Generative AI in Children's Creative Collaboration: Impact, Perception, and Design Guidelines

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Figure 1: Collaboration between children and parents with GenAI. A creation made by children (left) is input into GenAI (middle), which can either support or hinder collaboration, leading to a co-created output (right).

Abstract

The advent of Generative AI (GenAI) has raised discussions about its effects on individuals. However, little is known about its impact on children's creative collaboration, despite its importance for social and cognitive development. We examined GenAI's role in children's creative collaboration through five co-design sessions with 28 children (ages 5-11) using diverse GenAI tools (text, image, video, voice); 17 parents participated in focus group interviews. Our findings show that GenAI can foster positive social dynamics by enabling "Human vs. AI" teaming and children's co-creation with shared ownership. However, GenAI disrupted collaborations when roles between children were unclear, AI ignored group dialogue, and AI dominated children's agency. Children and parents envisioned socially attuned AI that could play an "older sibling" role–scaffolding while allowing playful disagreement–while raising concerns about children's overreliance on GenAI. This work advances understanding of GenAI in collaboration and proposes design implications for designing AI systems that support child-centered collaboration.

CCS Concepts

• **Human-centered computing** → **Collaborative and social computing**.

Keywords

Generative AI, collaboration, children, creativity, human-AI interaction, participatory design, co-design

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1 Introduction

Collaboration is central to children's cognitive and social development and forms a large part of their educational experience [53, 114]. This process supports the development of social skills, self-esteem, and critical thinking [68, 76, 114]. Creative collaboration—the process of jointly generating and transforming ideas—enables children to build shared understandings and inspire one another [8, 113, 125]. At the same time, collaboration among children is not easy. Children may struggle to explain their reasoning, ask for help, or offer constructive feedback, and even existing friendship dynamics can hinder group work [52, 77, 94].

Recently, researchers have begun examining how children use generative AI (GenAI) in their creative collaborations, such as co-creating stories with peers using GenAI [31, 33, 88]. GenAI systems learn patterns from large-scale data to generate text, images, and video, enabling new forms of idea integration and collaborative support [1, 70, 90]. With the ability to produce instant and diverse content, GenAI may support children's collaboration in ways traditional media or adults cannot. However, GenAI may also pose risks for children's collaboration compared to non-generative media such as e-books and online videos. GenAI's content generation can shift the group's attention toward prompt refinement [57], constrain learning agency [101], and diminish human connection [111]. Moreover, its human-like language and behavior may foster anthropomorphism [15, 82]. In such cases, GenAI may override collaborative processes by encouraging children's overreliance on AI and constraining their creative exploration [88, 147].

These divergent possibilities raise important questions: ***What roles does GenAI play in mediating children's creative collaborations? What kinds of roles are best for supporting children's collaborations?*** Addressing these questions is crucial before introducing GenAI into children's collaborative activities, since technologies in multi-party contexts can influence relationships in both positive and negative ways [41, 142]. While prior studies have explored how children use GenAI for learning [6, 38] and creative output [2, 31, 56, 145], they have primarily focused on *what children produce with GenAI* and *how they perceive its outcomes*. In contrast, less attention has been paid to *how GenAI shapes the collaborative process itself* –specifically, how GenAI mediates social dynamics, influences children's agency, and *what children envision GenAI's role* to be in their peer collaborations. This is a critical gap, as the process of collaboration is as valuable as the final product [67, 76, 124].

In this paper, we address this gap by investigating how GenAI mediates children's creative collaboration through the theoretical lens of Joint Media Engagement (JME) [123]. While prior JME research has explained how children engage with traditional digital media alongside peers, siblings, or parents [60, 83, 115, 143], studies have not yet explored responsive and co-creative technologies such as GenAI. Unlike passive media, such as television or e-books, GenAI actively generates content that adapts to users' input in real time [1, 88], which may influence children's social dynamics in ways that differ from previous digital media. By utilizing JME in this new context, we provide structured insights into GenAI's impact on children's creative collaborations and identify the AI roles that best sustain these processes among children. Our study is guided by the following research questions:

- **RQ1:** How does GenAI support or hinder children's creative collaboration among peers?
- **RQ2:** What are children's and parents' perceptions of using GenAI in children's creative collaboration?

We conducted five participatory design (PD) sessions with 28 children (ages 5–11); including one family co-design session that included parents, followed by group interviews with 17 parents. Parents' perspectives add a viewpoint on GenAI's role in children's peer collaborations from those who care about healthy social interactions with friends and technology. We chose the PD method of Cooperative Inquiry [40, 140] to: (1) closely observe the natural flow of collaboration, (2) gather in-the-moment feedback, (3) identify social dynamics among children and GenAI, and (4) demonstrate how children's interactions and perceptions of GenAI evolved through repeated use over time. In our study, children collaborated in groups using several GenAI platforms (ChatGPT, Stable Diffusion, MidJourney, InVideo AI) across text, image, voice, and video modalities. They created fictional stories and science posters, chose when to use GenAI, and discussed their concerns and expectations for its role in collaboration. Our analysis identified three key findings:

- *AI as a Social Bonding Agent:* Children sometimes formed playful *"Human vs. AI" teams*, teaming up against the AI in ways that shifted their focus from individual ownership (*"mine"*) to shared collaboration (*"ours"*).
- *AI as a Social Barrier:* AI hindered collaboration when roles among children were unclear, when it failed to capture the flow of group dialogue, or when it dominated interactions by limiting children's agency.
- *Expected "Older Sibling" Role of AI:* Children and parents envisioned a socially attuned AI that supports group dynamics through authentic communication and invites playful disagreement, but they did not want AI involved in every stage of the collaborative process due to concerns about overreliance and reduced agency.

This research contributes to emerging HCI work on how GenAI can support creative collaboration. We contribute: (1) empirical evidence on how multiple children interact with diverse forms of GenAI (image, voice, text, video) and how children and parents perceive its potential, risks, and trade-offs in creative collaboration; (2) future directions for Joint Media Engagement research in the context of collaboration involving GenAI [123]; and (3) design implications for positioning GenAI as a flexible partner that supports rather than undermines children's collaboration with peers. While our study centers on children, these insights may inspire future explorations of GenAI in multi-human collaboration across age groups, pointing toward socially meaningful human–AI partnerships.

2 Related Work

2.1 Collaboration and Creativity in Children

Collaboration provides both social and cognitive benefits for children, helping them develop social skills, self-esteem, and critical thinking [68, 76, 114]. Children who engage in collaborative problem solving tend to achieve better learning outcomes compared to those who work individually [9, 118]. Barron et al. identified that the success of joint problem-solving is influenced by the responsiveness of group members when discussing, accepting, or rejecting proposals [10]. Creative collaboration, in particular, enables children to develop shared ways of thinking and expression [113, 125], and helps them co-construct knowledge and foster a sense of togetherness [67]. These processes are also shaped by children's existing friendships, which influence their mutual engagement and the quality of creative outcomes [84].

However, lack of collaborative skills, such as difficulty providing explanations or asking for help, can hinder children's collaboration and limit group success [52, 94]. Interestingly, close friendships between children can act as a barrier; when children are too familiar with one another, they may avoid critique, reducing the quality of collaboration [77].

Generative AI may contribute in these contexts, as its responsiveness, ability to transform ideas from multiple children, and human-like language generation can offer new forms of support [1, 70, 90]. At the same time, it also holds the potential to constrain learner agency or diminish human connection [101, 111], and its simulation of human-like behavior can at times feel creepy or disruptive [5], potentially interfering with natural interaction. This study therefore investigates the dual potential of GenAI in children's creative collaboration, both its opportunities and limitations.

2.2 GenAI in Human Collaboration

Generative AI (GenAI) is a distinct technological development that can synthesize text, images, and other inputs to generate novel content [1, 70]. It can also simulate aspects of human behavior in ways that may appear believable to users [90]. With turn-taking dialogue and human-like language, large language models (LLMs) may even be perceived as agents capable of adopting multiple social roles [110]. Due to these capabilities, Human-AI co-creation has been widely studied in individual domains such as drawing [42, 80, 89, 134], creative writing [30, 35, 51, 71], music composition [45, 61], and data presentation [79, 128]. In the context of children, prior work has examined how GenAI can prompt contextually relevant questions to scaffold creativity [2, 62]. To further support children's learning and creativity through storytelling, HCI researchers have developed AI agents [27, 56]. For example, StoryDrawer [145] and StoryPrompt [44] are AI-powered systems that assist children in story creation. To better understand GenAI's interaction style, Chin et al. [29] compared child–AI and child–parent collaborations in creative storytelling, identifying potential roles GenAI might play in supporting children's creative processes.

Beyond individual-AI interaction, growing attention has been paid to how GenAI may support human–human collaboration [58, 108, 127]. In multi-human creative settings, open questions remain about whether GenAI can foster creative collaboration and how people perceive its role [7]. For example, in the context of collaborative storytelling, a GPT-powered asynchronous co-writing platform encouraged role play and curiosity among participants [109]. In music co-creation, GenAI shaped social dynamics by shifting participant roles and influencing confidence [122]. However, in the context of paired design, participants viewed GenAI not as a true collaborator, but as a helpful tool [57].

HCI research on children's collaborative use of GenAI is still emerging. Existing studies primarily examine how GenAI supports creativity or learning *within* collaborative contexts [81, 88], rather than treating the *collaborative process itself* as the central focus. For example, prior work suggests that GenAI can heighten excitement and engagement through image generation and turn-taking, allowing children to build on AI-generated content [31, 145]. AI-powered storytelling systems have also supported co-creation between children or with parents [43, 148], offering insights into how GenAI facilitates creative expression.

While prior work has shown how GenAI can be used in collaborative activities to enhance creative outcomes, less is known about how it actively mediates the collaborative process itself—particularly the social and relational dynamics between children. Some studies highlight how GenAI tools can support parent–child relationships through joint story creation and related communication [132, 146], but little research examines how GenAI's affordances may disrupt or reshape peer (child–child) dynamics, or how children envision future creativity tools designed for group use.

2.3 Joint Media Engagement & AI

In child–computer interaction, collaboration around technology has been examined through the lens of Joint Media Engagement (JME), which refers to how multiple people use media together, including smartphones, robots, and digital games [142]. Takeuchi and Stevens identified conditions for productive JME that foster deeper understanding, inspiration, and well-being among children and adults: mutual engagement, dialogic inquiry, co-creation, boundary crossing, an intention to develop, and a focus on content rather than control [123]. Shared media usage can foster family bonding in everyday contexts [115], support collaborative learning [11, 38, 91], and facilitate collaborative problem solving [37, 92]. Within these interactions, parental roles and media contexts shape the relational dynamics [49, 60, 141]. For example, parents often co-created with children, but shift into spectator roles when children resisted sharing tablets during activities [14]. Cultural differences also play a role, as U.S. parents more often acted as spectators or coaches in instructional games, while Asian parents tended to take on more teammate roles [136].

