay, Elif*, and *Cagla*, thank you for your friendship and encouragement. To my nephews *Kerem, Kayra*, and *Vera*, this project is for your future; your bright, innocent childhoods remind me why this work matters. And to *Kido*, my beloved cat, my little child, thank you for your playful energy and unconditional love; I am grateful for you.

Finally, to all the *play* I have shared and all the *playmates* I have had along the way: thank you for shaping who I am today.

Dedication

To all the play I have experienced –

and to my family, who gave me the freedom to explore it.

Table of Contents

List of Figures and Tables

Glossary

Agôn: Competition-based play that centers on skill, rivalry and fair contest.

Alea: Chance-based play where outcomes are determined by luck rather than skill.

Autotelic play: Play undertaken "for its own sake," with intrinsic motivation and enjoyment as the primary reward.

Child-centred agency: A child's ability to initiate activity, make meaningful choices, negotiate or invent rules and shape outcomes within play.

Free play: Child-initiated and child-directed play with minimal adult control or preset goals.

Ilinx: Play that seeks vertigo or sensory disorientation (e.g., spinning, tumbling).

Ludification: The spread of playful logics into non-game contexts; making activities feel game-like without necessarily becoming formal games.

Ludus: Rule-bound, goal-oriented play emphasizing structure, constraint and mastery.

Magic circle: The social/psychological boundary that marks "this is play," within which special rules and meanings apply.

Open-ended play: Play without fixed goals or single correct outcomes; multiple paths and endings are possible.

Paidia: Spontaneous, improvisational play with minimal rules; emphasizes exploration, make-believe, and flexibility.

Structured play: Play organized by predefined rules, tasks, or adult direction, with clear goals and success criteria.

1. Introduction: Rethinking Play in a Digital Age

1.1 Preface

Childhood play has long been recognized as a cornerstone of cognitive, social, and emotional development, offering children a space to imagine, negotiate and explore (Piaget, 1962; Vygotsky, 1978; Bruner, 1983). In its traditional forms, play is fluid, self-directed, and deeply embedded within cultural contexts, shaped by children's interpretations and peer dynamics (Huizinga, 1949; Sutton-Smith, 1997).

In the digital age, however, these qualities are increasingly mediated sometimes even constrained by the structure of platforms and technologies. Digital play environments often operate within systems driven by monetization loops, algorithmic personalization, and policy restrictions (Grimes, 2021; Consalvo, 2009). While these platforms can expand access to creative tools, they may also narrow the scope of play, replacing *open-ended exploration* with *predetermined pathways and reward cycles* (Sicart, 2014; UNICEF, 2022).

In the world and environment, I was born into, the boundaries of play what was encouraged, discouraged, or even prohibited were not as sharply defined as they appear today. My childhood in Turkey was shaped by outdoor, self-invented games with friends, creating our own rules and worlds in gardens and streets. Even moments of screen-based engagement choreographing dances to music channels, performing for our parents or collectively imagining ourselves as characters from animated films were infused with creativity and shared agency.

Today's children, by contrast, are born into a world where digital environments are not only prevalent but are likely to remain central to their lives. This reality raises a complex question: *if digital play is an inevitable part of contemporary childhood, what does it mean to restrict, prohibit or uncritically accept it?* Observing parents in my own community, I have seen varied approaches some restricting digital play entirely, others offering it freely and still others

negotiating daily battles with their children over access. These tensions underscore a broader uncertainty about how digital play should be integrated into healthy developmental contexts.

These reflections are not purely academic. They are rooted in personal experience and in my ongoing observations of how children's opportunities for play are shaped by a mix of cultural traditions, technological infrastructures and adult perceptions. The patterns I see of possibilities both expanded and constrained have led me to this research. My aim is to better *understand how children's digital play environments are structured, where they support or limit agency and how they might be reimagined to restore play as a space for creativity, autonomy and shared meaning*. Ultimately, this work is driven by the hope that future generations will have opportunities to play in ways that are as rich, self-directed and meaningful as those I was fortunate to experience.

1.2 Research Context and Objectives

The landscape of children's play has undergone a profound transformation in the digital age. While traditional play has long been understood as an essential driver of cognitive, social, and emotional development (Piaget, 1962; Vygotsky, 1978; Erikson, 1951), contemporary digital platforms have reshaped where and how children play. Increasingly, children's play is mediated by apps, game platforms and connected virtual worlds, where design choices are informed not only by educational or recreational goals but also by commercial and algorithmic imperatives (Grimes, 2021; Pepall & Reiff, 2017).

Although these spaces appear playful and are marketed as "educational", three dynamics largely shape them. First, engagement is organized around monetization advertising, in-app purchases and attention-capturing features (Radesky et al., 2022; Grimes, 2021; OECD, 2024). Second, adult-centered scripts "schoolify" play and limit children's choices under the banners of learning or safety (Sutton-Smith, 1997; Livingstone & Pothong, 2022; UNICEF Innocenti, 2022). Third, platform governance places the rules of play in software architectures,

algorithms and content policies rather than in children's interactions (Consalvo, 2009; Raessens, 2006; Grimes, 2021).

These shifts have both developmental and ethical implications. Research in developmental psychology emphasizes that play is a primary context for imagination, social learning, and problem-solving, which thrive in open-ended, child-led environments (Bruner, 1983; Piaget, 1962). When digital play replaces intrinsic motivation with external reward loops or when children are excluded from design processes, the cognitive and socio-emotional benefits of play risk being diminished (Flanagan, 2009; Sicart, 2014).

This research focuses on three goals:

- Map the systems that shape children's digital play.
- Understand the differences between traditional and digital play environments.
- Explore ways to redesign digital play that center children's rights, voices, and growth.

The project looks at the problem as both from a systemic and design-based point of view. By combining system mapping, critical play theory and participatory methods, it identifies points where change is possible to restore play as a space for creativity, agency and learning.

1.3 Research Questions

The central objective of this research is to investigate how digital play environments for children can be understood, critiqued and reframed through a systems-oriented, participatory and speculative lens.

Primary Research Question:

This study is guided by a set of interconnected lines of inquiry. It examines how children's digital play environments are currently structured and the visible and invisible forces that shape them. Also, it explores the tensions that arise between traditional notions of play and their contemporary digital forms, with particular attention to issues of agency, ethics and

developmental value. Finally, investigates how these environments might be reimagined to support children's rights, creativity and flourishing in a digital age. Together, these strands lead to the central research question: **How can digital play environments for children be reimagined to restore the qualities of agency, creativity and developmental value that define meaningful play?**

1.4 Scope, Limitations and Contributions

This research focuses on early to middle childhood and examines digital games and platforms rather than broader digital media. It does not involve direct observation of children to avoid ethical complexities, relying instead on secondary research, participatory workshops with adults, and speculative design outputs to surface systemic insights.

Key limitations include:

- Insights are mediated through adult participants and existing research rather than direct child ethnography.
- The project focuses on design implications and systemic understanding rather than producing deployable interventions.
- The rapidly evolving nature of digital platforms means findings represent a snapshot in time rather than a dynamic assessment.

Despite these limitations, the project contributes:

- A multi-layered theoretical synthesis bridging play studies, child development and game design.
- System maps, feedback loops and leverage analyses illuminating the hidden structures of existing digital play.
- Design principles and speculative scenarios that reimagine digital play environments aligned with children's rights and agency.

1.5 Structure of The Report

The report is organized into eight chapters:

- **Introduction** – Establishes the rationale, problem space, objectives and structure of the research.
- **Methodology** – Outlines the systems-oriented, participatory and speculative methods applied.
- **Understanding Play** – Explores key theories and definitions of play, including cultural, structural and developmental perspectives.
- **Systems of Digital Play** – Presents systemic mappings of how digital play is structured, including actor maps, iceberg models and feedback loops.
- **Participatory Insights: Workshop Findings** – Describes the workshop study and synthesizes reflections from workshop participants, highlighting collective visions of digital play.
- **Reimagining Play Possibilities** – Uses Sharpe's Three Horizons framework to frame a developmental arc for digital play Horizon 1 (present constraints), Horizon 2 (transitional signals) and Horizon 3 (child-centered futures) and to connect Section 4's system loops with Section 5's insights.
- **Synthesis & Interventions** – Identifies ethical principles and leverage points; translates H2 signals into near-term experiments and policy levers; and outlines how "safe-by-default" design can relieve constant parental gatekeeping.
- **Reflections** – Concludes with personal insights, limitations and implications for future research and design.

2. Methodology and Approach

2.1 Methodological Positioning Approach:

This research adopts a systems-oriented design methodology, informed by design journeys, which views research as a non-linear process of discovery, meaning-making and systemic intervention (Jones & van Ael, 2022). This approach allows to map and interrogate the underlying structures that shape children's digital play environments while imagining alternative futures.

To support this framework, I also draw on critical play methods, which emphasize play as a site of resistance, creativity and cultural intervention (Flanagan, 2009). Critical play enables the design process to be reflective, value-driven and disruptive, particularly when addressing issues such as surveillance, agency and control in children's digital experiences.

Finally, I adopt a child-centered design approach that positions children not only as users but also as stakeholders whose needs, perspectives, and imaginative potential should guide the design of play systems (Feder, 2020). This reframing allows to center empathy and ethical consideration throughout all phases of research.

A psychologist (M.A./M.Sc. in Psychology) was consulted in an advisory capacity to clarify the importance of play for children and to help anticipate from a child's perspective how responses by surrounding actors in the digital game system (e.g., platforms, parents, regulators) might be felt and interpreted. To incorporate additional perspectives, volunteer adult participants (graduate students) were engaged in a participatory workshop, during which at Step 5, they articulated the design principles later reported. My role was to lead the overall research and analysis and to synthesize participants' discourse.

2.2 Research Methods and Tools

This research combines theoretical grounding, systems thinking, and participatory inquiry to examine how digital game environments affect children and how they can be redesigned.

It begins with a *literature review* focusing on both classical and contemporary game theories:

- Foundational studies such as Huizinga's (1938) "Homo Ludens", Caillois's (1958) typologies of play and Sutton Smith's "Discourses of Play" were examined.
- *More recent perspectives,* such as Sicart (2014), who emphasized the expressive and ethical nature of play and Grimes (2021), who critiqued the regulatory and commercial structures embedded in children's digital platforms, were also included in the study.

System mapping tools were used to analyze the dynamics of digital game play:

- The *actor map* was used to visualize how knowledge and control are distributed among children, parents, developers, platforms and regulators (Jones & van Ael, 2022).
- An *iceberg model* was used to connect surface-level issues (such as gamified learning or ad-driven content) to deeper systemic patterns and mental models (Jones & van Ael, 2022).
- *Causal loop* diagrams were created to trace feedback structures such as monetization loops, security-control loops and the removal of power from children (Jones & van Ael, 2022).
- The *Three Horizons* framework was used to stage findings across Horizon 1 (present constraints), Horizon 2 (transitional signals) and Horizon 3 (child-centered futures), linking analysis to near-term experiments and long-term principles (Jones & van Ael, 2022).
- Using a *leverage point framework*, i*ntervention points* were considered and areas within the system where change could be possible were identified (Jones & van Ael, 2022).

A *participatory workshop* was held with adult participants to elicit lived perspectives on play:

- Participants were guided to recall and share their early play memories.

- The tensions and desires surrounding today's digital childhood were identified.
- Alternative futures were imagined through utopian and dystopian worldbuilding.
- Design principles for healthier play environments were collaboratively developed.
- Qualitative outputs were analyzed to identify recurring themes around care, agency, control, and imagination.

Analytic procedure for participant outputs. I used first-cycle in vivo coding to capture participants' wording from sticky-note clusters and scenario narratives (Steps 1–4), followed by second-cycle pattern coding to group recurring ideas. The principles were articulated by participants in Step 5; I then checked and lightly standardized their wording by comparing them with earlier workshop materials. Recurrence was noted when an idea appeared in more than one material and, where visible, across groups and scenario types. Where evidence was limited, I retained the participant phrasing and treated the finding as indicative.

Using these methods, it is aimed for the project to move beyond superficial critique and reach a layered understanding of play by bridging cultural narratives, platform structures and human experience.

2.3 Ethics and Reflection

This research explores childhood, an ethically sensitive and emotionally complex area. While no children were directly involved, their needs and rights played a central role throughout the process. The focus was not on speaking for children, but on examining how digital play is structured around them, often without their voices being heard.

I used empathy tools throughout the project to stay close to a child's perspective. These helped me step away from my own assumptions and ask questions like, "how would I feel if I were a child?" or "what might a child need right now?" I also consulted with psychologist (M.A./M.Sc. in Psychology) Zeynep Yavuz, whose expertise in child development provided valuable insights and helped me deepen this reflection.

The workshop invited adults to reflect on their own memories of early play not to replace children's perspectives, but to understand how early experiences shape how we think about play today.

Rather than imagining an idealized version of childhood, I focused on identifying the structural forces platform control, monetization pressures and cultural norms, that silently influence how play is presented, constrained or evaluated in digital spaces.

Throughout the project, I was aware of how my own background, gaming memories and design training shaped how I interacted with the system and interpreted what I found.

2.4 Research Design and Timeline

The research followed an iterative and layered process. It began with an in-depth literature review to understand the foundations of play and how it reshapes the meaning and function of digital systems. This phase helped clarify fundamental tensions between traditional gaming values and current digital environments.

Based on these insights, I developed a set of systems tools (actor map, iceberg model and causal loop diagrams) to explore the structures behind digital play. These tools were refined over time, often in response to new ideas or gaps that emerged through reflection.

The workshop was designed and conducted after the systems analysis phase. It allowed participants to engage with the topic through memory work, mapping and speculative design. Their contributions were then analyzed to identify recurring themes and potential intervention points.

Throughout the project, I moved back and forth between theory, systems thinking and creative practice. Rather than following a strictly linear path, the process evolved through continuous reflection, feedback and synthesis.

3. Understanding Play: Key Theories and Definitions

3.1 The Challenge of Defining Play

Understanding play is never a straightforward task. When exploring the conceptual definition of play, one encounters its multidimensional, fluid and context-sensitive nature. This ambiguity is not a shortcoming, but rather a defining feature of play itself. Scholars have long emphasized that attempts to rigidly define play often limit its richness and relevance across disciplines (Sutton-Smith, 1997; Henricks, 2008; Sicart, 2014).

This realization leads to the question of whether the pursuit of a singular, essential definition is either necessary or productive. Instead, what emerges is perspectives shaped by disciplinary lenses and ideological commitments (Caillois, 1958; Salen & Zimmerman, 2003; Sicart, 2014). For instance, Huizinga (1938) positions play as a foundational element of human civilization something that predates culture and helps generate it. Caillois (1958), in contrast, describes play along a continuum from *paidia (free, spontaneous play)* referring to spontaneous and expressive activities, to *ludus (structured play with strict rules)* which involves structured and rule-bound formats. This typology reveals play's inherent heterogeneity and its resistance to fixed categorization (Caillois, 1958; Suits, 1978).

Sociologically, play can also be interpreted as a relational practice. Henricks (2008) emphasizes that play unfolds meaning through the social contexts it inhabits, where rules are not merely restrictions but shared agreements that enable collective meaning-making. This shifts the inquiry away from essentialist definitions toward the experiential and functional dimensions of play how it facilitates interaction, nurtures imagination, and creates shared spaces of possibility (Sutton-Smith, 1997; Ermi & Mäyrä, 2005; Sicart, 2014).

Collectively, these perspectives suggest that ambiguity is not an obstacle to understanding play, but rather a condition of its conceptual vitality. Embracing this flexibility becomes especially relevant when exploring contemporary digital play environments, where the

boundaries of play are increasingly shaped by monetization models, algorithmic regulation and the logics of game design (Aarseth, 1997; Sicart, 2014; Costikyan, 2002; Ryan, Rigby, & Przybylski, 2006; Deterding, Dixon, Khaled, & Nacke, 2011). These systems further complicate traditional notions of play, embedding it within socio-technical structures that demand new interpretive frameworks (Hunicke, LeBlanc, & Zubek, 2004; Fullerton, 2018; Bogost, 2006).

3.2 Foundations of Play: From Culture to Structure

To explore the nature of play, it is helpful to start with Johan Huizinga's influential claim that "play is older than culture", asserting that play is not merely a cultural product but a formative force of culture itself (Huizinga, 1938). This definition feels thought-provoking and reminds that the values of play can vary as widely as the cultures they belong to. His conception of the "magic circle" describes a temporal and spatial frame where play is set apart from ordinary life and governed by its own logic (Huizinga, 1938). Within this frame, rules are not experienced as external constraints but as agreements that generate symbolic meaning and shared coherence (Henricks, 2008; Mäyrä, 2008).

This resonates with the way children engage in traditional games such as hide-and-seek or jump rope activities sustained by voluntary participation and socially constructed rules. As Henricks (2008) notes, these rules are inherently relational, adapting to the context and the players involved. This capacity for adaptive transformation is echoed in Sutton-Smith's (1997) notion of "adaptive variability", which highlights how children reconfigure games to suit shifting environmental and social conditions while maintaining their structural core.

Roger Caillois (1958) adds further dimension to this discussion through his taxonomy of play, which includes *agon* (competition), *alea* (chance), *mimicry* (role-playing, make-believe) and *ilinx* (disruption), all situated along a spectrum from *paidia*, characterized by spontaneity and improvisation, to *ludus*, marked by discipline and structure. Among these, mimicry is particularly relevant to childhood, as it allows children to experiment with roles, stories, and imagined worlds. This form of make-believe directly supports the development of identity,

echoing Sutton-Smith's modern rhetorics of play, where play is not just a collective cultural practice but also a deeply personal space for self-expression and micro-performance (Sutton-Smith, 1997).