Beyond families, JME among peers shows promise for advancing collaborative learning and development [46, 93]. Children who engaged with videos and games alongside siblings demonstrated stronger executive function development than those who played alone [24]. Technologies have also been developed to support inclusive peer learning, such as Incloodle, which enabled neurodiverse children's participation in kindergarten classrooms [116], and ChromaConnect, which facilitated social play among neurodiverse children [87]. Despite this promise, challenges persist, including asymmetrical relations among participants and difficulties scaling

beyond interactions between a single child and media [123]. To address these barriers, prior work points to frameworks for positive group interaction [107, 117] and design strategies that enable affective scaffolding [83].

With the advancement of AI technologies, HCI researchers have explored how AI systems are integrated into children's individual activities and child–parent interactions [29, 133]. For example, conversational agents that adapt to content and dialogue have been studied as learning companions, valued for their ability to simulate human-like communication and provide intelligent support [50, 54, 104]. In these contexts, parental mediation is often needed to repair communication breakdowns, such as misunderstandings between children and AI, and to sustain engagement [13, 38].

Recently, GenAI has introduced new possibilities for personalized, multimodal content creation (e.g., text, images, video)[1, 70], potentially transforming how children co-create and interact with media[129]. However, how these features influence children's collaboration remains underexplored. Prior JME studies have provided valuable insights into patterns of media use with relatively passive forms, such as video content [98], co-reading and story sharing with programmed storytelling devices [16], and collaborative drawing on tablets [14, 144]. In contrast, GenAI offers a more active and adaptive presence, raising new questions about how it supports or disrupts children's creative collaboration. As existing AI tools reveal limitations and call for more child-centered design [66], our study explores how GenAI shapes children's peer-to-peer creative collaboration, with attention to how and when it should intervene in the process.

3 Methods

3.1 Participatory Design & Focus Group Interview

For this study, we employed two complementary methods: a participatory design (PD) approach called Cooperative Inquiry (CI) [40, 140] and focus group interviews (FGI) [86]. Using CI alongside FGI enabled us to gain a deeper understanding of how children and parents interact with GenAI in collaborative settings, as well as how they perceive its possibilities, limitations, and ideal roles. Since the primary focus of this study is collaboration among peers, parents participated only in Design Session 4 (DS4) and the FGI to offer perspectives on the appropriateness and risks of GenAI for children working together, rather than to examine parent–child JME.

Cooperative Inquiry (CI). CI brings children and adults together as design partners to understand their contexts and envision future possibilities. This method is effective for examining peer-to-peer and relationship-based interactions as they develop over time. In our study, adult facilitators and parents took multiple roles (e.g., co-design partners and technology interpreters), which helped contextualize children's behaviors and added depth to our interpretations [140]. CI has been shown to enable children to express complex and abstract ideas and provide concrete feedback to improve technologies across a variety of topics [40, 65, 99]. It has been particularly valuable for studying children's behaviors and perceptions in the context of creativity and collaboration [3, 31, 63, 88, 96]. According to Druin's framework, children are considered design partners whose roles include users, testers, informants, and design partners [39, 40]. Accordingly, our co-design activities involved understanding GenAI, testing the tool, and designing artifacts that reflected children's envisioned future GenAI for collaborative support. In this study, CI allowed us to observe the natural flow of collaboration among peers and GenAI over time, while also collecting in-the-moment feedback from children's creative outputs and reflections during activities. Gathering data across multiple sessions helped us examine how children used GenAI in both similar and different contexts, and how their perceptions evolved as their familiarity with GenAI developed.

Focus Group Interview. Focus group interviews gather participants who share similar socio-demographic characteristics or lived experiences, creating a comfortable environment for discussion [75]. The interactive nature of focus groups not only elicits richer, more nuanced data but also highlights similarities and differences in participants' perspectives on a shared topic [86, 97]. We conducted interviews with parents immediately after they used GenAI with their children and other families, ensuring shared, concrete experiences for reflection, whether from identical tasks (same group) or contrasting cases (different groups). Comparing these interpretations allowed us to capture a broad spectrum of viewpoints on GenAI in children's collaborative creation.

3.2 Participants

We conducted our study with an established co-design group at our university, which included adult design team members (investigators and graduate and undergraduate research assistants), 28 child participants, and 17 parents. The study took place in an urban area of the United States. Nineteen child participants were members of an ongoing university co-design group and were therefore familiar with one another and with digital technologies, whereas DS4 included nine new children and parents who had not previously participated in the group. Child and adult (parent) demographics are shown in Table 1, and all children's names have been replaced with pseudonyms for confidentiality. Adults are referenced as "[child's pseudonym]'s [relationship]" to indicate their relationship to the child. Between February and April 2025, we conducted five participatory design sessions with children. Each session involved an average of 12 children, except DS4, which included 14 children and 17 parents. Participants were recruited through mailing lists, school social network groups, posters, and snowball sampling. The study was conducted with parental consent and child assent from all participants and was approved by our university's Institutional Review Board.

3.3 Design Sessions

We conducted four 90-minute child-to-child co-design sessions and one 120-minute family co-design session. All sessions were conducted in person in a university meeting room. We conducted only one family co-design session, as our primary goal was to examine how GenAI shaped peer-to-peer collaboration among children, with a secondary aim of exploring parents' perceptions and expectations. Each session included a 15-minute snack break, a 15-minute circle time for warm-up activities and introduction, a 45–75 minute group design period in which children co-designed with adult facilitators in 4–5 groups, and a 15-minute group discussion where teams

Table 1: Demographics of Child and Adult Participants

Pseudonym	Age	Gender	Ethnicity	Sessions	Pseudonym	Age	Gender	Ethnicity	Sessions
Aiden	6	M	White	DS4	Kinsley	9	F	Unknown	DS4
Amaya	6	F	Asian/Black	DS1, DS2, DS3, DS5	Madison	9	F	Asian/White	DS5
Anthony	11	M	Hispanic/Latino	DS1, DS3, DS5	Maya	6	F	Asian/White	DS1, DS2, DS3, DS4
Aria	6	F	Hispanic/Latino	DS1, DS3, DS5	Neel	10	M	Asian	DS1
Ariana	8	F	Asian	DS2, DS3, DS4, DS5	Owen	8	M	White	DS4
Ava	11	F	Asian/White	DS1, DS2, DS3, DS5	Parker	8	M	White	DS4
Brody	7	M	White	DS4	Ryan	7	M	Asian/White	DS1, DS2, DS3, DS4
Carter	9	M	Asian	DS4	Sam	6	M	White	DS4
Chloe	10	F	White	DS1, DS2, DS4	Sophia	10	F	Asian/Black	DS2
Daniel	8	M	Asian	DS5	Theo	5	M	Asian/White	DS5
Grace	9	F	Asian/White	DS5	Uriah	8	M	White	DS1, DS2, DS3
Jameson	6	M	White	DS4	Violet	10	F	Black/White	DS1, DS3, DS5
Julia	9	F	Asian/White	DS4	Willow	6	F	Asian/Black	DS2, DS3
Kai	10	M	Asian/Black	DS2, DS3, DS5	William	10	M	White	DS4, DS5

Relationship	Child	Gender	Ethnicity	Relationship	Child	Gender	Ethnicity
Mother	Aiden	F	White	Mother	Kinsley	F	Asian
Mother	Aiden	F	White	Mother	Owen	F	White
Mother	Ariana	F	Asian	Mother	Parker	F	White
Mother	Brody	F	White	Mother	Ryan, Maya	F	Asian
Father	Brody	M	White	Grandfather	Ryan, Maya	M	Asian
Father	Chloe	M	White	Grandmother	Ryan, Maya	F	Asian
Mother	Carter	F	Asian	Mother	Sam, Jameson	F	White
Mother	Julia	F	Asian	Mother	William	F	White
Father	Julia	M	White				

Top: Child participants. Bottom: Adult participants (all adults joined only DS4). Most children regularly attended our ongoing co-design group and were familiar with one another, whereas children who joined only DS4 were newly recruited and did not know each other beforehand.

presented their final artifacts and reflected on the process. Each group comprised 2–3 children and 2–3 adult facilitators, with 16–20 participants per session to support balanced contributions [140]. Facilitators were trained to help children feel comfortable expressing ideas and collaborating with peers, while avoiding dependence on adults. In our design sessions, children engaged in creative activities using diverse GenAI tools, including ChatGPT-4o[1], Stable Diffusion 3.5[2], Midjourney V7[3], and InVideo AI[4]. For more details on session protocols and sample prompts used with GenAI tools, please refer to Appendix A.

3.3.1 Design Session 1 (DS1): Collaboration without Using AI, February 2025. This session examined how children collaborate without GenAI, the challenges they face, and the support they desire. Children worked in groups to create a story using *Story Cubes*[5] without AI assistance, while adult facilitators supported collaboration and documented observed difficulties. During reflection time, facilitators shared the difficulties they observed and asked children to agree, disagree, or add new challenges or ideas. The session concluded by asking children how GenAI could assist in future collaboration, across creation, social interaction, and visualization.

3.3.2 Design Session 2 (DS2): Collaboration with Diverse AI Tools, February 2025. This session explored children's perceptions of multisensory GenAI tools (text-to-image, text-to-video) for collaborative creation. After a brief group discussion to recreate a story from Inside Out (an animated film), each group used ChatGPT-4 and InvideoAI for 20 minutes each. In Appendix A.2, we added one of the prompts we provided to ChatGPT to scaffold the children's joint recreation activity. We observed children's interactions and facilitated a *Likes, Dislikes, and Design Ideas* activity, where participants shared feedback on sticky notes and grouped them into themes.