The modern rhetorics outlined by Sutton-Smith such as play as imagination, identity, frivolity and self-highlight how play functions as an exercise of freedom and a medium for self-construction. For children, these rhetorics are central: pretending to be a hero, a parent or an explorer is not just entertainment but a way of rehearsing social roles, building self-esteem and experimenting with who they might become (Sutton-Smith, 1997). Through these narratives, play acts as both a personal and cultural bridge, simultaneously preserving traditions and enabling individual transformation.

This perspective aligns closely with Miguel Sicart's (2014) assertion that "play is personal". In Play Matters, Sicart emphasizes that play is a singular, lived experience shaped by the player's context, memories and moral or emotional attachments. Play is not solely about structured games or social performance; it is a way of being in the world, of making sense of objects, relationships and oneself (Sicart, 2014). For children, this personal dimension of play is inseparable from the developmental processes of autonomy and creative exploration.

Applying these foundational ideas to digital play requires careful attention. Although many digital games borrow elements from traditional play, their mechanics are frequently defined by algorithmic rules and platform-specific constraints (Juul, 2005; Deterding et al., 2011). Within this context, Huizinga's voluntary "magic circle" is no longer entirely player-driven; instead, children encounter play shaped by design logics, monetization models and data-driven nudges (Consalvo, 2009; McGonigal, 2011). Consequently, agency within play often shifts toward the system itself, where platform architectures determine the conditions of engagement (Bogost, 2007; Juul, 2001).

These changes present an epistemological tension: when the conditions of play are no longer co-created or negotiated by the players, but instead predetermined by opaque systems, the

foundational freedoms of play begin to erode. This is particularly significant in childhood, where play is closely tied to developmental agency, exploration and identity formation (Sutton-Smith, 1997; Sicart, 2014; Ryan, 2006).

In this project, I use these theoretical models not to treat play as a fixed concept but to trace how its core structures freedom, rules, variability, identity and cultural embeddedness are shifting in digital childhood. Rather than treating digital games as a rupture from traditional play, I view them as hybrid environments where classical patterns are restructured through code, interfaces, and monetization logics (Juul, 2005; Salen & Zimmerman, 2004; Fullerton, 2014; Deterding & Bredow, 2011). Mapping these transformations is essential for understanding what is at stake in designing healthy digital play for children.

3.3 Play in Developmental Psychology

Understanding play through a developmental lens allows us to explore how play supports children's growth across cognitive, emotional, social and moral domains. Developmental psychologists have long emphasized that play is not merely recreational, it is central to how children learn, make sense of the *world* and develop a sense of self (Piaget, 1962; Erikson, 1951; Bruner, 1983). Jean Piaget viewed play as a reflection of evolving cognitive structures, unfolding through stages of sensorimotor, symbolic and rule-based play, each aligned with a child's growing capacity to represent and manipulate reality (Piaget, 1962; Vygotsky, 1978).

In contrast, Lev Vygotsky framed play as a socially and culturally embedded activity shaped by language and interpersonal interaction, where children internalize roles, problem-solving strategies and cultural tools through guided participation and symbolic transformation (Vygotsky, 1962, 1978; Rogoff, 1990; Cole & Scribner, 1978). From this view, play becomes a zone of proximal development, where adult scaffolding and peer interaction collaboratively support children in mastering tasks just beyond their independent ability (Roschelle, 1992; Scardamalia & Bereiter, 1991; Putnam & Borko, 2000).

Erik Erikson (1951) emphasized the psychosocial significance of play, particularly during the early childhood stage of *initiative versus guilt*. Through fantasy and role-play, children experiment with social scripts and test boundaries, contributing to the development of ego strength and adaptive functioning (Erikson, 1951; Bruner, 1983). This reflects the developmental aspect of self-construction as articulated in Sutton-Smith's framework. Freud similarly viewed play as a symbolic space where children resolve unconscious conflicts and anxieties, projecting internal tensions onto manageable scenarios (Freud, 1955; Leontiev, 1981).

Later researchers like Jerome Bruner expanded the scope of play's developmental functions by highlighting its role in narrative construction, flexibility and hypothesis-testing. These cognitive tools allow children to explore possible futures and reframe uncertainty as possibility, fostering resilience and adaptive thought (Bruner, 1983; Rogoff, 1990; Merriam, 2009).

Together, these theories position play as a developmental engine an integrated process that fuses imagination, emotion and cognition. For designers of digital play environments, grounding design choices in these psychological foundations offers a pathway toward creating experiences that are not only engaging, but developmentally enriching (Moll et al., 1992; Scardamalia & Bereiter, 1991; Vygotsky, 1962; Cole, 1993).

3.4 Transition to Digital Play: Negotiating Meaning and Control

As digital platforms increasingly mediate children's experiences of play, the meaning and structure of play are no longer entirely generated through interpersonal negotiation or cultural tradition; they are now also shaped by system designers, monetization strategies and algorithmic logic (Salen & Zimmerman, 2004; Consalvo, 2009; Grimes et al., 2023). This transition marks a fundamental shift from play as an emergent, socially constructed activity to one that is often predetermined by rules encoded in software and governed by commercial objectives (Consalvo, 2009; Harvey, 2021). The notion of Huizinga's "magic circle", in which

play unfolds within a voluntary and separate domain, is increasingly complicated in digital spaces, where boundaries are porous and participation is conditioned by opaque terms of service, behavioral nudges and platform surveillance (Consalvo, 2009; Duffy & Derevensky, 2022).

In this new terrain, the agency of the player becomes a site of negotiation. While traditional play allowed for active reinterpretation of rules, many digital games enforce rule structures through hard coded limitations, microtransaction triggers and achievement loops (Xiao & Newall, 2021; Castillo, 2019). Raessens (2006) frames this as part of the broader "ludification of culture", where game mechanics become not only a mode of engagement but also a tool of control (Raessens, 2006; Consalvo, 2009). Players are invited to act freely, but within a tightly managed system of constraints, rewards and data feedback loops an illusion of freedom often masked by gamification techniques and aesthetic polish (Harvey, 2021; Linehan, Kirman, & Roche, 2015).

Beyond the concerns of commercialization and control, digital play also represents a potential extension of traditional play rather than its complete replacement. As Hargraves (2022) highlights, digital play occurs when children interact with digital tools in ways that mirror classical forms of exploration, creativity and role-play, blurring the lines between analog and digital experiences. When used intentionally, digital tools can foster problem-solving, social interaction and creative expression, while maintaining the essence of playful learning. Similarly, the Genius of Play initiative emphasizes that high-quality digital play, particularly when it is active, engaging, meaningful, socially interactive, iterative and joyful, can support children's developmental needs while protecting the core values of play (Hirsh-Pasek et al., 2020).

3.5 Synthesis: Understanding Play Across Contexts

Playing games is an integral part of human development, serving as a fundamental tool for learning, socializing and exploring (Garaigordobil et al., 2022). We do not play because

humanity has already developed; rather, we can say that humanity has developed and evolved through playing (Huizinga, 1938, p. 173; McDonald, 2019). Across history, games have transcended languages and nations, making our relationship with play more than a matter of tradition or nationality (Radoff, 2010; Gosso & Almeida Carvalho, 2013).

Play enables individuals to understand themselves, others, and their environment, while cultivating skills and motivations that support meaningful lives. It prepares children for adulthood by fostering motor skills, imagination and adaptive abilities, creating both a safe space for exploration and a foundation for lifelong learning (Sutapa et al., 2021).

As the earlier sections have underlined, play is cultural, structural, personal and developmental. It shapes identity and social connection (Sutton-Smith, 1997), functions as a space of imagination and self-expression (Sicart, 2014) and has historically driven both learning and adaptation. Humanity has always been intertwined with play; over time, we have evolved it, formalized it and eventually transformed it into a global industry. Today, digital games occupy a central role in childhood, with many parents introducing them as tools for both learning and entertainment (OECD, 2025; UNICEF Innocenti, 2025; Ofcom, 2025; Pew Research Center, 2024; Schmid et al., 2025; American Academy of Pediatrics, 2021; The Economist, 2023). This shift highlights the dual nature of modern play: it continues to nurture exploration and creativity, yet it increasingly unfolds within system-driven and commercialized environments.

Synthesizing insights from research on traditional and digital play highlights that a healthy play ecosystem depends on balance. High-quality play experiences regardless of medium share core features: they are active, meaningful, socially interactive, iterative and joyful (Hirsh-Pasek et al., 2020). When digital play aligns with these principles and involves co-play with adults, it can extend the personal and cultural functions of traditional play (Hargraves, 2022).

To visually synthesize the insights from this research, I applied a graphic recording technique (Figure 1) that maps the conceptual, personal and structural dimensions of play examined in this chapter (Firth, n.d.). This drawing serves as both a research output and a speculative artifact, capturing how play moves across cultural, developmental and digital contexts. It reflects the integrative understanding that play is not static: it evolves alongside society, technology and the lived experiences of children.

This synthesis closes the theoretical exploration of play and sets the stage for the next phase of the research: system-oriented analysis, where the focus shifts from understanding what play is to examining the structures, forces and interactions that shape children's digital play environments.

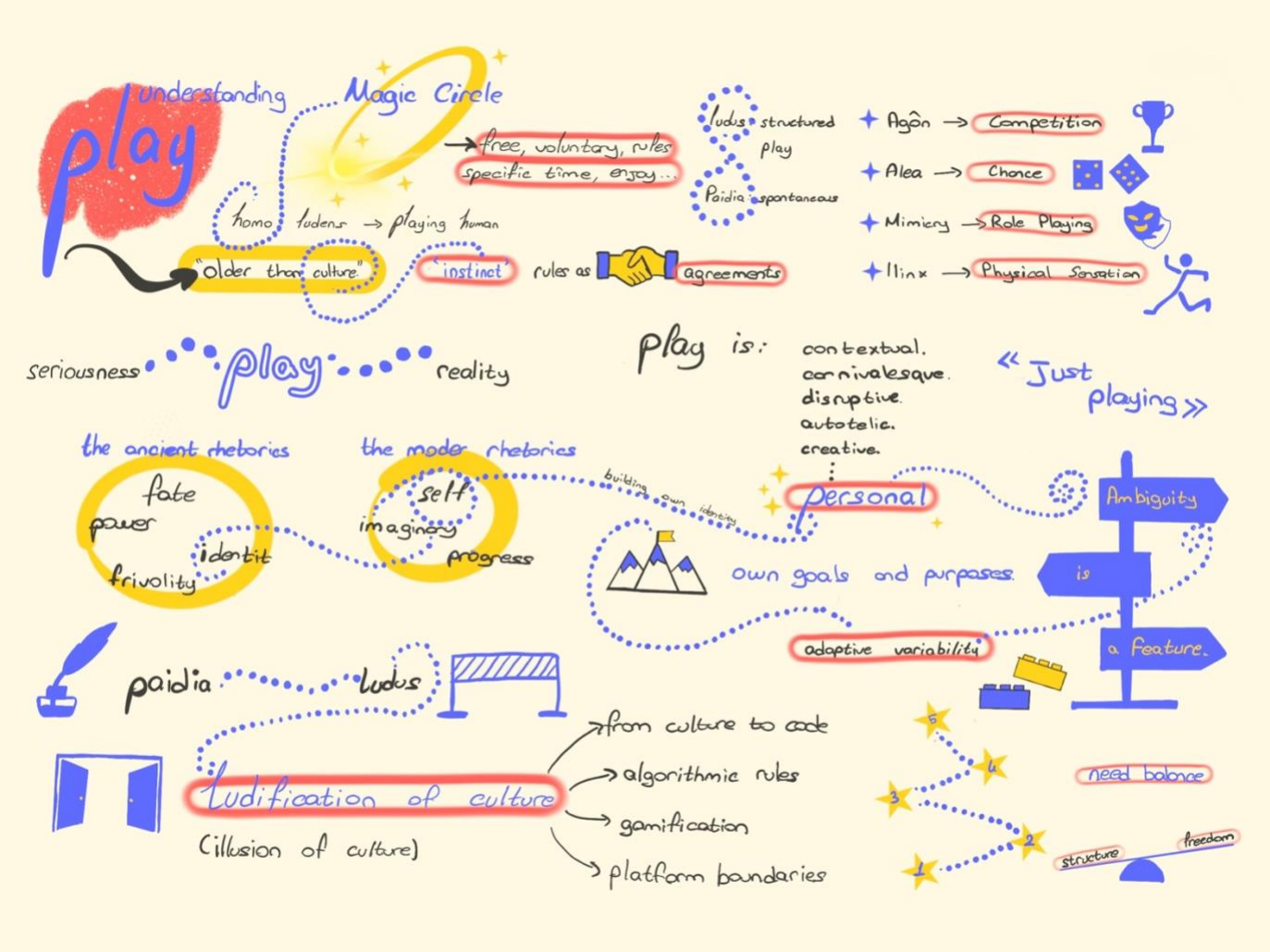

Figure 1. Graphic recording created by the researcher to visually synthesize the conceptual, personal, and structural dimensions of play. This drawing serves as both a research output and a speculative artifact

4. Mapping the Systems of Digital Play

4.1 Stakeholders and Hidden Power

Understanding how digital games are shaped requires more than simply analyzing what children do on screens; it also involves situating these practices within broader sociotechnical systems shaped by what Raessens (2006) calls the *ludification* of culture and by the hidden governance of commercial platforms (Grimes, 2021). Digital play is not spontaneous or neutral; it is shaped by the decisions of designers, platforms, and regulators, which determine what kinds of play are possible, whose perspectives are included and whose interests the system ultimately serves.

At the center of this ecosystem are children, the primary users of digital games. They hold the deepest experiential knowledge of play, yet in most systems, they have little or no say in how games are designed, managed or monetized. This reflects Sutton-Smith's (1997) argument that children's play cultures are often appropriated without granting them genuine agency. As illustrated in Figure 2, children occupy the core of the actor map, surrounded by proximal actors such as parents and educators and more distant institutional and commercial actors who hold disproportionate power over their experiences. Despite being the target audience, they are rarely included in conversations about quality, ethics or design, leaving them in the position of what Livingstone and Pothong (2022) describes as "powerless participants" (UNICEF, 2021).

Those closest to children's parents, caregivers and educators act as proximal mediators of digital play. They regulate access, content and routines, but their influence is domestic and reactive rather than structural. Parents may set timers, choose apps or co-play, yet these interventions often platform-driven engagement loops and fail to shift the underlying systemic incentives (Livingstone et al., 2015; UNICEF, 2021; Radesky, 2020). Ponti (2023) underscores this gap: only ~15% of Canadian preschoolers meet the recommended one hour of daily

screen time, reflecting that home-level mediation often struggles against systemic design for attention and retention.

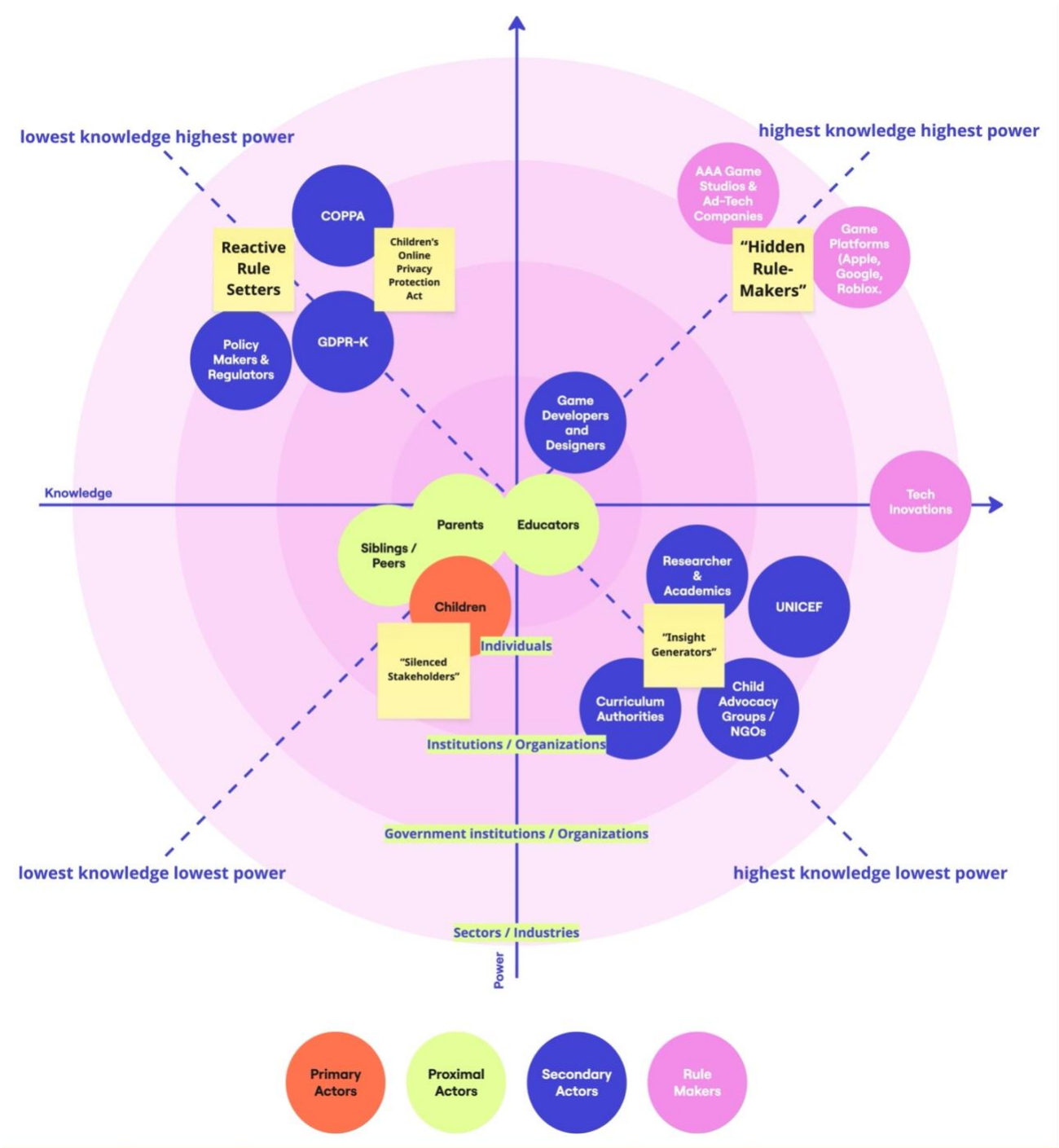

Figure 2. Actor map visualizing the power hierarchy in children's digital play.