3.3.3 Design Session 3 (DS3): Transformative AI, March 2025. This session examined children's perceptions of GenAI during convergent and divergent co-creation. We introduced (1) image transformation tools (Stable Diffusion V7, MidJourney 3.5) and (2) conversational AI (ChatGPT-4 voice). Children first created stories without GenAI, with two groups working individually and two in pairs. Individual groups then used GenAI to converge their creations (combine ideas), while pair groups used GenAI to diverge (expand ideas). The session concluded with a 5-minute "I Wish Board" activity (Fig. 4A), where children placed preferred AI feature cards

[1]https://chat.openai.com/
[2]https://stability.ai/
[3]https://www.midjourney.com/
[4]https://invideo.io/
[5]Story Cubes: https://www.storycubes.com/en/

Table 2: Design Sessions on Creative Collaboration

Design Session	Research Question	Design Activity	GenAI Tool(s)
DS1: Collaboration without AI	How do children collaborate without GenAI, what challenges do they face, and what support do they wish for?	Create a group story using *story cubes*; facilitators observe and ask verification questions	None
DS2: Collaboration with diverse AI Tools	How do children perceive and evaluate multi-sensory GenAI tools in collaborative creation?	Recreate a known story using ChatGPT and InvideoAI; conduct "Likes/Dislikes/Design Ideas" activity	ChatGPT (text, image), InvideoAI (video)
DS3: Transformative AI	How do children perceive GenAI interventions in convergent and divergent phases of co-creation?	Create stories without AI, then use GenAI to converge or diverge their creations	ChatGPT (voice, text), Stable Diffusion, MidJourney
DS4: Family co-design	What do both children and parents want in a GenAI-assisted collaboration support tool?	Mixed-order story creation with/without AI; focus group interviews with parents; co-design collaborative support tools	ChatGPT (text, voice), Stable Diffusion
DS5: AI as an optional teammate	When and why do children choose to involve AI, and how do they envision it as a teammate?	Discuss whether to use AI using a process bar (*"just us"* vs. *"we + AI"*); conduct physical line-judging on AI appearance, age, and role preferences	ChatGPT (text, voice, image-to-3D), InvideoAI (video)

onto an interaction-circle image to indicate what they wished AI could do in their collaboration with friends.

3.3.4 Design Session 4 (DS4): Family Co-Design Session, April 2025. This session explored families' desires for a GenAI-assisted collaborative support tool. We invited 14 children and 17 parents, some familiar with each other and others meeting for the first time. The 120-minute session involved using ChatGPT, Stable Diffusion, and InvideoAI. To compare experiences with and without AI, three groups created an adventure story without GenAI for 15 minutes, then switched to GenAI for 15 minutes; two groups followed the reverse order. Parents then joined a 40-minute *focus group interview* [86] to discuss how AI helped or hindered collaboration, and to share their hopes and concerns about GenAI in children's collaboration. Meanwhile, children participated in a *Bags of Stuff* activity [138], using paper, pens, and printed images to design collaboration tools. When parents rejoined, they reviewed the children's designs and added ideas.

3.3.5 Design Session 5 (DS5): AI as an Optional Teammate, April 2025. Children co-decided when to use GenAI during three stages of collaboration: (1) learn (explore scientific concepts), (2) create (develop a science poster), and (3) share (prepare to present). For each stage, teams selected either *"just us"* or *"we + AI"* on a worksheet and added short justifications on sticky notes. They then optionally used ChatGPT's multimodal features during their process. During circle time, children explored their preferred AI characteristics using a physical line-judging activity [126]. Facilitators asked three questions: (1) What should AI do when you make a story with a friend? (2) If AI were a teammate, how old should it be? (3) What should AI look like during story creation?

3.4 Data Collection

We audio- and video-recorded all in-person design sessions using the video conferencing platform Zoom (as a recording platform) with a Meeting Owl (360° camera) and an external microphone. In total, we collected 28 videos, totaling 22 hours and 30 minutes. We also collected photographs, researcher notes and reflections, and design artifacts created by the children. Design artifacts included physical outputs (e.g., children's drawings of desired GenAI agents) and digital outputs (e.g., children's prompts and AI-generated content). We stored all data in our university's secure, password-protected cloud storage, accessible only to the research team.

3.5 Data Analysis

We analyzed our data using reflexive thematic analysis (TA) [18, 19], an iterative process of developing and interpreting patterns in qualitative data. TA differs from post-positivist approaches that emphasize quantifiable coding reliability and inter-rater agreement [17, 55].

Following Braun and Clarke's approach [18], the first author and three co-authors reviewed all co-design session videos and wrote analytical memos (AMs) to build familiarity with the data. A primary reviewer recorded observations at 5-minute intervals, describing (1) behavioral and emotional expressions (e.g., excited, frustrated), (2) children's spoken quotes (e.g., "It kept on saying 'great'…" from DS3), and (3) their prompts and chat history with GenAI (e.g., "How do you become smart?"). Altogether, we produced 262 pages of analytical memos.

We then developed initial codes inductively through open coding based on data we found in the AMs. Example codes include "Divergent activity," "Building on AI output," and "Roles between children and AI." While the first coders applied and the second coders reviewed these codes across the AMs, the first author and

three researchers met weekly over two months to iteratively refine the codebook to ensure it captured key data patterns relevant to our research questions.

After documenting all sessions, we refined the codebook by drawing on prior work on joint media engagement [123], collaboration [10], and creativity [112]. The research team–including the first author, three co-authors involved in the initial code development, and senior researchers–met three times to finalize the codebook. Examples of our final codes include "Mutual engagement in the activity", "Complex role dynamics among children", and "AI as creative supporter".

Next, we developed and refined interpretive themes by synthesizing codes through collaborative review. The team discussed data (quotes, observations, artifacts) twice a week over a month and iteratively defined and refined the themes. For instance, the codes "Complex role dynamics among children" and "Reduced peer engagement and attention" were merged into the sub-theme "AI's overlooking of group dynamics," which became Subsection 4.2.1. Then, sub-themes such as "AI's overlooking of group dynamics," "AI's unresponsiveness to the group," and "AI dominates children's agency" were clustered into the broader theme "GenAI's negative impact as a social barrier," which became Section 4.2. We include the final coding scheme with representative coded excerpts in the supplementary materials.

We implemented a consensus process [25, 59] to ensure accuracy and establish trustworthiness in our findings. After the first coders applied the codes to the AMs and artifacts and documented the rationale for each assignment, a secondary coder reviewed each assigned code, marked agreement ("+1") or disagreement ("−1"), and provided comments explaining their reasoning and suggested alternatives. We then resolved discrepancies through multiple discussion rounds until full consensus was reached.

4 Findings

Based on our analysis of the design sessions and artifacts, we found that GenAI could both support and hinder children's creative collaborations, while also creating middle-ground situations. We organize our findings into: (1) GenAI's positive influence on social dynamics, (2) its negative influence as a social barrier, (3) the tensions and trade-offs in its use for peer collaboration, and (4) parents' and children's expectations, highlighting shared hopes and nuanced differences.

4.1 GenAI's Positive Impact on Social Dynamics

4.1.1 AI Shifts Children's Social Dynamics Through Mutual Engagement. When children worked with unfamiliar peers or peers who showed little interest in ongoing creation, GenAI's outputs became a shared focus that helped them engage more actively and initiate conversations. For example, in DS4, children and parents were asked to co-create a story using ChatGPT and Stable Diffusion in groups with unfamiliar peers. In Group 2, Maya initially expressed hesitancy working with children she did not know. When her mother encouraged her to speak up to the other children, Maya resisted, replying, *"But they are not my friends."* This reluctance persisted until the group began using ChatGPT. As the children created AI-generated images for their story, we observed strong excitement. Children, including Maya, leaned forward, stood up, and responded enthusiastically: *"Let's see, let's see! Please let it be good!!"* When the image appeared, positive reactions such as *"I like it!"* followed, and the children continued discussing how to improve it. Similarly, during the non-GenAI portion, Carter in Group 1 remained passive, replying *"Nothing"* with slight annoyance whenever his mom repeatedly asked for his ideas. However, once the group began using ChatGPT, he engaged by referencing AI-generated outputs and asking peers about images. Other children joined in, critiquing and suggesting alternatives through the shared digital medium. In the post-session focus group interview, Carter's mother reflected on his behavior using the GenAI tools together. *"He took some time to warm up, but once it shifted to the AI side, he became more involved and started collaborating."* These cases highlight that children's attitudes often remained unchanged even when parents prompted them to engage more. In contrast, GenAI's creations shifted children's attitudes toward both the activity and their peers, fostering mutual engagement.

4.1.2 Human vs. AI Teaming: AI Fosters Playful Dialogic Inquiry. We found that with GenAI, children sometimes worked as a unified team against the AI's mistakes or mismatches, fostering bonding through joint problem-solving, critique, and coordinated action. They often framed GenAI as something external to "our team" that they needed to fix, improve, or teach to achieve the desired result. In DS2, when VideoAI produced a video with an unintended creepy background, Chloe and Sophia quickly aligned on a revision: *"Video is good, but why is that creepy background there? Maybe we should get rid of the guy and make the clouds transparent."* After receiving an "anime-style" version closer to their intent, they responded enthusiastically, *"I love it! This is great!"*, and continued co-editing by sharing feedback and exploring new outputs together. Similarly, in DS3, Group 1 laughed when Voice GPT misheard "bob" as "dog." They teased the AI's mishearing, worked together to correct it, and clapped together when the update matched their intent.

Interacting with GenAI also created opportunities for children to take on new roles in the group. In DS5, Ava initially worked alone and remained somewhat apart from Anthony and Violet during the non-AI portion of the activity. However, when Anthony and Violet struggled to interpret an AI-generated conceptual image about detecting emotions in robots, Ava stepped in: *"That's the voice, and that's the face..."*. Her explanation prompted Violet's follow-up questions and led to a group discussion. From there, they collaborated more actively, dividing tasks and deciding who would create or share different parts, even after AI use ended. These cases show how GenAI's errors or unexpected outputs could prompt children to coordinate, critique, and co-create as a cohesive team, fostering peer collaboration through the shared process of interpreting and improving AI-generated work.

4.1.3 AI Encourages Co-Creation with Shared Ownership. Our findings suggest that GenAI can help children co-create content and develop a sense of shared ownership. Children were eager to contribute their own ideas to GenAI, treating it as a partner that could expand their creation. For instance, in DS5, Madison and Grace were creating a science poster describing "how robots become smart." They first drew a robot on paper (Fig. 2A), then uploaded it to ChatGPT and asked for a 3D version. When the AI produced the 3D

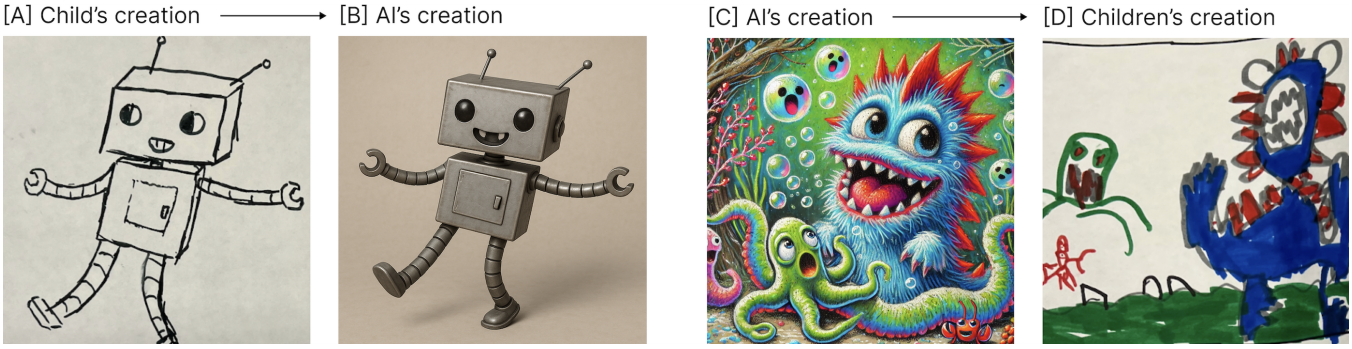

Figure 2: Co-creation between children, GenAI, and peers. Children's creations influence GenAI's outputs and vice versa. Through curiosity, critique, and playful exploration, children engage in creative collaboration–giving and receiving inspiration from both peers and the AI.

image (Fig. 2B), they reacted with broad smiles and high-pitched laughter, excited by the AI's ability to make their drawing look more realistic. Even when dissatisfied, children treated AI outputs as shared starting points for further collaborative development. For example, Jameson and Sam reacted with playful disapproval to one AI-generated image (Fig. 2C), standing up, pointing at it, and saying, *"I hate this guy, it looks like a dinosaur"*. Rather than discarding it, they incorporated and expanded on its concept while working on their drawing (Fig. 2D).