The quality and impact of parental mediation is also shaped by parenting style, as described by Darling and Steinberg (1993). They conceptualize parenting across three layers:

- **Goals** – what kind of person parents hope their child will become, i.e., responsible, happy or successful.
- **Style** – the emotional and control climate they create, i.e., authoritative, authoritarian, permissive or neglectful.
- **Practices** – the daily behaviors and rules, such as limiting screen time or co-playing.

Critically, the effect of a digital rule depends on the style in which it is delivered:

- *Democratic parents* (warmth + structure) allow play with clear limits and collaborative choices, fostering self-regulation and trust.
- *Authoritative parents* (low warmth + high control) rely on bans or threats, which often fuel resistance or secretive play.
- *Permissive parents* (high warmth + low control) rarely regulate, risking overuse and weak self-control.
- *Neglectful parents* (low warmth + low control) provide minimal oversight, leaving children vulnerable to isolation or harmful content.

This aligns with Plowman's (2020) argument that digital play becomes more meaningful when parents shift from a purely controlling role to one of guided participation or co-play, helping children connect digital experiences to real-world exploration. Yet in the broader system, these parental actions remain reactive; they cannot independently address the structural asymmetry where platforms and commercial actors hold systemic power and children remain structurally silenced.

Slightly further afield are *researchers, NGOs, and child advocates*. These actors produce valuable insights into child development, digital safety and ethical design and they frequently

call attention to the developmental and social implications of digital play. Yet, as Grimes (2021) and Flanagan (2009) observe, these insights rarely translate into systemic changes within commercial platforms. Their influence is filtered through academic publications and policy reports rather than integrated into product roadmaps or platform decision-making.

At the top of the power and knowledge hierarchy sit *regulators* such as COPPA and GDPR-K enforcers, alongside major platforms (Apple, Google, Roblox), AAA game studios and ad tech companies. While regulators are typically reactive and narrow in scope, platforms operate as covert rule-makers: they govern participation through interface design, recommendation algorithms, monetization models and content moderation policies (Consalvo, 2009; Grimes, 2021). Their power is systemic and largely invisible to the public, reinforcing what Zagal et al. (2013) identify as dark patterns that subtly guide behavior and participation.

This actor map (Figure 2) demonstrates that the actors with the most power are often the least visible, while those with the richest lived experience children themselves remain structurally silenced. This mapping challenges the assumption that digital play is a neutral or balanced experience. Instead, it highlights the need for a shift toward critical, rights-centered and participatory design approaches that actively address inequities in voice, power and control (Flanagan, 2009; Grimes, 2021).

4.2 Visible Events and Invisible Structures

Play is a core part of early childhood and a recognized right under Article 31 of the UN Convention on the Rights of the Child. Yet, when play shifts into digital spaces, it takes on a different character. It becomes more structured, more closely steered by adult intentions and platform logic and less centered on children's spontaneous imagination and agency.

The most visible aspects of this shift appear on the surface. Many children's games are saturated with advertisements, in-app purchases, and repetitive reward loops that prioritize tapping and collecting over open exploration. Educational titles promise learning but often

reduce it to point-scoring, memorization or rapid responses. Parents frequently respond with home-based strategies timers, filters and screen-time limits yet these actions rarely penetrate the actual quality of the experience (Grimes, 2021; UNICEF, 2021). As Ponti (2023) observes, only a small proportion of Canadian preschoolers meet the recommended daily screen-time limit of one hour, illustrating that domestic interventions often struggle against engagement loops intentionally built to retain attention.

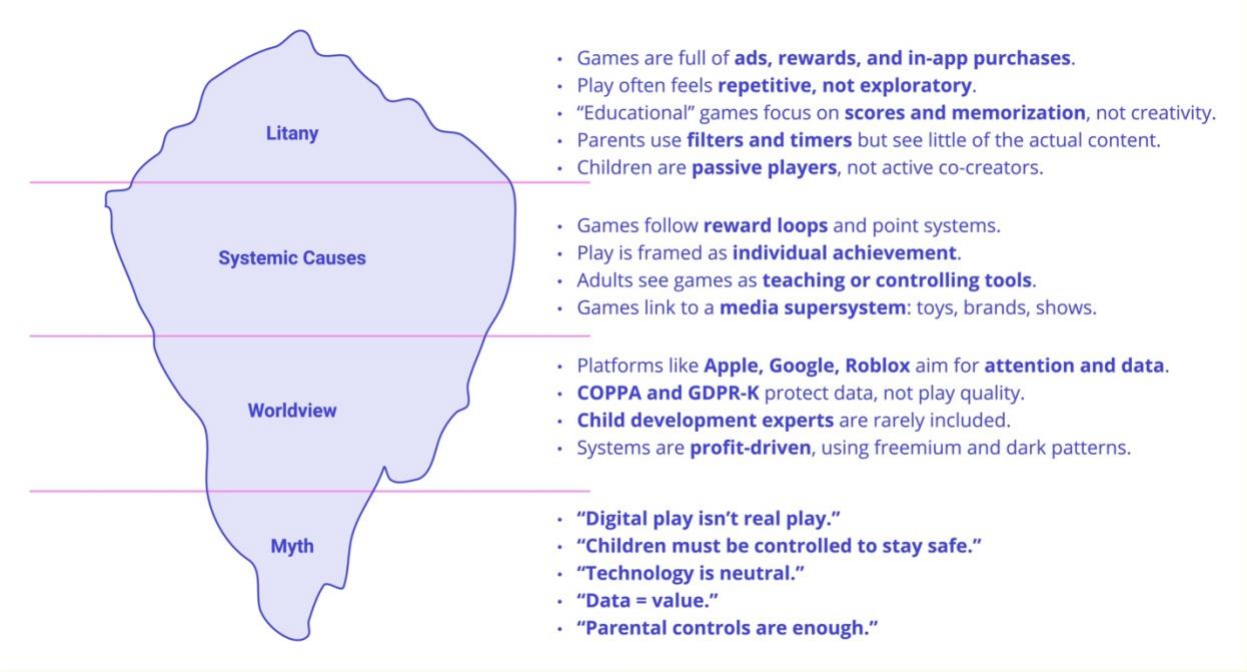

Figure 3. Causal Layered Analysis (CLA) of children's digital play, showing how surface level complaints (litany) are reinforced by systemic patterns, platform driven worldviews, and underlying cultural myths.

Beneath these surface events lie systemic patterns. Children's games are frequently designed around points, levels, streaks and badge collections mechanics that define success in quantifiable terms rather than through creativity or self-directed storytelling. This design reflects an adult-centered orientation: games aim to teach, control or occupy, rather than to allow children to lead or transform the experience. Sutton-Smith's (1997) notion of adaptive variability the way children reshape traditional play to suit changing social contexts is muted in these environments. In Caillois's (1958) framework, digital play drifts from the open,

improvisational qualities of *paidia* toward the rigid structure of *ludus*, where external rewards gradually replace intrinsic curiosity.

Parental style mediates how children experience this structural shift. Darling and Steinberg (1993) highlight that the same digital rule can have different developmental outcomes depending on the emotional climate in which it is delivered. Authoritative parents, combining warmth with clear expectations, can turn a screen-time limit into a collaborative routine that fosters self-regulation and trust. Authoritarian approaches often provoke resistance or secretive play, while permissive or neglectful environments leave children vulnerable to overuse and the persuasive logic of platform design. Plowman (2020) further emphasizes that digital play becomes more meaningful when adults move from a monitoring role to one of guided participation or co-play, helping children link digital experiences to reflection, storytelling and real-world exploration.

At the deepest level, cultural beliefs and systemic myths silently shape how digital play is designed and understood. Major platforms such as Apple, Google, and Roblox operate as invisible regulators, setting participation boundaries through interface choices, recommendation algorithms and monetization models, while regulatory frameworks like COPPA and GDPR-K primarily address data protection rather than the substance of play (Livingstone & Pothong, 2022; Grimes, 2021). These structures are underpinned by unspoken assumptions: that digital play is less "real" than traditional play, that children require strict control to remain safe, and that engagement and data equate to value. Such myths act as an operating system in the background, shaping both platform decisions and parental responses. These visible and invisible layers suggest that surface-level fixes removing ads, setting timers, or labeling apps as educational are insufficient. Meaningful change requires interventions that reach into the structural and cultural foundations of digital play, combining systemic design reforms with parental mediation that emphasizes warmth, guidance and shared exploration.

Only by addressing these underlying patterns can digital games reclaim the essence of play freedom, creativity and joy.

4.3 Cycles of Attention and Monetization

Understanding the dynamics of digital play requires moving beyond individual gameplay to consider the self-reinforcing loops that drive platform behavior. Building on the Actor Map and Causal Layered Analysis (CLA), which revealed children as structurally silenced actors in digital play ecosystems, this section examines the recurring cycles that shape their experiences. These loops demonstrate how commercial design logics, parental mediation and systemic exclusions interact to define what play becomes in digital spaces (Salen & Zimmerman, 2004; Zagal et al., 2013; Grimes, 2021).

Commercial Optimization Loop

The first pattern is the Commercial Optimization Loop, which shows how digital games prioritize engagement and monetization over the essence of play. Children are guided through points, streaks and microtransactions that reward repetition rather than open exploration (Harvey, 2021).

From a child's perspective, this loop feels like constant nudging small incentives that keep them tapping, collecting and returning. The experience is active on the surface, but it rarely invites creativity or improvisation. Over time, the qualities that make play meaningful freedom, curiosity and intrinsic motivation are eroded, replaced by predictable, profit-oriented routines (Sutton-Smith, 1997; Sicart, 2014).

This loop also reflects the structural priorities of the platform economy. Retention is more valuable than discovery and micro-transactions take precedence over open-ended engagement. What looks like play is an optimized engagement funnel.

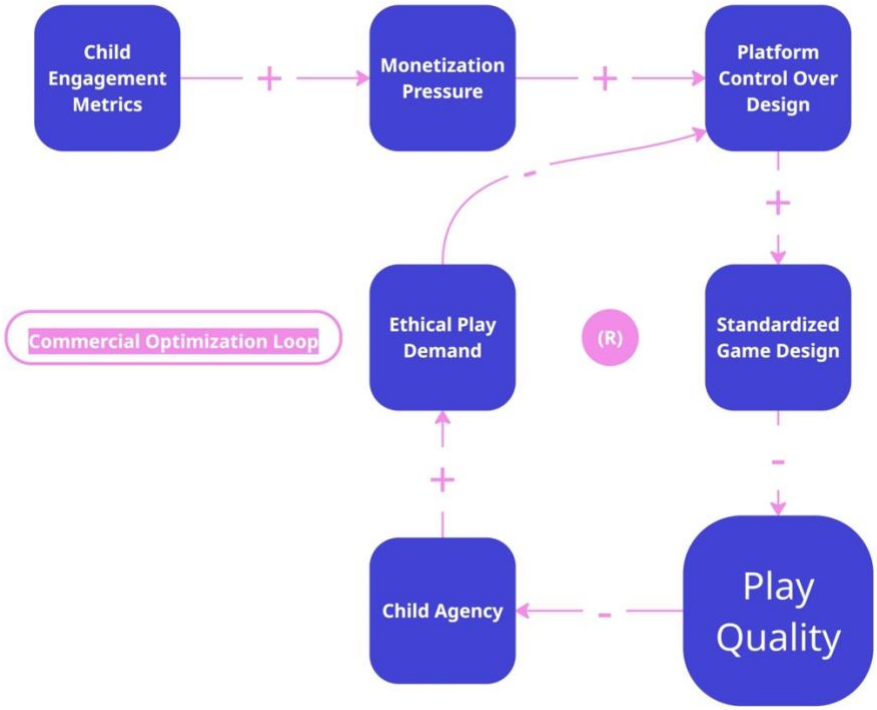

Figure 4. Commercial Optimization Loop.

Safety-Control Feedback Loop and Delayed Reform Loop

The second set of loops captures how parents and platforms respond to the pressures created by commercial design. Parents often notice when games feel shallow or overly commercialized. Their instinct is to limit, block or supervise through timers, filters or strict screen-time rules (Radesky, 2020). This forms the Safety-Control Feedback Loop, which provides short-term reassurance but also narrows the child's play freedom. In democratic parenting climates, this can become a moment of co-regulation and trust; in authoritarian climates, it often creates tension, secretive play, or resistance (Darling & Steinberg, 1993; Livingstone et al., 2015).

At the platform level, concerns trigger the Delayed Reform Loop. Companies introduce dashboards, age labels and parental controls that signal responsibility but leave the core monetization logic intact (Grimes, 2021; Zagal et al., 2013). These gestures buy time, reducing

public pressure without producing systemic change. The loop sustains a cycle where appearance of safety masks structural inaction, and the quality of children's digital play remains stagnant.

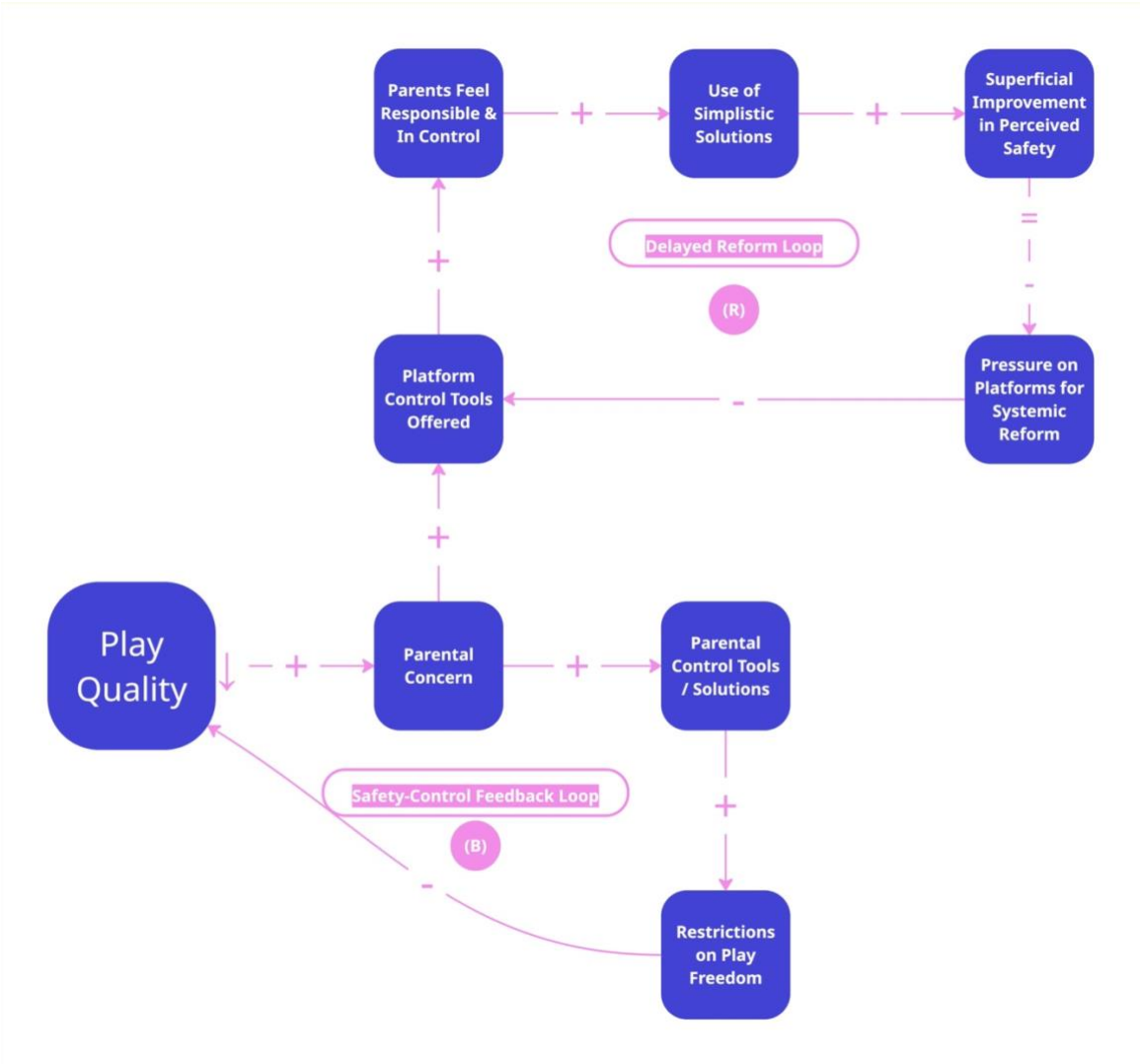

Figure 5. Safety-Control Feedback Loop and Delayed Reform Loop.

Figure 5 visualizes how these loops interact to perpetuate a cycle of restricted play and delayed systemic change.

Blocked Participation Loop

A deeper systemic tension emerges in the Blocked Participation Loop, which exposes how children's voices are excluded from the design of the games they play. Children naturally approach play with expressive, adaptive and exploratory tendencies, improvising rules and reshaping games to fit their social world. In most digital spaces, these instincts are constrained. Experiences are pre-structured for discipline, education or marketability, reflecting adult expectations rather than child agency.

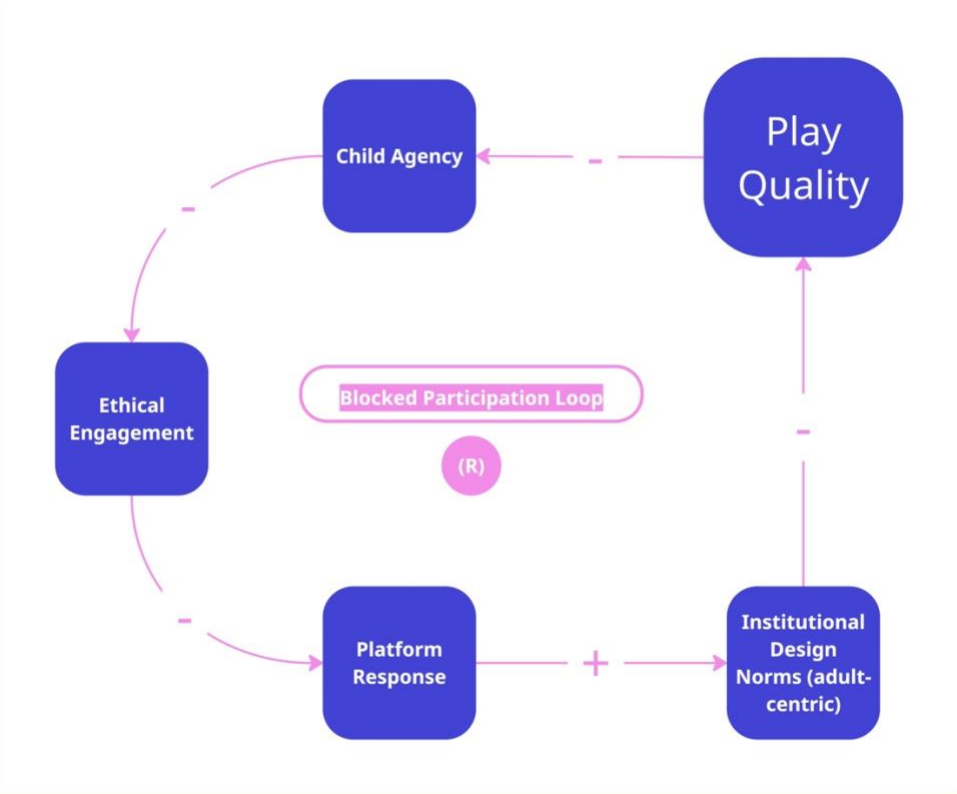

Figure 6. Blocked Participation Loop.

This exclusion is neither neutral nor natural. By silencing the actors with the richest experiential knowledge of play, the system reproduces a top-down model of childhood: children consume experiences, but they do not help define them. Over time, this loop diminishes autonomy, self-expression and the sense of ownership that make play developmentally powerful.

Developmental Mismatch Loop

The final loop highlights the gap between platform design and developmental need. Many games prioritize badges, coins and level progression over storytelling, narrative building or imaginative risk-taking. From a developmental perspective, this creates a mismatch. Cognitive and emotional growth is nurtured through symbolic play, problem-solving and narrative exploration (Piaget, 1962; Bruner, 1983). Games that only offer repetitive reward cycles fail to engage the full spectrum of cognitive and social capacities, leading to experiences that are either shallow and short-lived or compulsive and hard to disengage from.

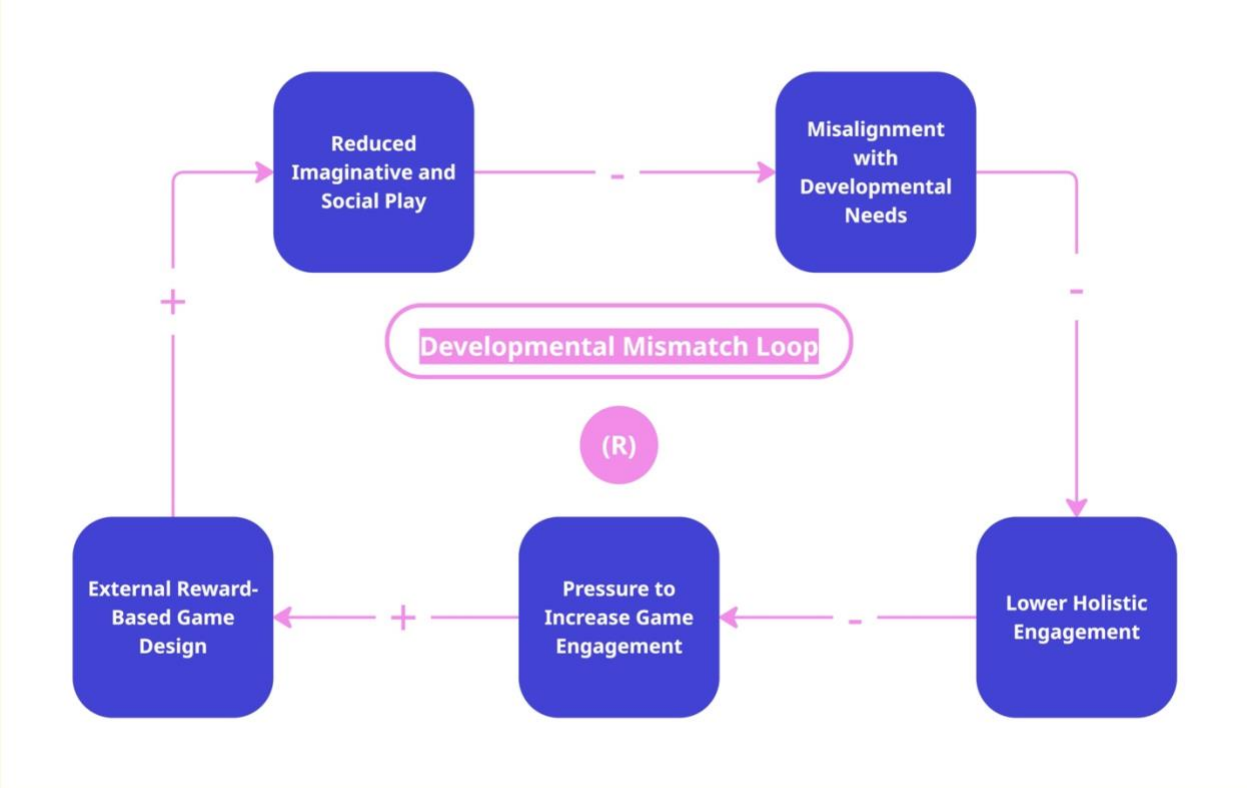

Figure 7. Developmental Mismatch Loop.

This loop also reinforces the others: the more games focus on extrinsic rewards, the more parents intervene, the more platforms optimize for short-term engagement and the further play drifts from its developmental potential.

Synthesis: Loops, Parenting, and Systemic Pressures

Taken together, these loops reveal a self-reinforcing system where commercial imperatives, protective parental impulses and platform governance converge to shape a version of digital play that is adult-centered and developmentally constrained. Yet, it is important not to frame this as a failure of parents. In a healthy environment, parents are expected to protect their child without constantly mediating the act of play itself. In digital contexts, however, the structural design of platforms forces parents into a state of intervention, making them gatekeepers of an experience that should, by its nature, belong to the child.

This pressure produces a subtle distortion in the meaning of play for the child. In theory, a child's "work" is to play an activity that nurtures imagination, autonomy and social connection. But in digital spaces saturated with reward loops and surveillance-driven safety mechanisms, the child may begin to associate play less with freedom and more with adult supervision, restriction or negotiation. The natural flow of agency that defines childhood play is interrupted by systemic conditions that ask the child to perform within adult-imposed frames.

As Darling and Steinberg (1993) note, parenting unfolds across goals, style and daily practices, and the same digital play rule can land very differently depending on that climate. A democratic home can buffer some of these systemic effects, while authoritarian or neglectful homes often amplify the loss of agency and creativity. Yet, *the deeper issue lies not in individual parenting choices but in a system that requires parents to act as constant mediators rather than occasional protectors.*

This contrast becomes clearer when I reflect on my own childhood. I would spend hours playing in the garden with the neighbors' children, inventing games and getting completely absorbed in them. Years later, in a conversation with my mother, I learned that the parents in the building watched us from the balconies to make sure we were safe. They were present, but they didn't step into the game, the space of play was ours, and their role was simply quiet supervision.

What these loops and parental dynamics together reveal is that healthy digital play cannot emerge solely through parental vigilance or domestic rules. Real change depends on system-level interventions platform governance that respects child agency, designs that reduce manipulative loops, and digital spaces that allow children to experience play as their own. Only under such conditions can digital play recover its original qualities of freedom, creativity and intrinsic joy.

5. Participatory Insights: Workshop Findings

The workshop generated a combination of written reflections, scenario maps and visual artifacts that captured participants' memories, ideas and design principles about play. To make sense of these materials, I conducted a simple thematic analysis. Specifically, I used an inductive approach: first-cycle descriptive/in-vivo coding of sticky notes and scenario narratives, followed by second-cycle pattern coding to cluster recurrent meanings. Patterns were considered robust only when they recurred across both groups and across both scenario types (utopia and dystopia), and I maintained an audit trail (code → pattern → principle). I reviewed all individual and group outputs to identify recurring patterns across emotions, values and tensions that appeared in different activities. These patterns were not pre-defined; they emerged from the workshop process itself.

This approach allowed me to connect participants lived experiences and speculative ideas to broader discussions in the literature on digital play. For example, recurring tensions between freedom and control, isolation and connection and commercial logic and child agency echoed findings by Sutton-Smith (1997), Grimes (2021) and Flanagan (2009). By using this analytical lens, the workshop findings can be structured into four sub-sections: memory and imagination, scenario mapping, play principles, and collective visions of future play.

5.1 Workshop Format and Structure

The workshop format was partially inspired by early childhood innovation practices, as documented by the OpenIDEO Istanbul Chapter (OpenIDEO, 2018). While the reference provided an initial structure for combining memory-based and speculative exercises, the final format was adapted to focus on digital play and participatory foresight rather than directly replicating the original workshop.

The workshop was structured as a half-day session, moving from personal memories of play to critical reflection on today's digital play environments and finally to speculative exercises imagining future scenarios. Six graduate students from OCAD University took part. We began by inviting them to recall a childhood moment when play felt most genuine and to consider what made it so. This opened a space for shared reflection, leading into a collective "What is playing to you?" mind map. From there, participants continued in groups of three, building on each other's perspectives. The intent behind this workshop was to bring diverse voices into the project and to ground future-facing ideas in the lived experiences of play.

Step 1 – Memory Echo

Participants began by recalling moments of true play from their childhood. They noted sensory and emotional details of what they felt to identify qualities that make play meaningful, such as freedom, improvisation and joy. This created a shared emotional baseline for later discussions.

Step 2 – Digital Game World

Participants then imagined themselves as children inside today's digital game world. This reflection revealed current experiences of digital play, highlighting both opportunities (learning, connection) and concerns (addiction, data collection, isolation).

Step 3 – Defining a Theme

Each group created a core theme that captured the tensions in digital play, such as balancing curiosity and control or environments and cultures of play. This theme acted as a lens for deeper systemic exploration.

Step 4 – Scenario Mapping (Utopia/Dystopia)

Groups created utopian and dystopian scenarios imagining how their theme might evolve in the future what we called "envisioning the best and worst scenarios." Working at these extremes helped participants move beyond current constraints, surface assumptions and value trade-offs, and define both design guardrails (what to avoid) and target qualities (what to aim for). This speculative exercise helped participants think beyond current constraints and envision digital play environments that prioritize agency, creativity and ethical engagement over monetization or control.

Step 5 – Assessment and Play Principles

Finally, participants identified patterns and design principles based on their scenarios. These principles captured what a healthier digital play ecosystem could look like, emphasizing child agency, transparency and community-centered design.

This structured progression from personal to systemic and from analysis to imagination mirrors the approach in participatory foresight and aligns with methodologies described by Jones (2014) and Candy & Dunagan (2017). It allowed participants to articulate not only what is happening in digital play but also what could change.

5.2 Memory, Imagination and The Echo of Play

The workshop began with a short reflective exercise that asked participants to *Step 1: recall a moment from their own childhood when they felt they were truly playing.* They were invited to

close their eyes, step back into that moment, and write for three minutes about what they saw, heard and felt.

This exercise was intentionally simple but powerful. It anchored the group in lived, embodied memories before any abstract thinking about digital play. Most memories had common traits:

- **Unsupervised freedom** – Participants described running outside, climbing, hiding or inventing rules without adult interference.
- **Sensory richness** – Sand, snow, water, grass and laughter appeared repetitively.
- **Open-endedness** – There were no scores or achievements; the "goal" was the experience itself.
- **Shared joy** – Even solitary memories often carried a sense of social connection or imagined companionship.

These recollections formed what we called the echo of play. They became a baseline for later discussions, a reminder of the emotional, physical and imaginative qualities that make play meaningful.

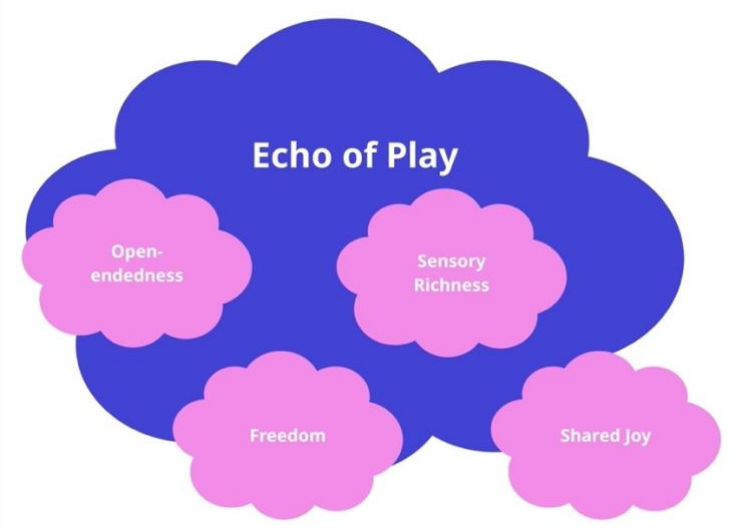

Figure 8. Themes from childhood play memories: freedom, sensory richness, open-endedness, and shared joy (Workshop Step 1).

In the context of the study, these memories also provided a contrast: participants could easily sense how digital play often lacks this open, sensorial quality.

5.3 Experiencing the Digital Game World and Defining Themes

The workshop began by inviting participants to immerse themselves in the current landscape of children's digital play. In Step 2: Digital Game World – Imagining Play Today, each group was asked to imagine living as a child inside today's digital game world. This prompt produced immediate reflections on the qualities and tensions of contemporary play:

- **Ease of access and boundaryless environments** were noted as defining features. Children can enter digital worlds quickly, but this freedom often leads to fatigue, difficulty to stop playing and experiences of overexposure.
- **Opportunities for learning and exploration** were also acknowledged, including exposure to languages, cultures and neurodiverse representations.
- **Safety and surveillance** emerged as recurring concerns. Participants noted risks of data collection, manipulation and exposure to harmful interactions or hidden ideologies.
- **Isolation versus connectivity** became a central tension. Digital play connects children globally yet often takes place in physical isolation from peers and family.

These reflections set the stage for Step 3: Defining a Theme, where each group identified a central idea that captured their concerns and aspirations for digital childhood:

- **Group 1: Balancing Curiosity and Control** – The tension between children's desire for exploration and the need for structure and protection.
- **Group 2: Environments and Cultures of Play** – The understanding that digital and physical environments shape the culture of play, which in turn shapes identity and belonging.

These themes served as conceptual anchors for the remainder of the workshop. They guided participants as they developed utopian and dystopian scenarios (Step 4) and design principles (Step 5), linking personal memories and present experiences to systemic reflections about the future of play.

5.4 Utopia/Dystopia Mapping of Digital Childhood

After defining their central themes, participants were guided through Step 4: Scenario Mapping, a foresight activity where they explored the present state, a dystopian trajectory and a utopian vision of digital childhood. This exercise encouraged participants to consider how current trends might evolve and what futures they would prefer to create or avoid.

Current State

Participants across both groups described today's digital play as simultaneously open and constrained. Children can access games and platforms easily, yet their experiences are heavily shaped by commercial patterns, parental mediation and platform rules. Screens dominate attention, physical interaction is reduced, and meaningful self-directed play is often replaced by repetitive engagement loops.

Dystopian Scenarios

When projecting into an undesirable future, participants envisioned digital play as a site of deep loss of agency. Children become passive subjects within algorithmically controlled systems where:

- Data exploitation and surveillance drive design decisions.
- Addictive reward loops replace curiosity and self-expression.
- Cultural homogenization occurs, with digital spaces erasing local diversity and imagination.

- Physical and social isolation intensifies, with digital life displacing outdoor and communal play.