Also, we found that GenAI helped children move from "own" work to "our" work by encouraging them to be open to explore other ideas with children and GenAI. GenAI supported this shift by transforming their creations, when children were not close friends. For example, in DS3, children first created their own work individually and then used GenAI together. When adults asked the children to share their ideas, all children in Group 1 refused. Kai said, *"I don't want to share my idea with other people that didn't even help on it,"* and Violet added, *"Why do we have to share? I don't want to share."* However, when adults introduced ChatGPT and it asked children to share their ideas one by one to combine them, they voluntarily shared, listened to others, and built on each other's contributions.

Children who collaborated smoothly without GenAI were those who already had close friendships. In DS1, Group 3 created a story together by sharing ideas and suggesting different perspectives. Children explained that this was easy because they were best friends. As Neel said, *"We combined the ideas. It was easy for us because we have known each other for five years."* When asked if it would be as easy with someone else, Chloe replied, *"With someone else, no. Probably a little harder."* These cases suggest that moving from "own" to "ours" requires a willingness to compromise, which come more naturally in close friendships. In contrast, when children were not close friends, GenAI sometimes helped by prompting them to share and combine ideas, making collaboration feel easier.

4.2 GenAI's Negative Impact as a Social Barrier

4.2.1 AI's Overlooking of Group Dynamics Undermines Children's Mutual Engagement. We found that including GenAI in children's collaborations can complicate role distribution, especially when it is introduced early, before roles among children are established. In DS4, Julia, an older child unfamiliar with the other children in her group, struggled to take on either a leadership or peer-like role while working with two younger boys who were already close friends. When the boys enthusiastically built on each other's ideas with Stable Diffusion's outputs, Julia found it difficult to step in, both due to the fast-paced interaction between peers and AI, and her own hesitation to assert dominance. During the post-session parent group interview, Julia's mother reflected on the challenge of having AI as the fourth collaborator:

> *"Having AI as a dominant fourth collaborator is tough, especially in early idea generation. She was in a group with two younger friends and is trained to defer to younger kids, as that's what being a good older person means. It made it harder. She had to adjust her ideas based on what was happening in the group, with added complexity from the group dynamics and the AI."*

This moment highlights how GenAI's presence can sometimes make it harder for children to navigate emerging group roles, especially when age-based expectations or prior relationships are unclear.

Difficulty in allocating roles between children also arose when a dominant user did not take turns using AI with others, shifting interaction toward child–AI exchanges rather than child–child collaboration and preventing peers from performing natural roles in the group. In DS5, Group 2 failed to reach consensus on whether to continue using GenAI or move on to preparing their presentation: Kai, who controlled the keyboard, insisted on repeatedly re-prompting ChatGPT (*"I want to see how many tries it takes to get it right"*), while William countered, *"No, we'll be here forever."* Similarly, in another group from the same session, Ariana, an older peer, typed a new prompt after briefly skimming the AI's long output, without checking in with Aria, who was still reading aloud. These examples highlight how GenAI's presence can lead certain children to become dominant by taking on the operator role, increasing the risk of AI–subset-of-children interactions and undermining balanced, peer-to-peer collaboration.

4.2.2 AI's Unresponsiveness to the Group Hinders Children's Dialogic Inquiry. We found that GenAI's limited ability to communicate with multiple children and understand the conversational context sometimes led to breakdowns in collaboration among peers and

Figure 3: GenAI (Midjourney) transformed children's drawings (left) into a specific direction and style (right), which children felt overly scaffolded their creative exploration.

with adults. In DS2, although we prompted ChatGPT to scaffold equal contributions by asking all children's opinions before providing suggestions, it continued scaffolding the storyline by asking only one question at a time. As a result, most exchanges occurred between Voice GPT and a single child, rather than involving all children in the group. Voice GPT often picked up only one child's response and continued the conversation. Its prompts often rushed children to respond quickly to avoid being cut off, leaving little opportunity for peer-to-peer discussion. For example, in Group 2 of the same session, even before children finished explaining their ideas, GPT interrupted with, *"Great idea, how can it change the ending of the story?"* Ariana replied, *"Wait ChatGPT, let us say something,"* and hurried to answer rather than engaging with peers.

GenAI's difficulty in discerning unrelated comments also disrupted collaboration when it misinterpreted them as part of the input. In DS3, while children were using Voice GPT to create a story, Maya asked an adult, *"Can I use the restroom?"* The AI misunderstood this as part of the narrative, responding, *"That's a cool twist"* and incorporating it into the story. These cases illustrate how AI's inability to distinguish between task-related and off-topic speech, combined with its tendency to interrupt without fully understanding social cues, can disrupt the flow of children's collaboration.

4.2.3 Too Close AI Dominates Children's Agency and Co-Creation. We found that GenAI's creations sometimes undermined children's self-exploration by forcing a particular direction or pace of progress. GenAI's scaffolding to combine children's ideas or advance the creation phase could limit voluntary exploration. For example, in DS3, when GenAI tried to merge multiple children's ideas into a single storyline, some children felt their autonomy was being compromised. As Anthony explained, *"We would like ChatGPT to give more suggestions, not change our ideas."* (Fig. 3). A parent in DS4 echoed dissatisfaction with the AI's directed scaffolding: *"The problem was that the AI was always trying to close our idea. Instead of letting multiple people contribute, it pushed us into one fixed direction."*

The presence of GenAI could reduce children's reliance on peers, making collaboration less self-directed, particularly in fact-based creation tasks. In DS5, when children were asked to make a science poster, one child began explaining what she knew, but another refused to accept it, saying, *"You are defining the answer that the AI gave us. You are describing the same thing."* This led the first child to remain quiet and somewhat isolated. These cases illustrate how GenAI can easily take a dominant role in children's collaboration, even when some children neither need nor want its help.

4.3 They Don't Always Want AI: Tensions and Trade-offs of GenAI in Children's Collaboration

Children and parents identified trade-offs in GenAI collaboration, including concerns about their own (or their children's) roles versus the AI's and about over-reliance. We examine these perspectives across three creative stages–learning, creating, and sharing–based on DS5, where they chose whether to use GenAI (Fig. 4B), and integrate parental reflections from DS4 interviews.

1) Learn: While some children valued GenAI in their collaborative learning for its age-appropriate, multi-modal presentations (e.g., "poo" examples, animated infographics), others remained skeptical about the reliability of its creations. In DS5, seven out of twelve children expressed skepticism about the reliability of GenAI's responses. For example, in Group 4, while Anthony and Violet wanted to use GenAI for its quick and targeted guidance, Ava voiced concern, noting, *"AI can give a lot of misinformation sometimes."* Similarly, in

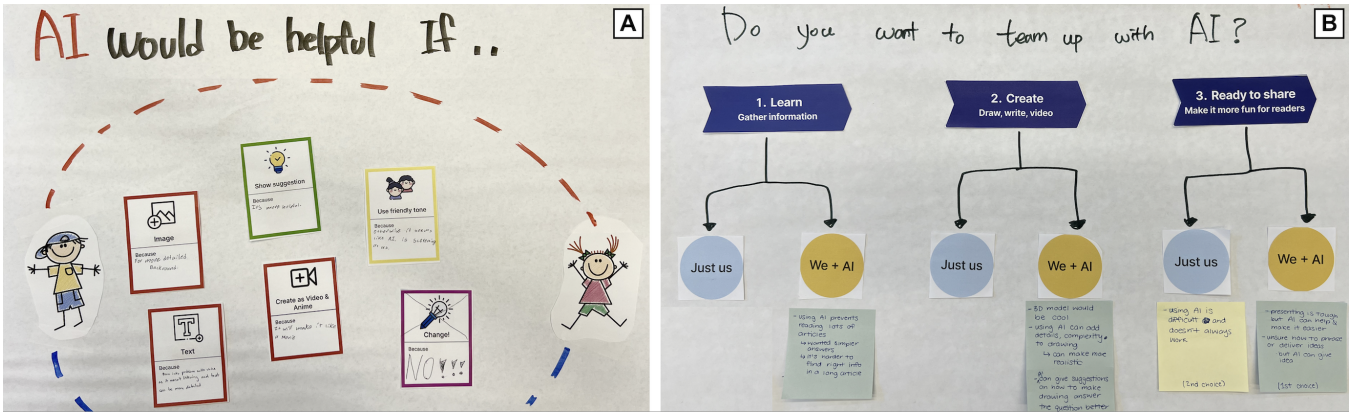

Figure 4: Design artifacts created by children. [A] "I wish board" with cards representing desired GenAI features for collaboration. [B] A decision chart indicating whether to use GenAI across three phases (learn, create, share), with sticky notes explaining choices.

Group 1, children repeatedly prompted ChatGPT with *"tell me the truth."* When a facilitator asked why, Amaya explained, *"Because AI can get things wrong."* These views illustrate a tension between accessibility and credibility, as children appreciated GenAI's age-appropriate and multimodal outputs yet questioned their accuracy and trustworthiness.

2) Create: In DS5, while three of the four groups chose to use GenAI during the creation phase to transform their drawings into new forms, one group opted out, expressing caution about overreliance on GenAI. As Anthony explained: *"For the creation phase, we chose not to use AI, since we already used AI during the learning part, we felt like we didn't need it again."* Parents shared similar concerns about GenAI's influence on creativity in group interviews. They worried that AI's directive scaffolding and limited stylistic diversity could constrain children's ideas and artistic expression (see Fig. 3). Brody's dad noted, *"AI prompted children into the classic story. I feel the kids had a more creative story without any AI prompts."* Similarly, Chloe's father worried about GenAI's influence on artistic expression, and other parents agreed: *"All the images we got looked a certain way. I wonder if that influences how children will draw or create."* These opinions reveal a trade-off between creative support and autonomy, as GenAI's guidance both assisted and constrained children's expression.