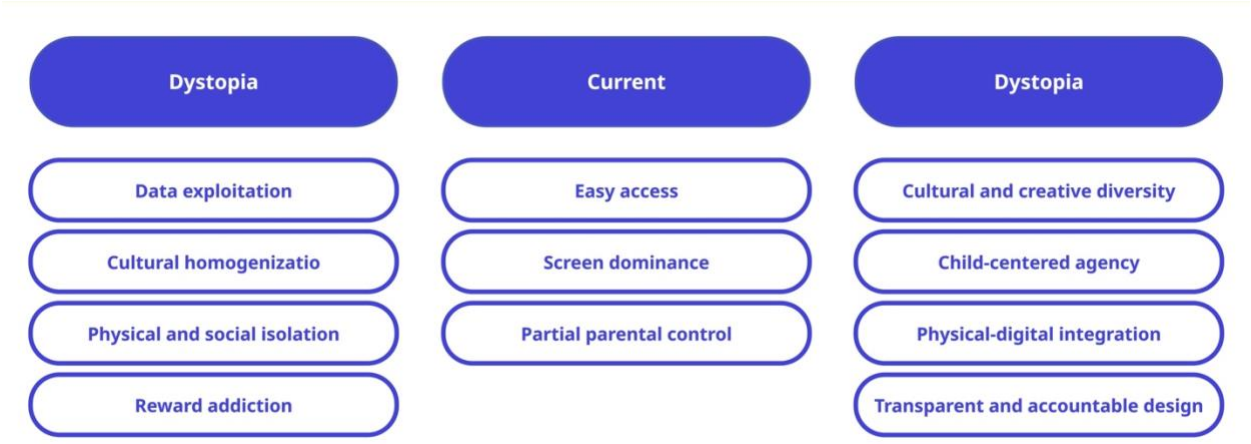

Figure 9. Comparative scenario map of digital childhood: current, dystopian, and utopian trajectories (Workshop Step 3).

This scenario reflects the risks of adult-centered, extractive design where play primarily serves commercial or behavioral agendas.

Utopian Scenarios

Conversely, participants imagined a future where digital play could support flourishing and connection. This vision emphasized:

- Transparent and accountable design, where children and caregivers understand how platforms operate.
- Integration of physical and digital play, maintaining embodiment and social interaction.
- Cultural and creative diversity, with games supporting local languages, shared storytelling and collaborative creativity.
- Child-centered agency, where children's choices, voices and imaginative contributions shape their play environments.

Both groups framed utopia not as a rejection of technology, but as a reorientation of design toward care, inclusion and imagination.

Key Insight

The scenario mapping revealed that the core tension of digital play lies between openness and control. Futures diverge depending on whether platforms remain extractive and opaque or evolve into participatory and ethically guided ecosystems. These insights directly informed the design principles developed in the next phase of the workshop.

5.5 Play Principles

Following the scenario mapping, participants engaged in *Step 5: Design Principles, where they translated their insights into practical guidelines for reimagining digital play*. These principles emerged from the tensions between openness and control, autonomy and protection, creativity and commercialization identified in previous steps.

Method notes — Participant-articulated principles and cross-step verification. The design principles reported here were produced by participants in Step 5 (Define Design Principles). My analysis did not derive new principles; it verified and lightly standardized participants' formulations by cross-checking them against earlier artefacts (Steps 1–4). I applied first-cycle in vivo coding to sticky-note clusters and scenario narratives, then grouped recurring meanings through second-cycle pattern coding. Where an idea appeared across multiple artefacts, I documented the recurrence; where evidence was limited or ambiguous, I retained the participant phrasing and treated the finding as indicative rather than confirmatory. A brief audit trail (code → pattern → principle) is provided to support transparency and reliability.

Across both groups, five recurring principles were articulated:

- **Accountability and Transparency** – Platforms and developers must be responsible for the consequences of their design choices. Interfaces, algorithms and monetization strategies should be visible and understandable to both children and caregivers.

- **Child-Centered and Participatory Design** – Children should be recognized as active participants in shaping their play environments. Their voices can guide decisions about game mechanics, narratives and the balance between freedom and structure.
- **Integration of Physical and Digital Play** – Digital play should complement rather than replace embodied, social and outdoor experiences. Play that bridges digital and physical spaces support healthier developmental outcomes.
- **Community and Connection** – Games should strengthen relationships between peers, families and broader communities rather than isolate players in algorithmically curated bubbles.
- **Equity and Access** – Core experiences of digital play should be free from exploitative paywalls or dark patterns. Equity in access ensures that meaningful play is not limited to children with higher socioeconomic privileges.

These principles move beyond critique toward constructive, future-oriented guidance. They reflect a collective aspiration to restore agency, creativity and joy to digital childhood, while also embedding ethical responsibility into the design of platforms and games.

Figure 10. Synthesized design principles for healthier digital play (Workshop Step 5).

As with the previous steps, these principles highlight a systemic perspective: meaningful change in digital play cannot be achieved through individual parental control or content moderation alone. It requires rethinking the infrastructures of design, participation and governance.

5.5.1 Verification of Principles

A compact audit trail showing how participant-articulated statements are supported by cross-step evidence (codes/patterns) and thus *retained and reported* as principles.

In-vivo Code (evidence)	Pattern / Tension	Principle
"**are explicit (not in tiny prints) about all the known risks**" *(Workshop board; Map Three Perspectives*	**Opacity → Legibility** (safety/surveillance vs agency)	Accountability & Transparency
"**My data not being used against me or sold to third parties**" *(Workshop board; Digital Game World)*	**Exploitation → Protection**	Accountability & Transparency
"a game that **acknowledges life outside the digital** game and **encourages in-person play**" *(Workshop board; Digital Game World (Step 2))*	**Embodiment → Screen-bound**	Integration of Physical & Digital Play
"**initiated in the digital world** but **executed in the physical** world" *(Workshop board; Map Three Perspectives)*	**Hybridizing contexts**	Integration of Physical & Digital Play
"**help build social fabric and community connections**" *(Workshop board; Map Three Perspectives)*	**Isolation → Connection**	Community & Connection
"**can play with friends from different cities/countries**" *(Workshop board; Digital Game World)*	**Local → Networked belonging**	Community & Connection
"**Fosters equitable access** to education, **is welcoming**" *(Workshop board; Define Design Principles)*	**Gatekeeping → Inclusion**	Equity & Access
"**Co-creation of games with parents, educators and developers**" (Workshop board; Define Design Principles)	**For children → With children**	Child-Centered & Participatory Design

Table 1. Verification table (code → pattern → principle) from workshop artifacts.

Principles were articulated by participants in Step 5. This table documents how each principle is corroborated by in-vivo codding quotations from the boards (Map Three Perspectives, Digital Game World, Define Design Principles) and grouped under the underlying tensions/patterns. The audit shows cross-checking/verification, not re-derivation.

6. Reimagining Play Possibilities

Digital play does not exist in isolation; it is shaped by platform logic, parental mediation, and the commercial imperatives of the game industry. In earlier sections, I examined how children's play has shifted from spontaneous, peer-driven activity (Section 3) to environments heavily mediated by design, monetization loops and systemic asymmetries (Section 4). Through the workshop (Section 5), I also explored how participants, drawing on personal memories and speculative thinking, envisioned healthier, more imaginative digital futures.

Building on these insights, this section uses the Three Horizons Framework (Sharpe, 2013) to frame a developmental arc for digital play:

- **Horizon 1** – Today's dominant pattern: adult-centered, commercialized and reactive.
- **Horizon 2** – Transitional signals: emerging experiments, policies and technologies that hint at change but remain partial.
- **Horizon 3** – Child-centered futures: an aspirational vision of play as autonomous, creative and safe-by-design.

This section proceeds from Horizon 1 (current patterns) to Horizon 3 (preferred future) and then articulates Horizon 2 as the transitional pathway between them. This ordering clarifies direction and, in turn, connects the system analysis with speculative design showing how digital play can move from current constraints toward futures that honor children's agency and developmental needs.

6.1 Horizon 1 – Present and Persistent Patterns

Today's digital play landscape is marked by a tension between children's natural drive for exploration and the commercial priorities of platforms. Most games aimed at children emphasize retention and monetization through points, streaks and microtransactions, creating loops that reward repetition rather than curiosity (Harvey, 2021; Sicart, 2014). This reflects Sutton-Smith's (1997) observation of a drift from *paidia*, free and improvisational play, to *ludus*, rule-bound and goal-oriented structures.

This environment shifts the burden of safety and balance onto families. Platforms act as covert rule-makers, shaping how and when children play, while parents are expected to mitigate risks (Consalvo, 2009; Radesky et al., 2020). Yet, this reactive role was not a dominant part of the natural rhythm of childhood play. In today's digital ecosystem, platforms are designed to demand active parental intervention; thus, light-touch supervision by parents is almost impossible.

Through the workshop (Section 5), I also explored how participants, drawing on personal memories and speculative thinking, envisioned healthier, more imaginative digital futures. Workshop specifics (H1). Current-state notes repeatedly point to disengagement difficulty and overexposure (e.g., "fatigue due to excessive screen time," "just addicted to screens and no other interaction"), alongside social thinning ("lack of human connection as engagement mostly happens online"). Participants also flagged supervision burdens ("difficult: supervision, addiction and online scams") and opacity in risk communication (the later demand that developers be "explicit (not in tiny prints)" implies current warnings are hard to read or locate). Together, these observations depict accessible yet constrained play joyful on the surface, structured by commercial incentives and adult control underneath.

Horizon 1, then, is a system of accessible but constrained play: joyful on the surface yet fundamentally mediated by adult control and commercial design. It sets the stage for transitional efforts to break this cycle.

6.2 Horizon 3 – Preferred Futures

If Horizon 1 illustrates the constraints of commercialized, adult-centered play, Horizon 3 invites a reimagination of play as child-centered, participatory, and developmentally aligned. In this horizon, digital play no longer depends on constant parental policing or opaque engagement loops. Instead, systems are safe by default, structurally supportive and designed to restore the ambiguous, self-directed qualities of play that Sutton-Smith (1997) describes as central to childhood.

This vision resonates strongly with the workshop findings in Section 5. In the utopian maps, participants described digital spaces that keep embodiment and sociality in view environments that "acknowledge life outside the digital and encourage in-person play" and "games that are initiated in the digital world but executed in the physical world." They also asked for legible defaults, with developers being "explicit (not in tiny prints) about all the known risks" and promises such as "my data not being used against me or sold to third parties." Community was framed as a design outcome rather than a by-product: notes called for games that "help build social fabric and community connections" and enable play "with friends from different cities/countries." Several items foregrounded equity and rights "fosters equitable access to education and is welcoming" and "data/personal privacy guaranteed." Taken together, these preferences align with the principles reported in Section 5 (Accountability & Transparency; Child-Centered & Participatory Design; Integration of Physical & Digital Play; Community & Connection; Equity & Access) and specify the target qualities against which transitional moves are assessed. This was contrasted with dystopian visions dominated by constant control, commercial loops and isolation, reflecting the dynamics of Horizon 1. Therefore Horizon 3 aligns closely with the play principles co-developed in the workshop: prioritizing agency, imagination, ethical design and community engagement.

In a Horizon 3 world, digital spaces embrace the ambiguous nature of play, allowing children to reinterpret rules, experiment with narratives and generate personal meaning. This flexibility

not only supports creativity and identity formation but also mirrors the open-ended, sensorial memories of childhood play those participants recalled in the workshop. Instead of being nudged along pre-programmed loops, children can co-create worlds, shifting digital environments from sites of consumption to spaces of authorship.

6.3 Horizon 2 – Transitional Signals and Ambiguous Innovations

Orientation. In this study, Horizon 2 is *back-casting* from Horizon 3. A signal or intervention is treated as meaningful when it measurably moves practice from H1 toward H3 especially along the axes of agency, transparency, embodiment, community, and equity.

Horizon 2 occupies the in-between: a zone where partial solutions, policy reforms, and design experiments signal change without fully escaping Horizon 1's incentive logic. On the policy side, frameworks such as COPPA, GDPR-K, and UNICEF's RITEC have made children's privacy, safety and rights more salient; similarly, analyses by OECD and Grimes et al. (2024) argue for healthy-by-default ecosystems that shift risk management away from families and toward systemic design (see also Radesky, 2020; OECD, 2023).

At the technological and cultural level, four signals highlighted by Hunter (2023) are treated here as Horizon-3 enablers rather than generic innovations. Hybrid/mixed-reality play reconnects digital activity with movement, place, and outdoor exploration, directly advancing embodiment. AI-assisted personalization for creativity functions as a tutor for making and learning (rather than retention), strengthening agency. Collaborative digital storytelling enables children to co-author worlds with peers (and sometimes AI), expanding community and lived authorship. Local networked platforms reposition children from passive consumption to production, opening space for equity and participatory voice. In this study, a signal is counted as H3-enabling when it demonstrably shifts one or more of the five axes and reduces dependence on parental policing and streak-based engagement.

Workshop specifics (H2), participants described bridging moves with potential to shift practice toward the Horizon 3 qualities. First, hybrid play activities "initiated in the digital… executed in the physical" was seen to reintroduce movement, place, and peer interaction, and to keep "life outside the digital" in view. Second, legibility by default was repeatedly requested: developers should be "explicit (not in tiny prints)" about risks, data practices, and reward cycles, with controls that reshape incentives rather than merely track time. Third, participants pointed to governance levers (e.g., minimum-age social-media legislation, standards set by trusted regulators, and dissemination of impact research) as necessary complements to product-level tweaks. By contrast, dashboards, timers and labels were often described as surface-level when core engagement/monetization loops remained unchanged.

In short, Horizon 2 is a transitional zone of tension and promise: signals exist and sometimes align strongly with the target state, but their value depends on how far they materially move the system along the five axes toward Horizon 3.

7. Synthesis & Interventions

7.1 Synthesis of Key Insights

Across the previous sections, this research has explored the nature of play, the systemic structures of digital game environments and the lived insights generated through participatory workshops. Taken together, these layers reveal a digital play ecosystem that is rich with potential yet misaligned with qualities that make play developmentally and culturally meaningful.

First, play in its natural form as understood through Huizinga (1938), Caillois (1958), Sutton-Smith (1997) and Sicart (2014) is voluntary, adaptive and intrinsically motivated. It thrives in contexts that allow children to explore, negotiate rules and create meaning. Yet, in the current digital ecosystem, much of children's play is filtered through platform logic and

commercial imperatives. Engagement loops, in-app purchases and streak-based rewards reframe play as performance and retention, eroding freedom and intrinsic curiosity.

Second, the burden of mediation has shifted disproportionately onto parents. Platforms operate as covert rule-makers, setting the rhythms and incentives of play while leaving families to act as gatekeepers. This is an inversion of light-touch supervision typical of healthier play contexts and risks narrowing children's felt agency by making adult policing a default condition of play. This is an inversion of light-touch supervision typical of healthier play contexts and risks narrowing children's felt agency by making adult policing a default condition of play.

Third, children remain structurally silenced in the design of the very games they play. As revealed in Section 4's actor maps and loops and reinforced by workshop findings, children are at the center of the experience but the periphery of decision-making. Their rich experiential knowledge of the improvisational, sensory and social qualities that define true play is rarely incorporated into game development or platform governance. This absence contributes to the developmental mismatch loops, where games offer extrinsic incentives but neglect the narrative, symbolic and social dimensions critical for growth.

Finally, the workshop provided a human lens to these systemic insights. Participants repeatedly evoked memories of free, open, and joyful play a sensory and social richness that contrasts with the constrained, surveilled and reward-driven nature of most digital play. Scenario mapping exercises highlighted a collective desire to move toward digital environments that support exploration and creativity without demanding constant adult mediation. The utopian visions participants created were not calls for removing digital play but for transforming it into spaces that echo the child-led, adaptive and imaginative qualities of traditional play while harnessing the potential of digital tools responsibly.

This synthesis positions digital play as a site of both tension and opportunity. On one hand, systemic pressures have reshaped play into a managed, commercialized experience that risks

distorting a child's relationship with freedom and imagination. On the other hand, the very visibility of these tensions surfaced through loops, horizons, and participatory insights offers leverage for rethinking design, policy and culture in ways that restore play to its rightful place as a child-centered, intrinsically meaningful activity. Section 6 operationalizes this trajectory using the Three Horizons framework moving from H1 to H3 and then deriving H2 by back-casting to specify where and how change should be pursued.

7.2 Intervention Opportunities: Leverage Points for Healthier Digital Play

The system analysis and participatory foresight exercises indicate that meaningful change in children's digital play will not come from domestic fixes alone. It requires shifts in platform incentives, design practice, and policy. The leverage points below prioritize actions that materially move the ecosystem from H1 toward H3 (Section 6), with a focus on five axes of change: agency, transparency, embodiment, community, and equity.

1. Moving Beyond Retention-Driven Design

Today, many children's games are optimized for attention rather than imagination. Points, streaks and microtransactions encourage repetition instead of exploration. From the child's perspective, this feels active they are tapping, collecting and returning but the core qualities that make play meaningful, like curiosity and self-expression, are often absent.

The first leverage point is to shift digital play design toward intrinsic engagement. Games that allow for narrative construction, open-ended creativity or flexible goals invite children to take ownership of their experience. This aligns with the workshop's utopian scenarios, where participants imagined digital spaces that encouraged exploration rather than extraction, echoing Sutton-Smith's (1997) notion of adaptive variability and Sicart's (2014) concept of play as personal and expressive.

2. Make Safety the Default, not an add-on

A recurring theme in both research and workshop discussions were the pressure on parents. Current digital ecosystems require them to act as full-time monitors setting timers, filtering content and negotiating usage because the system itself is not built for safety or developmental alignment.

The second leverage point is to create "safe-by-default" environments. If platforms embedded core protections and developmentally supportive features, parents could return to a lighter, more natural form of supervision more like watching from the balcony, as I experienced in my own childhood, rather than standing in the middle of the playground. This echoes recommendations from Radesky (2020) and UNICEF RITEC (2022), emphasizing that true safety comes from system design, not just parental vigilance.