3) Share: In the share phase (DS5), where children finalized their creations and prepared to present them to peers, only Group 2 chose to use GenAI, while the other three did not. Kai (Group 2) explained, *"AI can do stuff that I can't do, we can't make a video like that."* In contrast, the other groups prioritized their own voices and valued uniquely human ways of communicating. For example, Ava emphasized that using GenAI would deprive her of the opportunity to organize her intentions for sharing: *"I'd rather write it myself so I can have a deeper understanding of how I present. If AI writes something, you're just reading it, you're just memorizing."* Others wanted to deliver their message through personal expression rather than using GenAI. For example, Madison and Grace chose to act out their presentation themselves and showed great excitement through active physical engagement while preparing and presenting their creation. These examples show a tension in the share phase as children recognized that GenAI could produce outputs beyond their abilities, yet many still preferred to present work that reflected their own intentions, effort, and authenticity.

Overall, children appreciated GenAI's creative support, yet tensions emerged as they questioned the credibility and authenticity of AI-generated output. Parents also expressed concern that GenAI could restrict children's creative exploration, particularly during the creation phase.

4.4 Parents' and Children's Expectations of GenAI in Creative Collaboration

4.4.1 Parents' and Children's Desire for Socially Attuned AI. Children and parents envisioned GenAI not as a source of directive suggestions, but as a partner that respects children's agency, recognizing social dynamics and intervening only at appropriate moments. Rather than dominating the process, they wanted AI to support creativity by waiting for turns, preserving ideas, and leaving room for disagreement.

1) AI should be a good listener: Children expressed dissatisfaction with GenAI's lack of awareness of social cues and conversational context, expecting it to follow the same social norms as human collaborators. They were particularly sensitive to how GenAI listened and responded, often describing voice-based interruptions as violations of turn-taking. For example, Amaya said, "*"AI didn't listen to us."* and Sophia expressed a wish for AI to be more attentive: *"Do not speak unless I ask, do not interrupt me."*

Parents also noted GenAI's limitations in recognizing and responding to children's voices; for example, Brody's mother remarked, *"GenAI cannot understand Brody at all. AI needs to be able to understand children's voices."* These concerns translated into a wish for AI that could listen attentively, wait its turn, and accurately interpret children's speech before responding.

2) AI should be an authentic speaker: Children expressed skepticism toward GenAI's use of generic praise and overly agreeable responses, behaviors that felt inauthentic in interaction. For instance, Ryan shared, *"It kept on saying 'great' when I was about to*

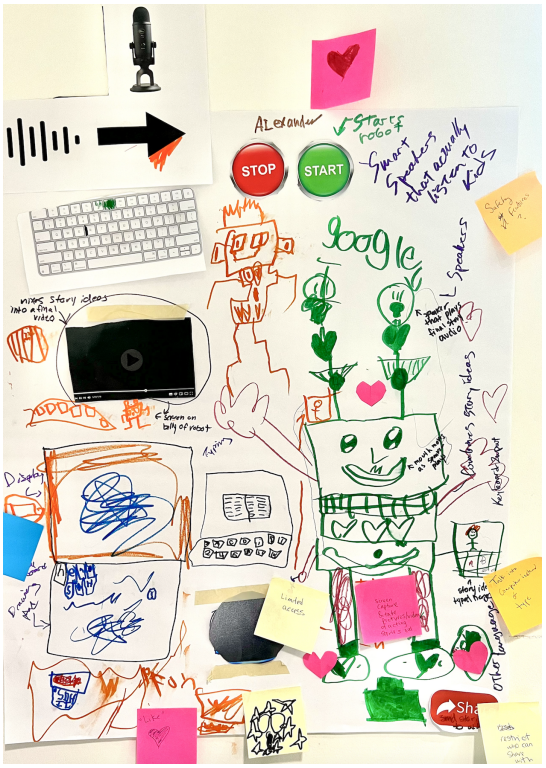

Figure 5: One of the collaborative GenAI tools children created in DS4. They designed a friendly partner that listens well, speaks authentically, turns ideas into videos, and supports multimodal inputs. Stickies show parents' added ideas.

start a sentence or 'really cool.'" Ava noted that GenAI's tendency to always agree, without offering an alternative or critical perspective, undermined its usefulness as a collaborative partner: *"Whenever we gave AI information, it said 'oh yeah,' and if we gave different information, it just agreed and discarded the old one without questioning it."*

Parents' concerns focused more on how GenAI communicated its ideas and reasoning. For example, Carter's mother said, *"I think AI should ask more open-ended questions rather than leading ones or giving answers,"* and Ryan's grandfather shared, *"When AI generates a solution, it should also explain the thought process, how did it arrive at that? We didn't understand how AI got there."* These examples suggest that children wanted more context-aware interaction, including constructive disagreement instead of surface-level praise, while parents wanted guided inquiry with explanations.

3) AI should be a responsive group supporter: Children wished for GenAI to help with tasks they could not do alone, such as turning drawings into videos while preserving the core of their creations. In DS4, several groups envisioned a "wishful tool" as a robot (Fig. 5) that could synthesize individual inputs into a shared video: *"AI combines the ideas and shows up, turns them into a video."* Similarly, in DS5, children voluntarily used GenAI to merge and animate their drawings: *"We used AI to help us generate ideas, assist with drawing, and turn them into a video."* However, children also expressed frustration when GenAI changed their ideas instead of building upon them. Anthony noted, *"We didn't really combine anything. AI just changed it."* Similarly, Ariana remarked, *"We didn't really like AI because it completely changed our idea."* These reactions show that children wanted AI to act as a responsive follower that assists the group process without dominating or redirecting it.

Parents focused more on whether and how GenAI could strengthen human–human collaboration without dominating the interaction. They worried that most GenAI tools are designed for individuals and overlook group dynamics. Julia's mom cautioned that this could lead to social exclusion: *"There's a real danger in social, gendered, age, like cultural dynamics playing out. If AI isn't thoughtful about how it engages kids, and especially if it doesn't know it's in a group, it's gonna default to thinking you're one person and just interact with you alone."* Other parents agreed, emphasizing the importance of equity: *"GenAI should make sure there's equitable participation among all three kiddos."* Also, they expressed concern that GenAI might undermine child–parent relationships if it assumed too much authority. For example, Maya's mom shared: *"Fear for me is that children become reliant on GenAI. I hope it won't replace relationships that parents have. But it could, and it could become more of an authority figure than us. Like, AI says, 'Mom, in this situation, you're actually supposed to be quiet.'* At the same time, some parents saw GenAI as a tool to enhance children's creative confidence. Maya's mom suggested that it could *"make children's creations more professional"* and help them *"feel more proud of their stories."* Brody's father added, *"Something he could share and be proud to give to his friends."*

Together, both children and parents wanted GenAI to support rather than lead. Children emphasized responsiveness and idea-following, while parents hoped AI would enhance person-to-person interaction and maintain equitable participation without replacing human connection.

4.4.2 Desire for an Older Sibling or Peer-like AI. When asked about an ideal GenAI collaborator, children imagined a peer or slightly older sibling, while parents envisioned an older sibling figure who is relatable and easy to disagree with.

Children: In the line-judging activity in DS5, when we asked, ***"If you were teaming up with friends and AI, how old would you want the AI to be?"***, seven out of twelve children preferred an **AI that was younger, the same age, or slightly older than themselves**, while five chose an adult-like AI. Many explained that they wanted an AI without authority: *"I hope AI doesn't try to take over, not in a position of authority." "I hope AI doesn't talk too much." "I hope it wouldn't correct me."* At the same time, children also expressed a desire for help and support. Amaya, who has an older brother, chose an older-sibling-like AI: *"I want AI like older brother, because it can help me."* These responses suggest that children wanted a collaborative partner who supports their ideas in a friendly and equal way.

Parents: Parents, by contrast, tended to idealize GenAI as a slightly older, more mature figure. They described the ideal **AI as having the personality of an older sibling**, which is able to guide children's interactions while remaining approachable and open to dialogue. In both focus group interviews, parents emphasized this "older sibling" dynamic:

> *"I feel like AI has to be a little older sister. My child listens more to adult-like AI, but with a peer, they might argue. They listen to an older sister, maybe because she has a little more authority but still understands them, someone they look up to but who's still at their level."*

In another group, Sam and Jameson's parents also proposed, *"GenAI would need to take on the roles that we [parents] took. Like stopping people, taking turns, or prompting, 'Let's hear what Maya thinks.'"* Others agreed and emphasized the need for guided experiences: *"Like, 'Sam, we haven't heard from you lately. Please speak up.'"*

These examples reveal that while children sought an "equal partner", parents wished for a "a gently guiding collaborator" who could guide and structure collaboration. Both perspectives converge on the idea of a socially attuned, non-authoritative AI, yet differ in where they draw the line between equality and guidance.

5 Discussion

Our analysis shows that GenAI could both support and hinder collaboration, creating middle-ground moments that revealed trade-offs across collaboration process. GenAI helped children bond through playful "human vs. AI" teams, teasing, critique, and shared ownership (4.1), yet it also overlooked children's social contexts, disrupting peer collaboration, complicating role dynamics, and limiting children's agency (4.2). These mixed experiences shaped how children and parents envisioned future GenAI: children imagined a collaborator around their age, while parents envisioned it as an older sibling who supports collaboration, respects human connection, and preserves children's agency (4.3, 4.4).

Based on our findings, this discussion (1) examines how GenAI shapes children's collaborative processes through the lens of productive Joint Media Engagement (JME) [123], and (2) proposes design implications for GenAI systems that better support children's collaboration.

5.1 GenAI's Impact on Children's Creative Collaboration

In this section, we examine the benefits, drawbacks, and trade-offs of GenAI in children's creative collaboration through the lens of productive JME [123], with a focus on **peer-to-peer collaboration** compared to prior technologies. Children's interactions were fluid and context-dependent—the same child sometimes shifted between positive and negative experiences within minutes. This section therefore offers a **snapshot of tensions in GenAI-mediated collaboration**, rather than claiming stable or fixed patterns. We address the following questions for three JME concepts:

(1) Mutual engagement: Do all children remain equally motivated and involved, or does anyone become disengaged or overpowered? (Sections 4.1.1 and 4.2.1)
(2) Dialogic inquiry: Does GenAI prompt children to question, critique, and make meaning together, or does it limit opportunities for dialogue? (Sections 4.1.2 and 4.2.2)
(3) Co-creation: Do children use GenAI to build shared artifacts and understandings, or do they end up passively consuming or working in isolation? (Sections 4.1.3 and 4.2.3)

Other JME concepts also appeared but less prominently. *Boundary crossing* and *intention to develop* may require repeated engagements to observe fully, while the *focus on content over control* resembled patterns seen in prior technologies [13, 123]. We outline directions for examining these aspects in future work (Section 6).

Based on our findings, we propose future directions for JME research in the context of GenAI (Figure 6). Traditional JME work has largely examined *one-directional media* (e.g., games, online videos), thereby foregrounding child and adult roles (e.g., bystanders, spectators, coaches) [60, 136] (Figure 6A). In contrast, GenAI functions as an *adaptive multi-role agent* that can assume multiple roles and actively shape children's social dynamics–at times supporting collaboration and at other times creating tension (Figure 6B).

Accordingly, we encourage future JME work to conceptualize GenAI not as *passive media (square)* (Fig. 6A), but as an ***active collaborator capable of taking multiple roles (rounded square–between circle and square)*** (Fig. 6B). This framing will help future HCI researchers and designers examine how GenAI shapes and influences multi-child collaboration alongside other human partners.

5.1.1 Mutual Engagement. Our findings indicate that involving GenAI in peer collaboration can enhance children's experience of mutual engagement by fostering shared curiosity; however, GenAI can also create tensions when children's attention shifts from peers to the tool. This dynamic reveals a trade-off between individual engagement and collaborative cohesion. When children focused more on the AI than on each other, collaboration often broke down, as GenAI's *unpredictability and responsiveness* [1, 70] could steer their interactions toward AI-centered exchanges.

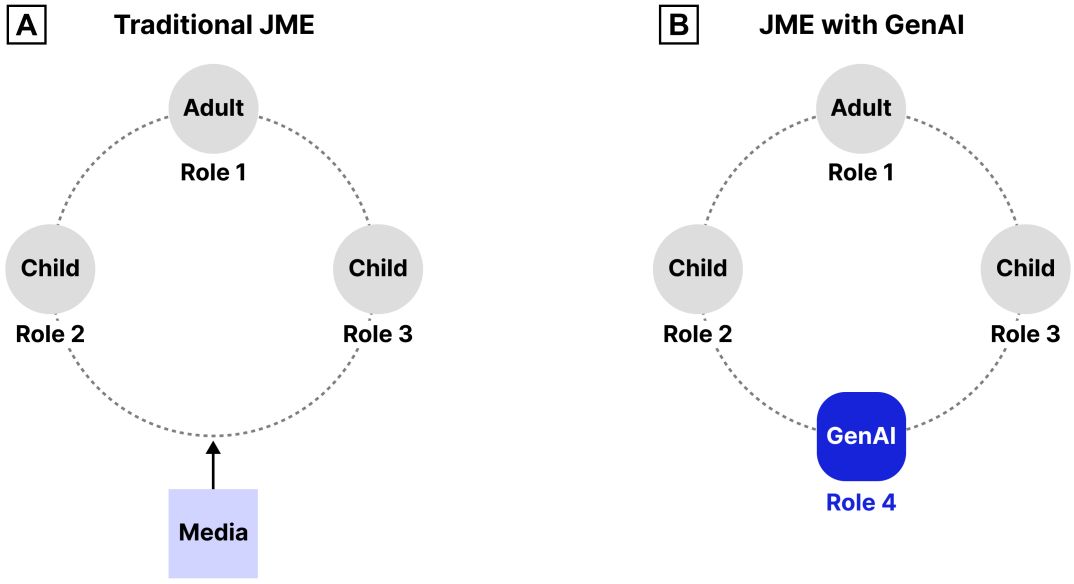

Figure 6: Conceptual diagram of JME research. Circles represent participants; dashed lines indicate social interaction. (A) In traditional JME, media is often considered a *passive entity* (square), leading to greater focus on child and adult roles [60, 136]. In contrast, (B) We propose that future JME research with GenAI also examine AI's roles *as an active collaborator* (rounded square–between circle and square), as GenAI can take on multiple roles and shape social dynamics in distinct ways. All participants in both figures can take on multiple roles.

GenAI often amplified children's curiosity and investment, aligning with prior work showing its ability to enhance shared excitement, support turn-taking, and strengthen relationships [43, 78]. Notably, even negative emotions often sustained engagement. When dissatisfied with GenAI's creations, children often remained engaged by teaming up "against" the AI through teasing, critiquing, and trying to improve its outputs. These dynamics show how GenAI introduces new forms of convergence and divergence in collaboration. Differing perspectives can be productive, since teams benefit from diversity [106].

However, when attention centered too heavily on the AI, its responsiveness became counterproductive. Although children did not state this directly, observations and parents' comments in the focus group interviews indicated that AI could overshadow peer to peer interaction (Section 4.4). Unlike prior technologies such as e-books and iPads [100, 105], which support both child-led and adult-guided interactions [14, 60], GenAI's fast feedback sometimes made children prefer to refine their ideas directly with the tool instead of working with others (Section 4.2.1).

Together, these dynamics highlight a trade-off between engagement and collaboration: GenAI can sustain individual task-focused engagement but may reduce opportunities for attention toward peers. We therefore propose that future JME research on GenAI conceptualize **mutual engagement as a balance of attention between peers and the media**, rather than only shared participation [60, 123]. Future HCI work should examine how to design GenAI that strengthens peer-to-peer engagement, as emphasizing interaction with the tool may weaken collaboration.

5.1.2 Dialogic Inquiry. We argue that GenAI's *conversational capabilities*, its ability to recognize children's speech and generate dialogue, can foster group listening and responsiveness, yet also disrupt conversation when it misinterprets language or gives context-unaware feedback. Parents and children also held somewhat different expectations for how GenAI should participate in these exchanges.

In our study, this affordance sometimes helped children listen attentively and respond more readily (Section 4.1.2). Children engaged with the voice system and even teased its speech recognition errors, echoing prior work showing how conversational agents can sustain engagement and foster dialogue [54, 73]. On the other hand, GenAI's conversational responsiveness revealed important limitations. Unlike voice assistants such as Amazon Alexa or Google Assistant, which often ask clarification questions when uncertain [12, 13, 38], GenAI frequently continued conversations even after misunderstanding children's utterances (Section 4.2.2). This proactive behavior frequently led to breakdowns and frustration, with children repeatedly noting, *"It didn't listen to us."* Children also perceived AI's generic praise such as *"great," "really cool"*, as distracting and context-unaware, disrupting the rhythm of peer dialogue and diminishing the system's credibility. This reaction contrasts with prior work that framed GenAI's positive feedback as beneficial [29]. Since children respond more positively to behavior-specific praise [22, 69], our findings highlight the need for language that is attuned to timing, context, and relational dynamics [26, 34]. In addition, while children prioritized GenAI's genuineness and contextual awareness, parents emphasized maintaining balance among participants and encouraging open-ended dialogue.

Building on traditional JME research that positions media as a reference point for dialogue [104, 143], we suggest that GenAI has the potential to act as a **dynamic conversational partner that can support peer dialogue.** Future HCI research should therefore explore design strategies that adapt conversational styles to both micro-level interactions (authentic, context-aware responses) and macro-level group dynamics (equitable participation).

5.1.3 Co-creation. GenAI's *transformative capabilities*, its ability to convert text, images, or other media inputs into new outputs across modalities [1, 70], can enrich children's co-creation but also disrupt self-directed creative processes, exposing a trade-off between creative expansion and children's agency.

Children critiqued, modified, and merged their work by transforming drawings and shifting across modalities with GenAI, aligning with prior work on GenAI in children's creative processes [31, 88, 145]. We extend these findings by showing that GenAI can also mediate multi-child collaboration. Beyond supporting individual creativity, GenAI facilitated shifts from "my creation" to "our creation" by enabling both divergence and convergence of ideas (Section 4.1.3). While shared devices are known to support idea exchange and collaborative artifact building [83], GenAI went further by fostering shared ownership through reinterpretations that blended individual contributions into collective outcomes.

However, GenAI's transformations sometimes failed to preserve the core of children's creations, overlooking elements they considered essential (Section 4.2.3). While prior work positioned AI as a positive mediator capable of advancing cultural evolution through recombination [21], our findings show that GenAI can override children's intentions and shift agency away from them. Aligning with studies on children's sensitivity to cultural content [31] and parents' skepticism toward AI's creative role [56], children and parents do not always welcome GenAI's reconfigurations.

These dynamics highlight a trade-off in GenAI-mediated co-creation: reinterpretations can broaden children's perspectives but may also create friction when they override children's original intentions. While research on JME traditionally emphasizes human-driven meaning-making [102, 123], GenAI emerges as a mediator that can expand ideas in real time but also risks overriding children's agency. Therefore, we propose to reconceptualize **co-creation as balancing GenAI's creative expansion with preserving children's intentions.** Future HCI work should develop interaction mechanisms that make AI reinterpretations visible and editable, such as highlighting where AI diverged from the child's input or providing range-of-change controls, to enable children to easily revise and redirect the output.

5.2 Design Implications for GenAI in Supporting Children's Creative Collaboration

In this section, we propose design implications to help future designers create collaboration-supportive GenAI for children's peer-to-peer collaboration (Figure 7). Prior HCI work on interactive technologies such as voice assistants (VAs) shows that children and families hold complex social expectations and often experience tensions when interacting with these systems [28, 120, 121]. Our findings echo some of these dynamics but also reveal distinct perceptions specific to GenAI. Building on our findings and prior literature, our design implications aim to maximize GenAI's benefits and mitigate its drawbacks, addressing a key question from our study: *What is required for GenAI to effectively facilitate children's collaboration?*

5.2.1 Design Implication 1: Consider Group Dynamics. We recommend that systems first attend to children's peer-to-peer group dynamics: (1) how they mutually engage, (2) how dialogic inquiry unfolds, and (3) how co-creation emerges during the activity. During peer collaboration, these dynamics can shift quickly due to subtle power dynamics (e.g., who leads) and social risks (e.g., fear of exclusion or hurt feelings). A responsive GenAI system should sense when to step in and when to step back–especially when one child dominates, another withdraws, or the group gets stuck. To do this, the system can ask light-touch questions directed at children or adults during the activity (*e.g., "Are you enjoying working with your friend?", "Are you creating together or working individually?"*). Based on children's responses to the AI's check-in questions, the system can monitor group dynamics and adjust its behavior between more passive and more active roles, as described in Design implication 2 (5.2.2.) As discussed in Section 5.1, GenAI can be helpful at times, yet uninterrupted peer interaction is also valuable, underscoring the importance of systems that flexibly adapt without undermining children's agency [41]. This approach aligns with collaborative learning research showing that collaboration is most effective when children share ideas, listen to peers, remain open to critique, and resolve differences through discussion [4, 10, 72]. However, difficulties in asking for help or giving feedback [52, 94] and even the closeness of friendships [77] can still limit group success, which suggests the need for GenAI that adaptively supports children.