3. Embed Child Voice in Design and Governance

Children are experts in their own play, yet they remain peripheral to decisions that shape digital environments. A *child-centered approach* positions designers to give voice to children and treat the child as experts, rather than a late-stage tester. Participation should begin early and proceed through creation not as an add-on at the end of the process so that children's insights can steer mechanics, systems, and community features from the outset (Feder, 2020; see also Druin, 1999).

Methodologically, this implies e*xploration-grounded, open-ended, experience-based and reflective* work that acknowledges multiple perspectives and moves beyond isolated tools toward an integrated approach (Feder, 2020). In digital game projects, these qualities translate into participatory briefs, co-creation of core loops and iterative decision-points where children's feedback can materially alter design direction.

In practice, it is recommended that participation be structured around a clear ethics frame, parental consent, renewable child assent at each session, transparent withdrawal options, and data-minimal practices (Graham, Powell, Taylor, Anderson, & Fitzgerald, 2013). In jurisdictions covered by the GDPR, Article 8 on parental authorization should be observed, and online service design should align with the UK Age-Appropriate Design Code by adopting plain-language notices and protective defaults (European Union, 2016; Information Commissioner's Office, 2020). For younger children, short cooperative-inquiry sessions using low-fidelity making (draw-and-tell, tangible kits) are recommended to surface language-independent insights that can be mapped to core game systems (onboarding, challenge pacing, reward visibility). For pre-adolescents, storyboard/comic prototyping and small-group playtests are recommended with an emphasis on authorship (e.g., rule-tweaking, world-building). For adolescents, rotating youth panels and moderated online sprints are suggested to support text-forward critique of live builds (Druin, 1999). Within the product, feedback channels should remain pre-moderated and in plain language; disclosures about risks, rewards, and data flows should be presented up front rather than buried in fine print (Information Commissioner's Office, 2020). Participation is considered meaningful only when resulting changes move at least one of the study's target axes agency, transparency, embodiment, community, equity toward the Horizon-3 state and align with child well-being outcomes (UNICEF Innocenti, 2022, 2024).

4. Aligning Policy and Industry Toward Well-Being

Current regulation COPPA, GDPR-K, and similar frameworks focus primarily on data and privacy, not the quality of the play experience. This leaves a systemic gap: a game can be "compliant" yet still be exploitative or developmentally shallow.

Another leverage point is to expand regulatory focus toward child well-being and design ethics. Incentivizing "healthy-by-default" certification, mandating transparency in reward systems, or supporting OECD and Grimes, Antle, Steeves and Coulter (2024)

recommendations would create industry pressure for structural change rather than surface-level fixes. Workshop dystopian scenarios filled with over-monetized, over-controlled futures underline how necessary this alignment is.

5. Reconnecting Digital Play with Social and Cultural Roots

Finally, the workshop revealed that participants' most joyful play memories were rarely solitary or screen-bound. They described running outdoors, inventing rules and improvising with peers. In contrast, digital play often isolates children physically and strips away sensory richness.

The last leverage point is to reconnect digital play with its social and cultural dimensions. Hybrid games that bridge online and offline experiences, encourage co-play or support local play cultures can restore the sense of shared, open-ended exploration that defines healthy play. Participants' vision of a "digital courtyard" a safe but liberating environment captures this aspiration perfectly.

Technological enablers (Hunter, 2023). Four signals operate as a practicable stack for these shifts: hybrid/mixed-reality play (embodiment), AI-assisted personalization for creativity (agency), collaborative digital storytelling (community and authorship), and local networked platforms that move children from consumption to production (equity and voice). These function as H3-enablers when they reduce reliance on parental policing and streak-based engagement while shifting one or more of the five axes in the right direction.

7.3 Design Principles for Healthy Digital Play

Building on Sections 3–6, these principles synthesize the literature, systems analysis, and workshop findings into brief guidance for designing digital play that is ethical, developmentally supportive, and aligned with the Horizon-3 vision. They assume shared responsibility across platforms, designers, policymakers, and allied actors.

Principles for Ethical and Safe Digital Play

1. Safe by Design

Safety should be embedded in the initial design of digital platforms, not added as an afterthought. This includes protecting children's data, ensuring age-appropriate content and avoiding manipulative interface patterns.

2. Transparent Systems

Platforms should openly communicate how they operate, including data collection, reward cycles and recommendation systems. Children and parents should be able to understand how decisions are made behind the interface.

3. Minimized Manipulation

Extrinsic reward loops, streaks and dark patterns that exploit attention should be reduced. Play should remain a space where children can make meaningful choices without persistent behavioral nudges.

4. Parental Guidance, Not Policing

Parents should act as light-touch guides like watching from a safe balcony rather than constant monitors. Platforms must support this supervisory role without forcing parents into continuous intervention.

5. Regulatory Alignment

Compliance with COPPA, GDPR-K, and UNICEF RITEC guidelines should extend beyond data protection to address play quality, developmental alignment and children's rights.

Principles for Supporting Authentic Play

6. Child Agency First

Digital play should respect the child's right to make choices, explore rules and direct their own experiences.

7. Open-Ended Exploration

Games should encourage discovery and experimentation, not reduce engagement to repetitive tasks or linear achievement paths.

8. Imagination and Storytelling

Play environments should support narrative creation, character building, and imaginative worlds, allowing children to construct meaning through play.

9. Social and Shared Play

Play is inherently social. Digital platforms should enable collaboration, shared creativity and a sense of community rather than isolated consumption.

10. Hybrid Physical-Digital Integration

Whenever possible, digital play should extend into the physical world, encouraging movement, sensory engagement and real-world exploration.

Taken together, these principles operationalize the preferred future articulated in Section 6: they priorities agency, make systems transparent, reconnect play with embodiment and community, and advance equity. They also provide clear criteria for evaluating Horizon-2 efforts and for directing system-level choices that restore play as an intrinsically meaningful activity.

Lasting progress depends on system-level choices designs and policies that respect children's agency and protect their space to imagine, create, and explore. These principles are open to

further development, but when taken seriously, they can help digital play begin to feel closer to the open, self-directed experiences we remember from our own childhoods.

8. Reflections and New Beginnings

8.1 Research Journey - What I Learned as a Researcher-designer

This project began with the recognition that play is not just a pastime but a formative element in shaping identity. I can connect some emotions I feel as an adult to games I played as a child. Whether we notice it or not, childhood play shapes who we are today. Seeing that play is something older than culture has also moved into the digital world and become part of a large industry made me want to explore what digital play means for children now.

The study is based on established theories but also comes from my own life, gaming memories, and observations of how childhood play environments have changed. Working with systems thinking, critical play theory and participatory design meant looking at play from two angles: analyzing patterns in the system and understanding it through human experiences.

I learned that researching digital games is not just about looking at the games themselves but also at the values, rules and power relations built into them. System tools helped me see how small design choices can affect wider behaviors and norms. The workshop also showed me that early play experiences digital or physical leave strong impressions that shape how people approach creativity, decision-making and relationships later in life.

8.2 Evolving Perspective on Digital Play

When I began this research, I saw the main challenge of digital play as finding ways to “fix” existing platforms and preserve traditional play values in digital environments. However, exploring the ambiguous nature of play strengthened my belief that play can adapt and flourish in any setting. With evolving technologies, I became more hopeful that the core values of play could also be realized in digital spaces.

Over time, my perspective became more layered. I came to understand that digital play is not inherently good or bad; it exists on a spectrum shaped by design choices, governance models and cultural context. Today's children are not simply "migrating" into digital environments, they are born into them. Digital play is therefore not an optional addition to childhood but a primary space where identity, relationships and imagination are formed.

Banning digital play overlooks this reality and risks deepening the disconnect between the world's children inhabit and adult expectations. The challenge, then, is to shape digital environments so they nurture the best qualities of play freedom, creativity and shared meaning while avoiding the manipulative and limiting structures that too often dominate.

8.3 Looking Forward: Future Directions

The findings from this project point to several important directions for future research, design and policy. First, there is a clear need for the digital games industry to adopt more inclusive and child-centered design practices approaches that recognize children not only as passive end users but as active co-creators, capable of contributing valuable ideas about their own play environments. This means moving beyond the notion of designing "for" children toward designing "with" children, where their perspectives and lived experiences actively shape design decisions. Such approaches could involve structured participatory design workshops, integration of child rights-based evaluation frameworks such as UNICEF's RITEC (2024) and ongoing feedback loops between children, developers, educators and parents.

Second, this research reinforces the need for stronger cross-sector collaboration. Meaningful change in digital play environments cannot be achieved by designers alone; it requires cooperation between policymakers, educators, psychologists, child rights advocates and the technology sector. Collaborative networks could work to set standards for healthy digital play, create open-access toolkits for ethical design and advocate for policies that align commercial incentives with children's developmental needs.

Third, there is a rich opportunity for exploring alternative economic and governance models for children's digital platforms. Many of the challenges identified in this research such as manipulative monetization cycles and algorithmic control are rooted in the prevailing commercial structures of the gaming industry. Future work could experiment with models that prioritize community well-being, shared ownership and long-term engagement over short-term profit.

Finally, building on the insights gained in this project, I intend to develop and prototype game concepts for both the near and distant future. These concepts will aim to integrate the core values of play freedom, creativity and shared meaning into digital environments, while actively addressing the systemic challenges identified in this study. Some of these designs may experiment with blending digital and physical play, others may focus on narrative-driven, open-ended worlds where children can negotiate and invent their own rules. In all cases, the goal will be to create spaces that honor children's agency, imagination and right to play in ways that are both developmentally supportive and future ready.

8.4 Concluding Reflections

This research has shown me that physical or digital play is a formative part of childhood, shaping identity, relationships and imagination. The challenge is not only to shield children from harmful aspects of digital play but to actively design environments that enable them to thrive.

Addressing these challenges requires looking beyond surface issues to the deeper systems that shape them commercial priorities, cultural attitudes and governance structures. Sustainable change depends on aligning thoughtful design, supportive policy and cultural shifts.

On a personal level, this project has deepened my appreciation for the adaptability of play. Even in restrictive environments, children find ways to tell stories, connect, and create

meaning. Yet the quality of those environments matters: when designed with care, digital spaces can expand a child's creative and social possibilities; when neglected, they can narrow them in limiting ways.

As I conclude this phase of the work, I see it not as a final statement but as a starting point. The insights gained will guide my future practice whether in designing games, shaping research or contributing to policy debates. My goal remains the same: to help create digital play environments that honor children's right to play, protect their well-being and inspire their imagination for the world they will inherit.

9. References

Aarseth, E. (1997). Cybertext: Perspectives on ergodic literature. London: Johns Hopkins University Press.

American Academy of Pediatrics. (2021). Media and children. https://www.aap.org/en/patient-care/media-and-children/

Bogost, I. (2006). Unit operations: An approach to videogame criticism. MIT Press. https://doi.org/10.7551/mitpress/6997.001.0001

Bogost, I. (2007). Persuasive games: The expressive power of videogames. MIT Press. https://doi.org/10.5860/choice.46-0096

Bruner, J. S. (1983). Child's talk: Learning to use language. Oxford University Press.

Candy, S., & Dunagan, J. (2017). Designing an experiential scenario: The people who vanished. Futures, 86, 136–153,

Caillois, R. (1958). Man, play and games (M. Barash, Trans.). Free Press.

Castillo, (2019). Unpacking The Loot Box: How Gaming's Latest Monetization System Flirts With Traditional Gambling Methods, 59 Santa Clara L. Rev. 165c https://digitalcommons.law.scu.edu/lawreview/vol59/iss1/5/

Cole, M. (1993). A cultural-historical approach to distributed cognition. In Distributed cognitions: Psychological and educational considerations (pp. 1–46). Cambridge University Press.

Cole, M., & Scribner, S. (1978). Mind in society: The development of higher psychological processes (L. S. Vygotsky, Ed.). Harvard University Press.

Consalvo, M. (2009). Cheating: Gaining advantage in videogames. MIT Press.

Consalvo, M. (2009). There is no magic circle. Games and Culture, 4(4), 408–417. https://doi.org/10.1177/1555412009343575

Costikyan, G. (2002). I have no words & I must design: Toward a critical vocabulary for games. In Proceedings of the Computer Games and Digital Cultures Conference. DiGRA Digital Library. https://doi.org/10.26503/dl.v2002i1.29

Deterding, S., & Bredow, H. (2011). Situated motivational affordances of game elements: A conceptual model. Hans Bredow Institute for Media Research.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. E. (2011). From game design elements to gamefulness: Defining "gamification." In Proceedings of the 15th International Academic MindTrek Conference (pp. 9–15). ACM. https://doi.org/10.1145/2181037.2181040

Duffy, S., & Derevensky, J. (2022). Helping parents understand the content of video games: updating the ESRB rating system. Journal of Children and Media, 16(4), 606–612. https://doi.org/10.1080/17482798.2022.2124696

Druin, A. (1999). Cooperative inquiry: Developing new technologies for children with children. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '99), 592–599. https://doi.org/10.1145/302979.303166

Erikson, E. H. (1951). Childhood and society. W. W. Norton & Company.

Ermi, L., & Mäyrä, F. (2005). Fundamental components of the gameplay experience: Analyzing immersion. DiGRA Conference Proceedings. https://doi.org/10.26503/dl.v2005i1.119

European Union. (2016). Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 (General Data Protection Regulation), Article 8: Conditions applicable to child's consent in relation to information society services. https://gdpr-info.eu/art-8-gdpr/

Feder, K. (2020). Exploring a Child-Centred Design Approach: From tools and methods to approach and mindset. https://adk.elsevierpure.com/en/publications/exploring-a-child-centred-design-approach-from-tools-and-methods-

Firth, S. (n.d.). What is graphic recording? Retrieved July 28, 2025, from https://www.sarahthefirth.com/graphic-recording

Flanagan, M. (2009). Critical play: Radical game design. MIT Press. https://maryflanagan.com/writing/critical-play/

Freud, S. (1955). The standard edition of the complete psychological works of Sigmund Freud (J. Strachey, Ed.). Hogarth Press. (Original work published 1908)

Fullerton, T. (2014). Game Design Workshop: A Playcentric Approach to Creating Innovative Games, Third Edition (3rd ed.). A K Peters/CRC Press. https://doi.org/10.1201/b16671

Fullerton, T. (2018). Game design workshop: A playcentric approach to creating innovative games (4th ed.). CRC Press. https://doi.org/10.1201/b22309

Graham, A., Powell, M., Taylor, N., Anderson, D., & Fitzgerald, R. (2013). Ethical research involving children. UNICEF Office of Research–Innocenti. https://www.unicef.org/innocenti/media/9181/file/Ethical-Research-Involving-Children-compendium-2013-EN.pdf

Garaigordobil, M., Berrueco, L., & Celume, M.-P. (2022). Developing children's creativity and social-emotional competencies through play: Summary of twenty years of findings of the evidence-based interventions "game program." Journal of Intelligence. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9590021/#B88-jintelligence-10-00077

Grimes, S. M. (2021). Digital playgrounds: The hidden politics of children's online play spaces, virtual worlds, and connected games. University of Toronto Press.

Grimes, S. M., Antle, A. N., Steeves, V., & Coulter, N. (2024). Responsible AI and children: Insights, implications, and best practices. CIFAR. https://cifar.ca/wp-content/uploads/2024/04/CIFAR-Responsible-AI-and-Children-EN_Final.pdf

Gosso, Y., & Almeida Carvalho, A. M. (2013). Play and cultural context. In R. E. Tremblay, M. Boivin, & R. DeV. Peters (Eds.), Encyclopedia on Early Childhood Development. Retrieved August 10, 2025, from https://www.child-encyclopedia.com/play/according-experts/play-and-cultural-context

Gottfried, J., & Sidoti, O. (2024). Teens and video games today. Pew Research Center. https://www.pewresearch.org/internet/2024/05/09/teens-and-video-games-today/

Hargraves, V. (2022). Digital technologies in early childhood education. The Education Hub. https://theeducationhub.org.nz/digital-technologies-in-early-childhood-education/

Hargraves, V. (2022). What is digital play?. The Education Hub. https://theeducationhub.org.nz/what-is-digital-play/

Harvey, A. (2021). Gaming the system: Deconstructing video game monetization. University of Minnesota Press.

Henricks, T. (2008). The Nature of Play. University of Illinois Press. https://www.museumofplay.org/app/uploads/2022/02/1-2-article-the-nature-of-play.pdf

Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2020). A new path to education reform: Playful learning promotes 21st-century skills in schools and beyond. https://www.brookings.edu/wp-content/uploads/2020/10/Big-Ideas_Hirsh-Pasek_PlayfulLearning.pdf

Huizinga, J. (1938). Homo ludens: A study of the play-element in culture. Routledge & Kegan Paul.

Hunter, L. (2023, November 10). What gaming could be. Farsight Copenhagen Institute for Futures Studies. https://farsight.cifs.dk/what-gaming-could-be/

Hunicke, R., LeBlanc, M., & Zubek, R. (2004, January). MDA: A formal approach to game design and game research. AAAI Workshop – Technical Report, 1. https://www.researchgate.net/publication/228884866_MDA_A_Formal_Approach_to_Game_Design_and_Game_Research

Information Commissioner's Office. (2020). Age appropriate design: A code of practice for online services (Children's Code). https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/childrens-information/childrens-code-guidance-and-resources/age-appropriate-design-a-code-of-practice-for-online-services/

Jones, P., & Ael, K. van. (2022). Design Journeys through Complex Systems: Practice Tools for Systemic Design (1. Auflage). BIS Publishers.

Juul, J. (2001). Games telling stories? A brief note on games and narratives. Game Studies, 1(1). https://www.gamestudies.org/0101/juul-gts/

Juul, J. (2005). Half-real: Video games between real rules and fictional worlds. MIT Press.

Leontiev, A. N. (1981). Problems of the development of the mind (M. Cole, Trans.). Progress Publishers. https://archive.org/details/leontyev-problems-of-the-development-of-the-mind-progress-1981

Linehan, C., Kirman, B., & Roche, B. (2015). Gamification as behavioral psychology. In S. P. Walz & S. Deterding (Eds.), The gameful world: Approaches, issues, applications (pp. 81–106). MIT Press. https://direct.mit.edu/books/edited-volume/3066/The-Gameful-WorldApproaches-Issues-Applications

Livingstone, S., & Pothong, K. (2022). Imaginative play in digital environments: designing social and creative opportunities for identity formation. Information, Communication & Society, 25(4), 485–501. https://doi.org/10.1080/1369118X.2022.2046128

Livingstone, S., Mascheroni, G., Dreier, M., Chaudron, S., & Lagae, K. (2015). How parents of young children manage digital devices at home: The role of income, education and parental style. London School of Economics. https://eprints.lse.ac.uk/63378/1/__lse.ac.uk_storage_LIBRARY_Secondary_libfile_shared_repository_Content_EU%20Kids%20Online_EU_Kids_Online_How%20parents%20manage%20digital%20devices_2016.pdf

Mäyrä, F. (2008). An introduction to game studies: Games in culture. SAGE Publications. https://doi.org/10.4135/9781446214572

McDonald, P. (2019, Winter). Homo Ludens: A renewed reading. American Journal of Play, 11(2), 245–268. The Strong National Museum of Play. https://www.museumofplay.org/app/uploads/2022/01/11-2-Article-5.pdf

McGonigal, J. (2011). Reality is broken: Why games make us better and how they can change the world. Penguin Press.

Merriam, S. B. (2009). Qualitative research: A guide to design and implementation. Jossey-Bass. https://download.e-bookshelf.de/download/0003/7195/84/L-G-0003719584-0007575839.pdf

Moll, L. C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. Theory Into Practice, 31(2), 132–141. https://doi.org/10.1080/00405849209543534

OECD (2023), AI and the Future of Skills, Volume 2: Methods for Evaluating AI Capabilities, Educational Research and Innovation, OECD Publishing, Paris, https://doi.org/10.1787/a9fe53cb-en.

OECD (2025), How's Life for Children in the Digital Age?, OECD Publishing, Paris, https://doi.org/10.1787/0854b900-en.

OECD, Recommendation of the Council on Children in the Digital Environment, OECD/LEGAL/0389, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0389

OpenIDEO. (2018). Early childhood innovation. Medium. https://medium.com/openideo-istanbul-chapter/early-childhood-innovation-3cf7359a96b9

Ofcom. (2025). Children and parents: Media use and attitudes report 2025. https://www.ofcom.org.uk/siteassets/resources/documents/research-and-data/media-literacy-research/children/childrens-media-use-and-attitudes-report-2025/childrens-media-literacy-report-2025.pdf

Pepall, C., & Reiff, J. (2017). Monetising play: Children's digital games and the design of the player experience. Children & Society, 31(4), 310–322.

Piaget, J. (1962). Play, dreams and imitation in childhood (C. Gattegno & F. M. Hodgson, Trans.). W. W. Norton & Company.

Putnam, R. T., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? Educational Researcher, 29(1), 4–15. https://doi.org/10.3102/0013189X029001004

Radesky, J. S. (2020). Advocating for a child-centered digital environment. ZERO TO THREE Journal, 41(2), 5–12. https://www.zerotothree.org/resource/journal/advocating-for-a-child-centered-digital-environment/

Raessens, J. (2006). Playful identities, or the ludification of culture. Games and Culture, 1(1), 52–57. https://doi.org/10.1177/1555412005281779

Radoff, J. (2010, May 24). History of social games. Jon Radoff's Internet Wonderland. https://web.archive.org/web/20100527090108/http://radoff.com/blog/2010/05/24/history-social-games/

Rogoff, B. (1990). Apprenticeship in thinking: Cognitive development in social context. Oxford University Press. https://doi.org/10.1093/oso/9780195059731.001.0001

Roschelle, J. (1992). Learning by Collaborating: Convergent Conceptual Change. Journal of the Learning Sciences, 2(3), 235–276. https://doi.org/10.1207/s15327809jls0203_1

Ryan, R. M., Rigby, C. S., & Przybylski, A. K. (2006). The motivational pull of video games: A self-determination theory approach. Motivation and Emotion, 30(4), 344–360. https://doi.org/10.1007/s11031-006-9051-8

Salen, K., & Zimmerman, E. (2003). Rules of play: Game design fundamentals. MIT Press.

Scardamalia, M., & Bereiter, C. (1991). Higher levels of agency for children in knowledge building: A challenge for the design of new knowledge media. The Journal of the Learning Sciences, 1(1), 37–68. https://doi.org/10.1207/s15327809jls0101_3

Sicart, M. (2014). Play matters. MIT Press. https://doi.org/10.5860/choice.187526

Schmid, J., Unternaehrer, E., Benecchi, E., Bernath, J., Bolten, M., Burkhardt Bossi, C. B., Iskrzycki, K., Mazzoni, P., Steiner, O., Sticca, F., & Dimitrova, N. (2025). Digital media use in 0–5-year-old children in Switzerland. Swiss Psychology Open, 5(1), Article 4. https://doi.org/10.5334/spo.89

Sutapa, P., Pratama, K. W., Rosly, M. M., Ali, S. K. S., & Karakauki, M. (2021). Improving Motor Skills in Early Childhood through Goal-Oriented Play Activity. Children (Basel, Switzerland), 8(11), 994. https://doi.org/10.3390/children8110994

SUITS, B. (1978). The Grasshopper: Games, Life and Utopia. University of Toronto Press. http://www.jstor.org/stable/10.3138/j.ctvcj2w4h

Sutton-Smith, B. (1997). The ambiguity of play. Harvard University Press.

The Economist. (2023, March 24). The future of video games [Video]. The Economist. https://www.economist.com/films/2023/03/24/the-future-of-video-games

United Nations Children's Fund (UNICEF). (2021). The State of the World's Children 2021: On my mind—Promoting, protecting and caring for children's mental health. UNICEF. https://www.unicef.org/reports/state-worlds-children-2021

UNICEF Innocenti – Global Office of Research and Foresight. (2025). Childhood in a digital world: Screen time, digital skills and mental health. UNICEF Innocenti. https://www.unicef.org/innocenti/reports/childhood-digital-world

UNICEF Innocenti – Global Office of Research and Foresight. (2024, April). Responsible innovation in technology for children: Digital technology, play and child well-being [Phase 2 report]. https://www.unicef.org/innocenti/media/8056/file/UNICEF-Innocenti-RITEC-P2-report-2024.pdf

UNICEF Office of Research – Innocenti. (2022). Responsible innovation in technology for children: Digital technology, play and child well-being. https://www.unicef.org/innocenti/media/4681/file/UNICEF-RITEC-Digital-technology-play-child-wellbeing-2022.pdf

Vygotsky, L. S. (1962). Thought and language (E. Hanfmann & G. Vakar, Trans.). MIT Press.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). Harvard University Press.

Xiao, L., & Newall, P. W. S. (2021). Smart regulation of loot boxes: A public health framework. Addiction, 116(6), 1193–1195. https://doi.org/10.1111/add.15252

Zagal, J.P., Björk, S., & Lewis, C. (2013). Dark patterns in the design of games. International Conference on Foundations of Digital Games.

10. Appendices

A. Workshop Structure and Prompts

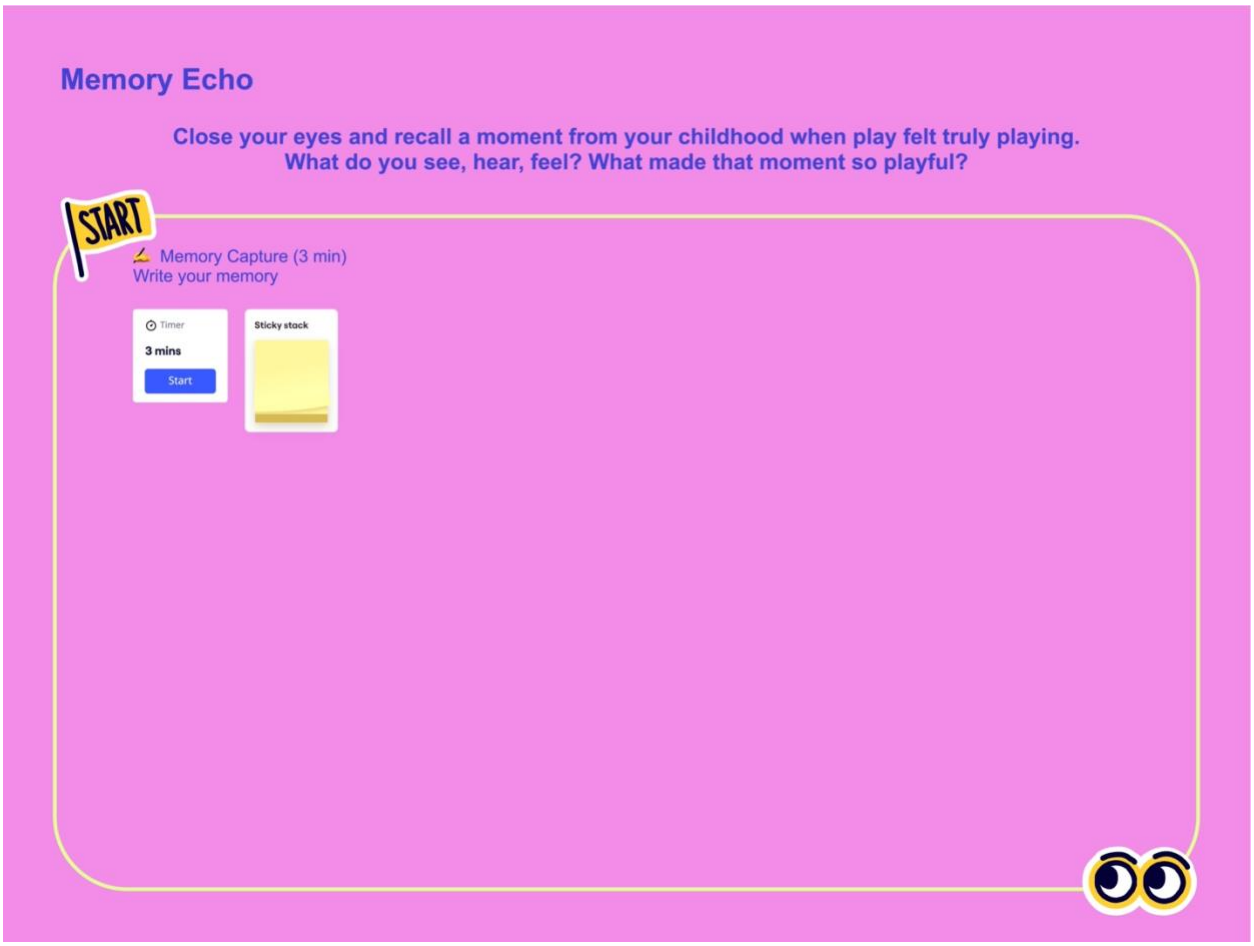

Figure A 1. Memory Echo – recall exercise board.

Warm-up activity inviting participants to capture a vivid childhood play memory.

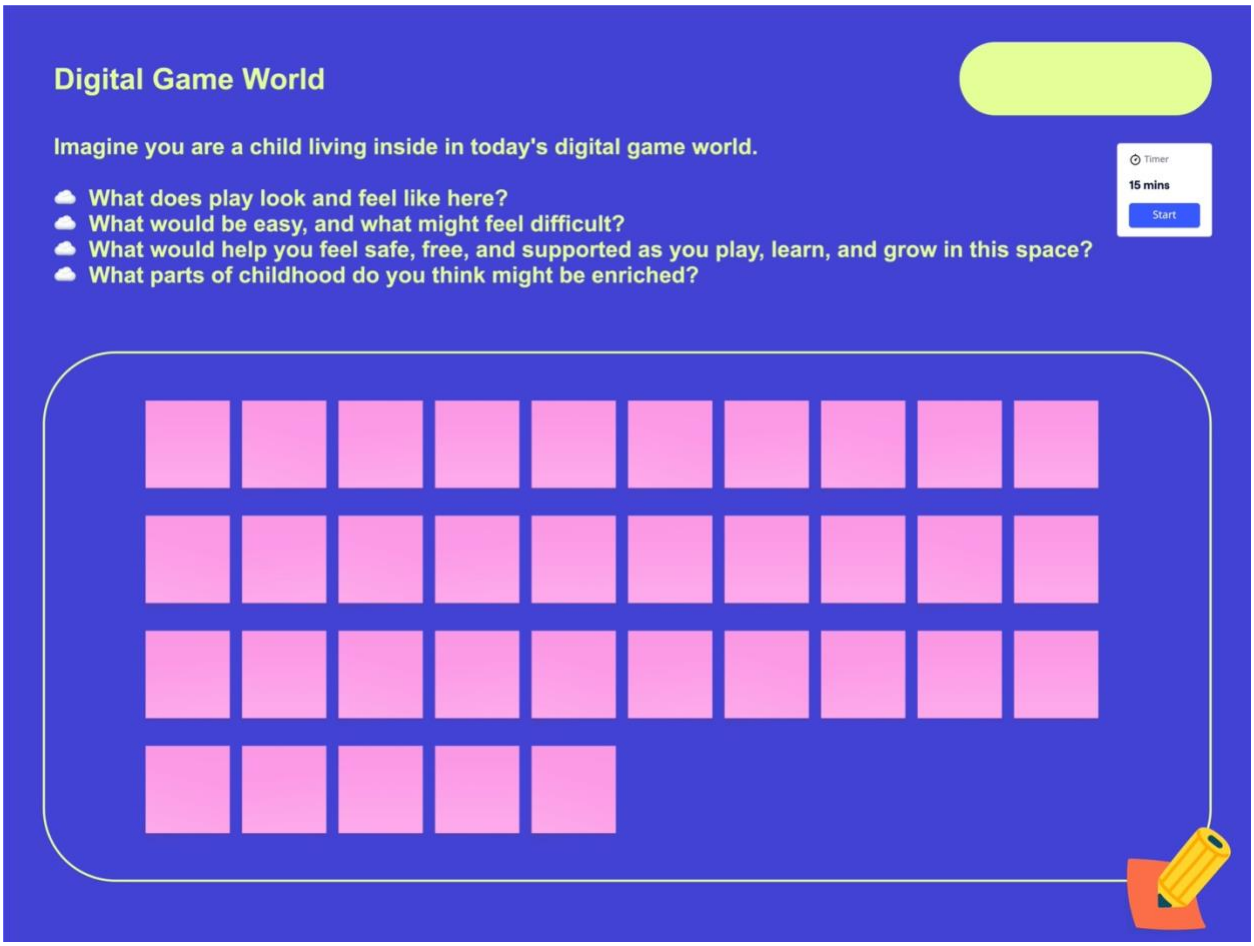

Figure A 2. Digital Game World – prompt board.

Participants imagine being a child inside today's digital game world; guiding questions solicit ease difficulty, safety freedom and enriched aspects of childhood.

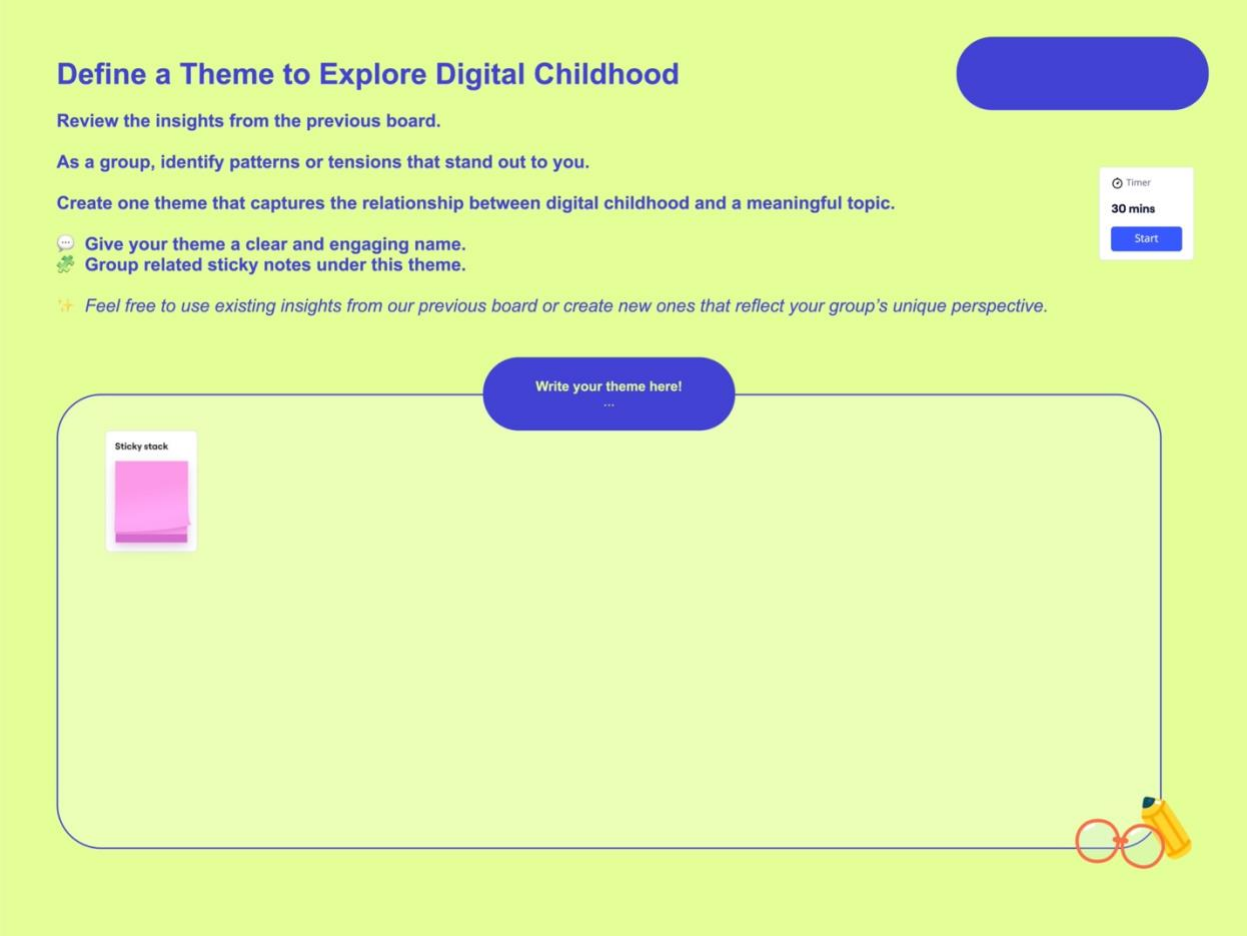

Figure A 3. Define a Theme – clustering & naming board.