5.2.2 Design Implication 2: GenAI Should Act Responsively to Group Dynamics. We recommend that GenAI flexibly adjust its role–from passive to active–based on children's group dynamics, as children and parents envisioned flexible roles for GenAI ranging from a peer-like responsive supporter to an older sibling-like agent that scaffolds learning and social interaction (Section 4.4). GenAI should scaffold equitable participation in peer groups by adapting its role and behavior, without undermining children's autonomy. We highlight four potential AI roles that support social processes and children's agency in child-centered creative collaboration. Depending on the role it takes, GenAI should adapt its behavior, including language style, pacing, and level of guidance.

(1) **Passive Tool:** Quiet presence before children initiate it through easy trigger.
(2) **Adaptive Guide:** Scaffold diverse creative and knowledge exploration through adaptive content.
(3) **Social Moderator:** Moderate children's social interactions with authentic attitude, rather than being sycophantic or dominant.
(4) **Collaborative Creator:** Foster children's shared ownership through expanding their ideas into diverse forms.

(1) Passive Tool. In this role, GenAI functions as a background tool that supports child-initiated interaction without interrupting peer collaboration. As children in our study preferred, we propose

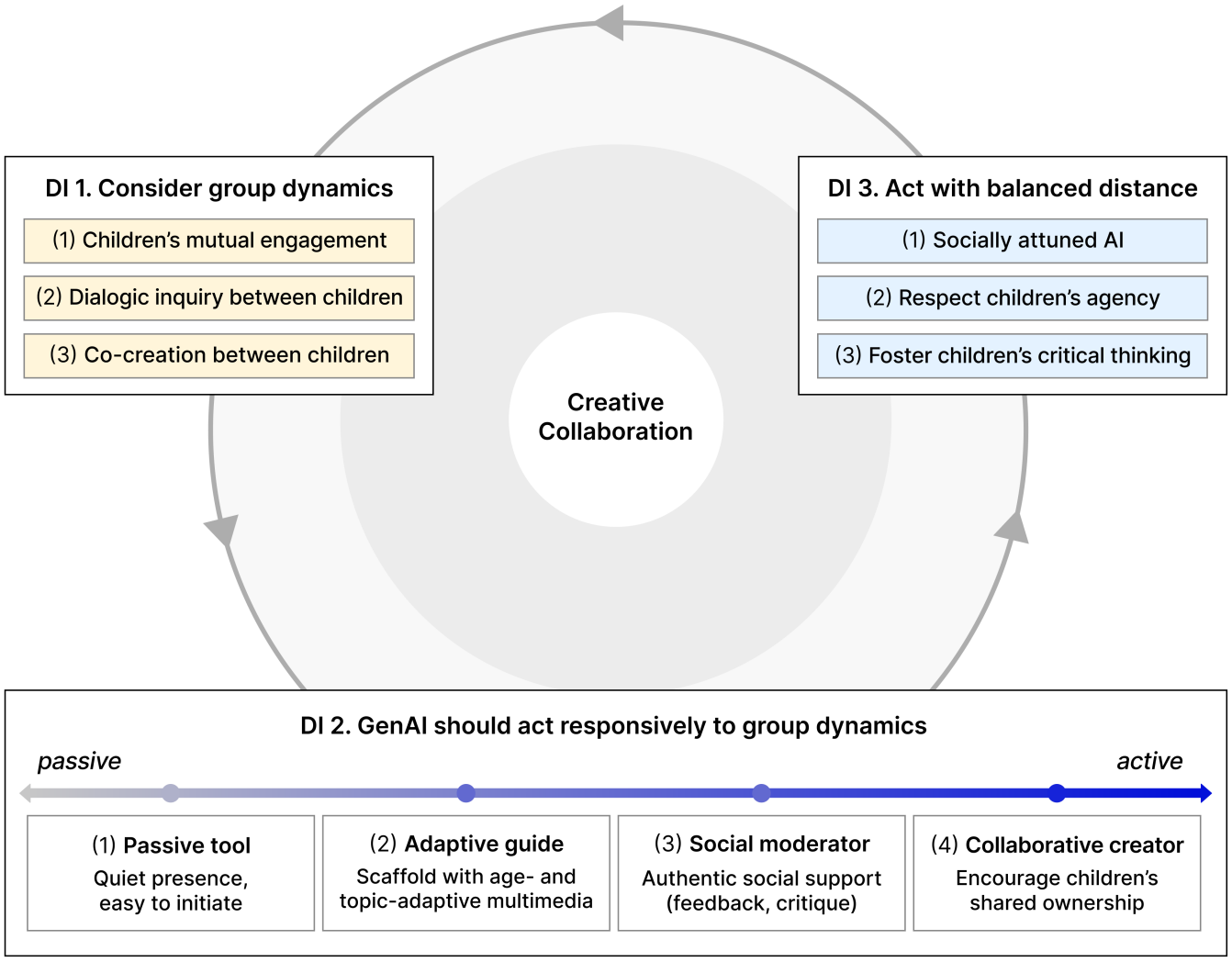

Figure 7: Conceptual model describing design implications for designing GenAI to support children's creative collaboration. The boxes represent each implication, and the circular form highlights that they are iterative and should be revisited rather than followed as a fixed linear sequence.

that future **GenAI systems aim to act as a good listener**, since misinterpreting children's context or disrupting their dialogue can break down collaboration (Section 4.4.1). Prior work also shows that over-involvement of active technology can introduce fatigue and reduce the depth of human-to-human communication [95, 119]. Both children and parents expressed concerns about overreliance on GenAI (Section 4.3), consistent with prior findings that AI may diminish children's sense of agency [32, 50]. We propose it stay quiet and inactive by default, but readily accessible when children choose to prompt it. This can be achieved via multimodal "wake" cues such as voice, gaze, or shared gesture recognition that activate GenAI only when children signal intent.

(2) Adaptive Guide. In this role, GenAI can serve as an engaging guide by delivering knowledge through adaptive multimedia. In our study, children enjoyed transforming text into images or videos that made information easier to understand and more engaging (Section 4.1). Prior work has similarly highlighted GenAI's potential to support adaptive and creative learning [6, 101], emphasizing its capacity to generate age-appropriate, topic-relevant content that enriches learners' experiences [135]. **GenAI should provide diverse adaptive guidance options** in multi-child settings to support children with different developmental levels. Prior work shows that when children differ in developmental readiness, inclusive and interactive learning activities promote collaboration and mutual learning [85], and multi-sensory formats help sustain engagement [74, 103]. Designers can leverage GenAI's adaptability by offering varied visual or verbal modes and allowing children to select GenAI identities (e.g., playful, formal) to match group needs.

(3) Social Moderator. In this role, GenAI can assist children's social interactions and help them feel genuinely respected throughout

the collaboration by using open-ended language, avoiding artificial praise, and intervening based on participation cues. Children and parents in our study emphasized the value of socially supportive AI, such as helping deliver ideas and supporting turn-taking among peers. This aligns with prior work showing that AI can shift group dynamics in collective creation [122] and can encourage children to consider each other's contributions and sustain their engagement in collaborative activity [43, 78, 88]. At the same time, **GenAI should avoid dominating the interaction or acting as a "yes-man."** For instance, excessive praise (e.g., repeatedly saying *"That is a good idea!"*) or quickly shifting topics (e.g., *"You're right, let's do this instead."*) made children skeptical and disrupted collaboration in our study. Instead, GenAI could monitor participation equity by detecting when a child is being overlooked (e.g., via speaking turns or speaker identification) and scaffold balance through open-ended prompts such as *"I wonder what Maya thinks,"* rather than directive language. This aligns with prior work showing that children often react negatively to technologies that mimic humans too closely [20, 139], and that assertive interventions can undervalue human connection [101, 111].

(4) Collaborative Creator. In this role, GenAI can scaffold contributions from multiple children and foster shared ownership of creations as a balanced co-design partner. By generating divergent or convergent multimodal outputs from children's ideas and drawings, GenAI can help them work together, aligning with research on adult collaboration [108, 127]. Creative collaboration emerges when peers actively suggest and discuss ideas [113, 125]. In our study, consistent with prior work [31, 88], children collaborated by interpreting, explaining, and transforming their ideas with GenAI (Section 4.1), broadening perspectives and fostering shared ownership. However, our analysis showed that GenAI's scaffolding differed from adults. Adults often support collaboration through open-ended questions, whereas GenAI tended to propose concrete ideas or generate artifacts. This can expand children's possibilities but also risks leading them to follow AI outputs passively. Therefore, future **GenAI systems should form balanced co-design partnerships with children**, expanding their ideas and co-creating without being directive, building on the notion of balanced child–adult co-design relationships [140]. To operationalize this, the AI system can provide diverse "co-editing" modes, prompt low-pressure negotiation among peers, and support turn-taking and remixing so the group can stay engaged in creative collaboration.

5.2.3 Design Implication 3: Act with Balanced Distance. GenAI should be designed to intervene with balanced distance in children's creative processes by (1) socially attuning to the peer group to support co-creation and relationship maintenance, rather than drawing children into individual child–AI interactions, (2) respecting children's shared agency, and (3) fostering critical thinking.

(1) Socially attuned AI: Support child–child interactions. GenAI should be designed so that children interact more with peers and adults, rather than mainly with the system. In our study, GenAI's interruptions and tendency towards child-AI interaction was strong, potentially because children tended to overestimate AI's capabilities and trustworthiness [33, 36]. Parents also voiced concerns that GenAI might take over parental roles or undermine parent-child relationships (Section 4.4.1), aligning with prior findings on conversational technologies [50] and GenAI [147]. Therefore, future designers should carefully design GenAI's level of interactivity and include mechanisms that let groups decide when and how to use it [143]. This can include prompts that require input from multiple participants (e.g., *"Build on your friend's idea," "Decide together first, then tell me."*) that distribute attention across peers and balance AI responsiveness with social reciprocity.

(2) Respect children's agency. Future GenAI should preserve children's agency in creative processes, enabling them to discuss, create, and make decisions voluntarily. Although prior work suggests that interactive creation with LLMs can support children's agency [78, 148], our findings reveal challenges: children expressed frustration when GenAI became uncontrollable, and parents worried that AI suggestions restricted children's creative exploration (Section 4.3). Excessive AI-provided knowledge may create an illusion of rapid progress while overloading children's cognitive capacity and undermining learning [131]. Extending this, GenAI-driven progress may push children to finish outputs rather than develop collaboration skills or explore creativity with peers. To address this, designers could embed child-led controls, such as adjustable AI participation levels or cognitive-forcing features [23] that prompt reflection before accepting AI inputs. These mechanisms can help balance guidance and autonomy, allowing children to maintain agency and collaborate with peers at their own pace.