Teams review prior insights, group related stickies and coin a clear theme title to frame subsequent mapping.

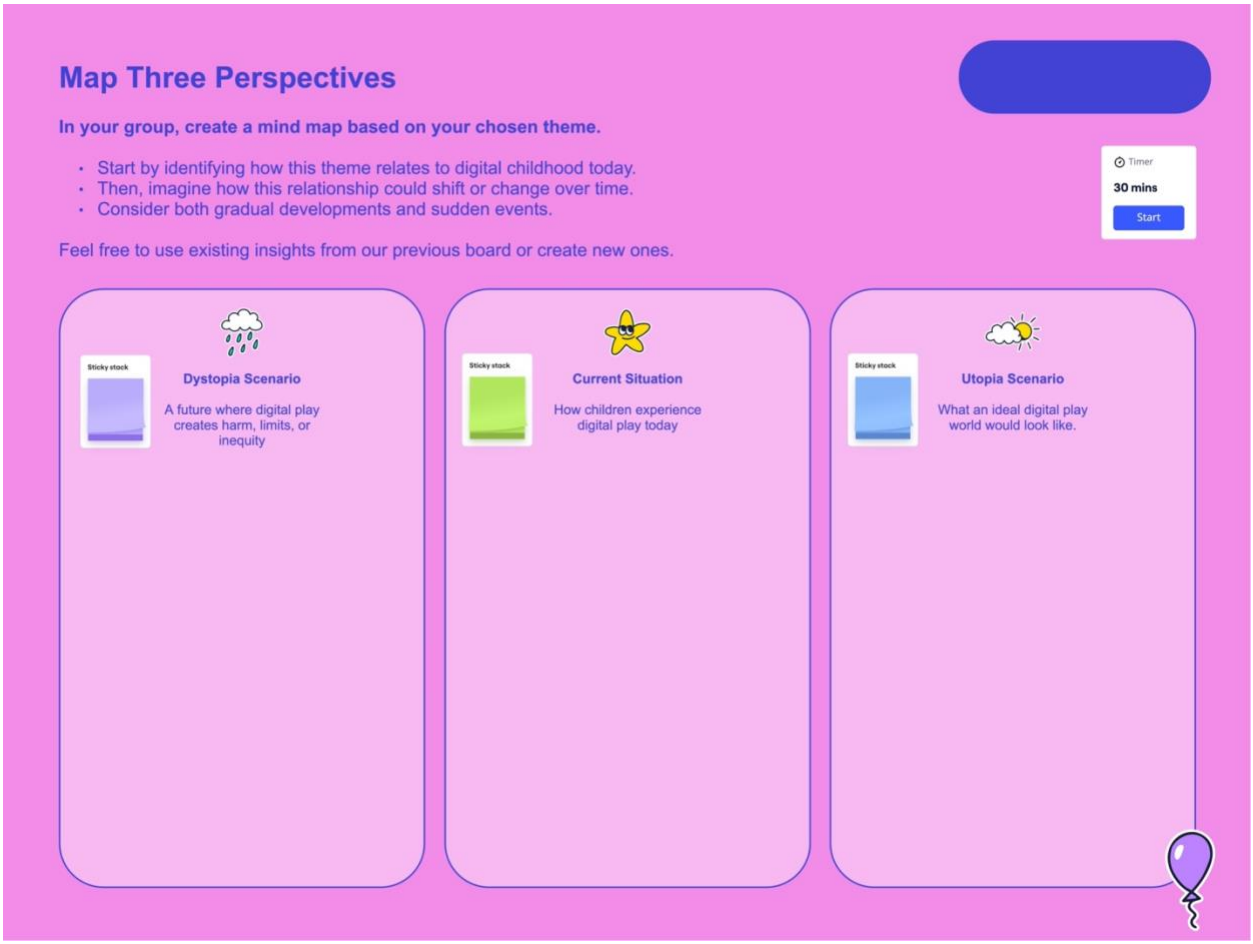

Figure A 4. Map Three Perspectives – dystopia/current/utopia mind map.

Tri-panel canvas for envisioning a dystopian trajectory, documenting the current situation and outlining a preferred (utopian) scenario.

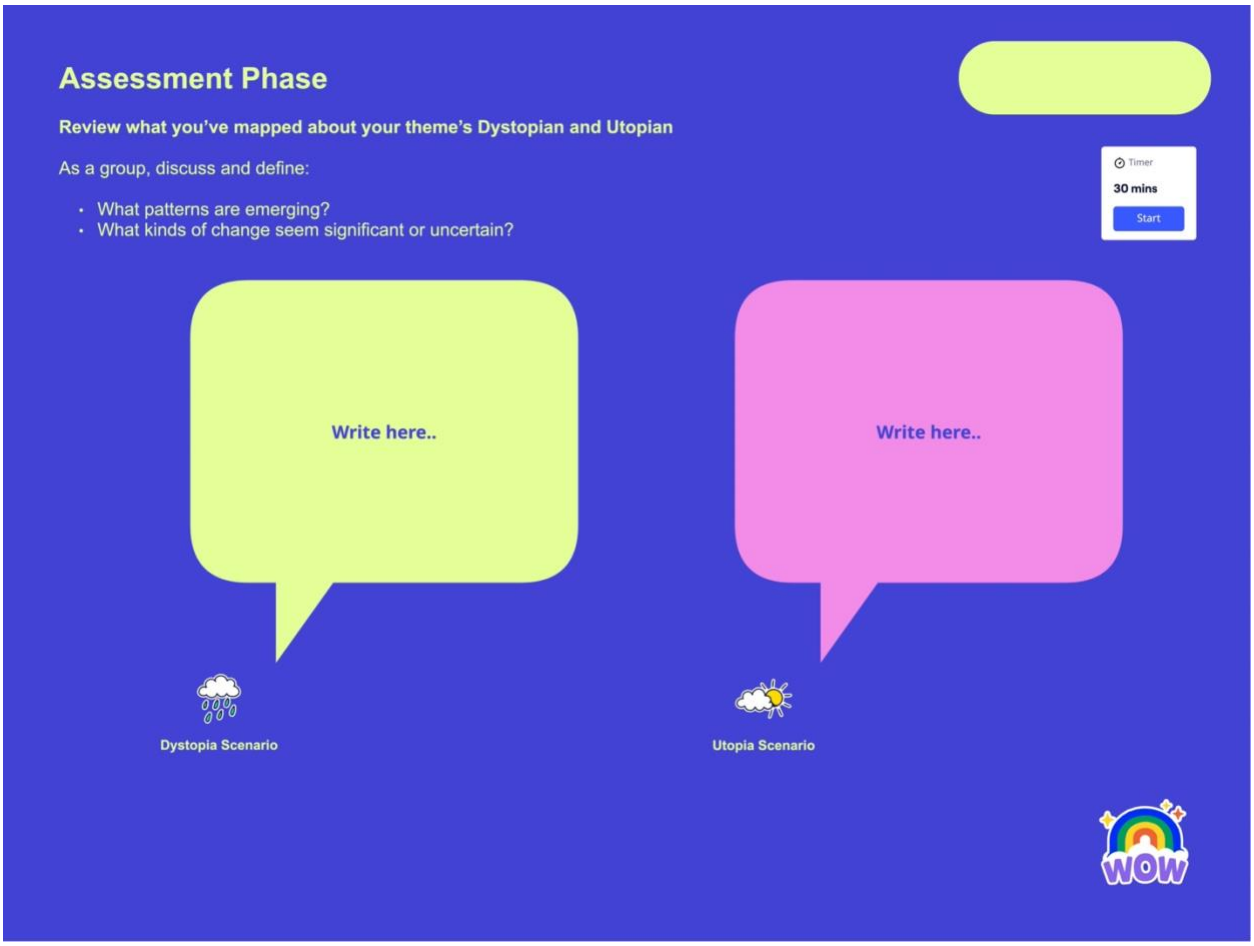

Figure A 5. Assessment Phase – pattern & uncertainty review board.

Structured reflection to identify emerging patterns and significant uncertain changes; left bubble for dystopia synthesis, right bubble for utopia synthesis.

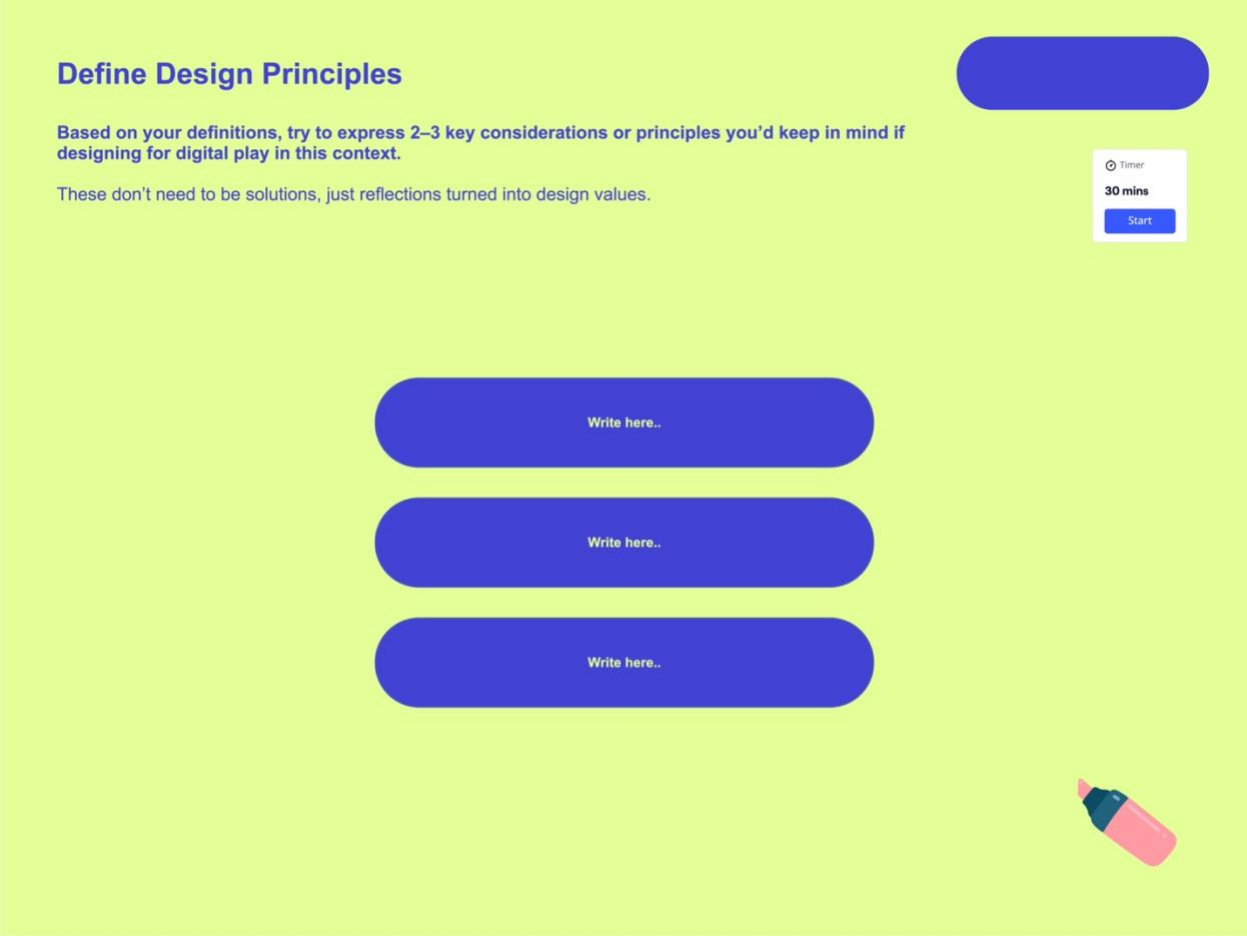

Figure A 6. Define Design Principles – principles drafting board.

Conversion of insights into 2–3 concise design principles to guide future digital play concepts.

B. Visual Artifacts and Workshop Outputs

Figure B 1. Workshop recruitment poster.

Public call for participation used for the study.

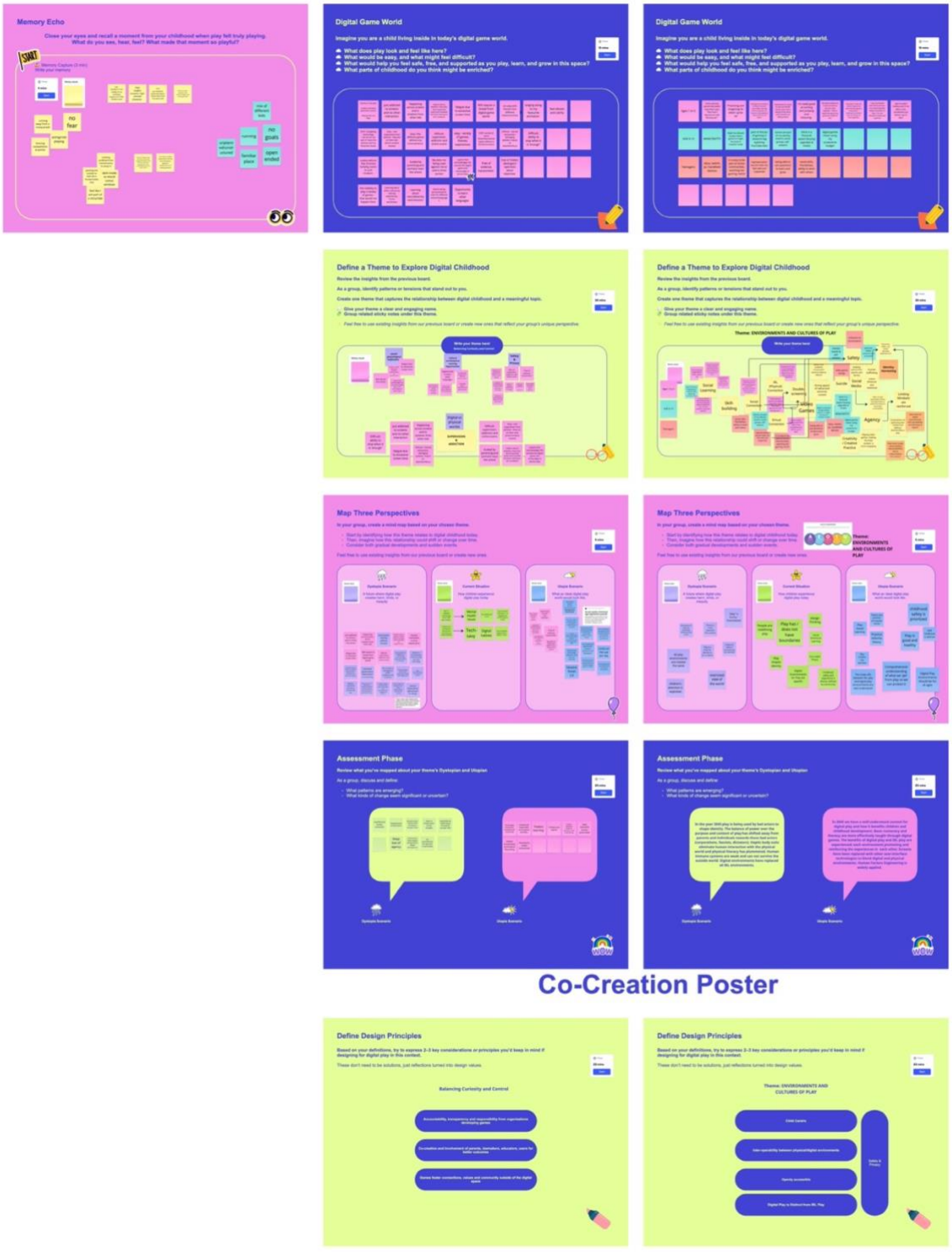

Figure B 2. Participant-Generated Outputs.

Screenshots of anonymized Miro boards created by participants during the workshop. The composite shows the full flow: *Memory Echo* (recall exercise), *Digital Game World*, *Define a Theme*, *Map Three Perspectives* (dystopia/current/utopia), *Assessment Phase* (patterns and uncertainties) and *Define Design Principles* (draft principles). Prompts/timers were provided by the researcher; all sticky-notes and content were entered live by participants.