(3) Foster children's critical thinking. We propose designing GenAI systems that actively support children's critical thinking by scaffolding them to compare AI outputs with their intentions and to critique those results, thereby supporting AI literacy. In our study, children became more skeptical of AI's reliability and abilities after repeated use (Section 4.3). By DS5, seven out of twelve children audibly expressed critical attitudes, saying things like *"tell me the truth"* or *"AI can give a lot of misinformation."*. Creative collaboration thus created opportunities to recognize GenAI's limitations, experience failures to capture intentions, and practice joint critique. Prior work shows that creative activity fosters collaborative problem solving [37, 92] and learning [11, 38, 91]. Building on research that identifies family contexts as important sites for AI literacy [38], we suggest that creative collaboration with GenAI is also a valuable setting for developing these skills. Future systems might, for example, show side-by-side comparisons of children's inputs and AI outputs or prompt brief group reflection before revising (e.g., *"What do you both think about this result?"*), encouraging dialogue while balancing curiosity with critical reflection.

6 Limitations and Future Work

Our study was conducted at a university located in an urban region of the United States. Some children were already familiar with technology and with our university-based co-design group, while others (in DS4) were new to the setting and peers, which may have influenced both collaboration comfort and perceptions of GenAI. Because the study took place in a university setting, the activities may not fully reflect children's everyday environments such as school or home. We selected this controlled setting to explore GenAI's early potentials before extending to more ecologically sensitive contexts. As such, our findings are intended to offer initial

conceptual insights rather than statistical generalizability [137]. We also did not collect detailed parental information (e.g., AI literacy or socioeconomic background), as our focus was on GenAI's role in child–child collaboration rather than parent–child interaction. Based on our findings and protocols, future work could examine how these insights hold across diverse cultural contexts, everyday environments, creative tasks, and how parental perceptions vary across socioeconomic backgrounds.

Additionally, we used a limited number of GenAI applications that were originally designed for individual rather than collaborative use. We selected these tools because they are mainstream GenAI applications and are already used by children. However, they may not fully represent the potential of GenAI tools explicitly designed for multi-user collaboration. Future work should investigate how collaborative GenAI systems specifically designed for multi-user use may further shape children's collaboration. Finally, our study lasted three months, which may not have been long enough to capture changes in children's perceptions or interaction patterns with GenAI over time. Longitudinal research is needed to understand how children's AI literacy and collaborative experiences evolve with sustained exposure to GenAI. In particular, other JME features (e.g., boundary crossing, intention to develop) not described in this paper may emerge more clearly in studies that design for long-term, repeated engagements with GenAI across contexts or that assign tasks specifically intended to elicit these dimensions.

7 Conclusion

Our study investigated how GenAI affects children's creative collaboration and what children and parents envision its role in these processes. While collaboration has traditionally been seen as a deeply human domain requiring adult scaffolding, our findings show that GenAI can both support and disrupt children's social dynamics depending on the context. Notably, children and parents did not always want GenAI's involvement; instead, they envisioned a socially attuned GenAI, one that respects relational dynamics and provides contextual support only when needed.

While our study focuses on children, the design implications we propose, supporting collaboration while respecting social dynamics and users' agency, could extend to broader communities. Groups needing support in collaboration, such as adults in multidisciplinary teams or those working together for the first time, may also benefit from AI systems that ease communication, foster co-creation, and strengthen mutual engagement. In this way, our findings contribute to ongoing conversations about GenAI's role in multi-human collaboration [7, 57, 88, 122, 132] and encourage the design of AI agents that amplify group agency and contributions, rather than focusing only on improving individual productivity [48, 130]. If tools are designed and research primary for solo creativity could have a risk in creating a false choice: working with AI or working with people [47, 64]. Instead, we envision GenAI systems that prioritize supporting the agency of multiple users in both creation and collaboration, shifting the focus from technical advancement toward socially meaningful human–AI partnerships.

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A Appendix

This appendix summarizes the core procedures for each session, including discussion activities and AI prompts, to assist future researchers who may wish to replicate or adapt these protocols for research or educational use.

A.1 Session Protocols

Session 1: Collaboration without using AI

To understand where collaboration was already working well and to identify where children might need support from adults or technologies, no GenAI tools are used in Session 1.

Activity 1: Story co-creation without AI

- Children create sci-fi stories using story cubes, A3 paper, and pens together with other children.
- One adult acts as a design partner ("pseudo-AI"); another observes and notes observed challenges.

Activity 2: Group reflection

- Adult facilitators ask children verification questions *(e.g., "I noticed this issue. What do you think?")* to prompt agreement, disagreement, or new ideas.
- Children add their own difficulties and share key collaboration challenges.

Activity 3: Group discussion

- Children discuss collaboration struggles and the kinds of support they want from adults or technologies.
- Children respond to prompts such as "I wish AI could help us learn together / turn our work into a video / help us take turns and listen to each other when I collaborate with my friend." They indicate their preference with a thumbs-up or thumbs-down and briefly explain their reasoning.

Outputs: List of collaboration challenges (from children and observers).

Session 2: Collaboration with diverse AI tools

Children use GenAI tools with multiple modalities (image, video, and text) to understand how they perceive and evaluate these tools in collaborative creation.

Activity 1: Story exploration without AI

- Children first watch a video: *Ruby Finds a Worry* or *Inside Out.*
- They discuss how to recreate the storyline and content (e.g., developing a new Inside Out character, changing the worry monster's appearance).

Activity 2: Create stories with friends using diverse GenAI tools

- Children create storyboards by using two of the three GenAI tools to generate the text, images, or videos.
- Adults take observation notes and write on sticky notes about what children like, dislike, and propose as design ideas for each GenAI tool used in their collaboration.

Activity 3: Group discussion

- Children discuss what they liked and what challenges they faced when using GenAI with peers.
- Children discuss what GenAI should do to make future collaboration more fun and effective.

Outputs: Children's tool-specific preferences and design ideas. Adults' observation notes on how each GenAI tool's modality affects children's flow of creative collaboration.

Session 3: Transformative AI (Convergence / Divergence)

To examine AI's impact on children's divergent and convergent collaboration, half of the children first spend 10 minutes creating stories without GenAI, while the other half work individually in groups. Each group then completes either Activity Type A (convergent) or Type B (divergent), scaffolded by GenAI as follows.

Activity 1–Type A: Convergence

- GenAI helps children combine the multiple ideas they created individually. Facilitators photograph each child's drawings and read their stories aloud before inputting them into GenAI with convergence prompts.
  - Image prompt: "Combine image #1 with image #2."
  - Voice prompt: "Combine these two stories created by children."

Activity 1–Type B: Divergence

- GenAI helps children expand on a single idea that the group created together. Facilitators photograph the group's drawing and read their shared story before inputting them into GenAI with divergence prompts.
  - Image prompt: "Based on this image, generate a different version."
  - Voice prompt: "Change the story by altering the plot or a character."

Activity 2: Create "I wish board"

- Groups of children co-created interaction circles showing how AI might support collaboration between two children by placing preferred AI feature cards (e.g., create images, change ideas, voice features, help with turn-taking, use a friendly or a teacher-like tone) and adding explanations for why they wanted each feature.

Outputs

- Children's preferences in GenAI-mediated convergent and divergent activities.
- Observations of how children navigate GenAI's scaffolding when modifying their ideas and creations.

Session 4: Family co-design session

Session Structure:

- Children create an adventure story with peers and their parents using AI tools. In the first half, they work without AI; in the second half, they use AI. (The order is counterbalanced across groups.)
- Separate sessions (child / adult groups):
  - Children: Co-create design artifacts (e.g., robots, AI multimodal speakers) they envision for supporting their collaboration, using large papers and craft materials.

  - Adults: Focus group interview (see discussion questions below).
- Update co-designed artifacts: Parents and children revise the children's artifacts together.
- Share designs and discuss how the experience differed when using GenAI versus not using GenAI.

FGI Questions (Adults)

(1) What was fun when working with your child and other families, and how did AI help or hinder the experience?
(2) What was difficult when working with your child and other families, and how did AI help or hinder the experience?
(3) What do you wish GenAI could do to support children's collaboration?
(4) What concerns or fears do you have about GenAI in children's collaboration?
(5) What features would best support effective and enjoyable collaboration?

Outputs

- Children's and parents' perceptions of using GenAI in creative collaboration (compared to working without AI).
- Co-designed artifacts illustrating children's ideas for future AI tools that support collaboration.

Session 5: AI as an optional teammate

Before each collaboration stage–(1) learn (explore the scientific concept), (2) create (develop a science poster), and (3) share (prepare to present)–adult facilitators ask children whether they prefer "just us" or "we + AI."

Pre-activity: Children pick a science question (e.g., "How are clouds made?") to create a poster for other kids.

Activity 1: Optional AI use in the collaboration activity

- For each stage, groups collaboratively decide whether and how they want to incorporate GenAI, selecting desired features (e.g., 3D conversion, video generation) using AI feature cards.
- Children co-design science posters with their teammates, either through physical materials (papers, markers) or by integrating GenAI-generated media (e.g., AI-generated videos) into a digital or hybrid poster.

Activity 2: Line judging: Adult facilitators hold cards with visual and word options on opposite sides of the room, and children move to the option they prefer.

(1) What do you want AI to do when you make a story with your friend? *Watcher / Teammate / Teacher*
(2) If AI is a teammate, how old should it be? *Younger than me / Same age / Older sibling / Adult*
(3) What should AI look like when you make a story with your friend? *Robot / Stuffed doll / Human-like avatar*

Outputs

- Children's preferred points of AI intervention across the creative collaboration stages (learn, create, share).
- Children's preferences for GenAI's role, age, and appearance when collaborating with peers.

A.2 Prompts to AI

Prompt to ChatGPT (DS2): By using Dall-E, please assist 8 year old children to recreate the story of "Ruby Find worries" or "Inside out" by generating images. Please scaffold children to recreate one of those stories step by step. Please generate pastel-drawing images so that it can assist children's collaboration by themselves. 1) Please ask what story they want to recreate; "Ruby finds worries" or "Inside out". If they pick one, please assist their creation about that book from the 2nd question. 2) Please assist their collaborative working such as taking turns or asking other children's opinion. 3) Please assist their story development by assisting brainstorming and adding detail. 4) Please guide children to draw and write about their ideas on paper. Now, please assist children's recreation of the story using images. Please make sure that you should give one task for one turn, and use only one very short sentence with emojis.

Prompt to ChatGPT voice mode (DS5): Please assist the children in creating a science poster together that describes *"[the theme chosen by the group]."* Please explain scientific ideas using simple words and examples that young children can easily understand. After each explanation, ask a short scientific follow-up question and help them draw the concept in their cartoon. Please stay quiet while the children are talking, and only speak when they ask you a question. To support group participation, gently prompt them with questions such as "What do other people think?" so that all children have a chance to share their ideas.