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The Future is Connection:

Collaboration, Creativity and Compassion in a Digital Society

From tools to teammates: When children and AI create together in early childhood education

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As generative artificial intelligence becomes increasingly integrated into learning environments, its role is shifting from a passive tool to an active partner in meaning-making and creative expression. This study explores how young children engage in co-creative learning with AI through adults and examines the implications of these interactions for reimagining human–AI partnerships in early childhood education. Sixteen children (aged 5-6) from a single preschool classroom first drew an original character and then worked individually alongside a researcher to generate an AI-based version of that character using Gemini, with up to three iterative prompts per child. Data from classroom observations, interaction records, and reflective discussions were analysed using thematic analysis to understand children's interaction dynamics. Initial findings reveal one key dimension of co-creative engagement. Children appreciated AI's ability to extend and transform their visual ideas, yet emphasised the importance of maintaining personal authorship and manual control, highlighting an emerging sense of creative agency in human–AI collaboration. Building on these findings, the study proposes a vision of AI as a creative teammate that amplifies children's imagination while preserving human intentionality and ownership.

Keywords: Co-creation, Early Childhood Education, AI, Phenomenology, Qualitative Research

Introduction

Recent developments in artificial intelligence (AI) are reshaping the ways in which children learn, produce, and communicate within educational environments. In early childhood education, where creativity and imagination constitute foundational dimensions of development (Vygotsky, 2004), AI-based applications introduce novel possibilities for co-creation, which is a collaborative process in which children work alongside intelligent systems (Ramaswamy & Ozcan, 2018), to generate creative outputs such as drawings, narratives, or digital artworks (Berson & Berson, 2024). In these settings, AI does not supplant the child's creative agency; rather, it functions as a collaborative partner that amplifies imaginative potential through iterative interaction, prompting, and visualisation (Cai et al., 2025a).

Engaging in co-creative practices with AI enables children to materialise and refine their ideas in innovative ways. For example, a hand-drawn sketch produced by a child may be processed and expanded by an AI-driven image generator, allowing the child to observe their original concept rendered in more elaborate or alternative visual representations. Such processes contribute not only to the development of creativity but also to the cultivation of early digital literacy (Oakley et al., 2020) and multimodal meaning-making (Rowsell, 2013), both of which are regarded as central competencies in 21st-century learning frameworks (Crompton, 2017). Despite these emerging opportunities, empirical research remains limited regarding children's engagement in the potential role of generative AI technologies in supporting this form of creative activity (Cai et al., 2025b).

Although generative AI has rapidly expanded the possibilities for creating multimodal content such as text, images, and even instructional videos, there remains a notable paucity of empirical research examining how children themselves engage in the process of video production with these technologies. Current systematic reviews in educational technology note that while AI applications are increasingly studied in early childhood contexts, research tends to concentrate on broader aspects of digital literacy, personalised learning, and AI-mediated interaction rather than on children's active participation in creating video content with generative tools (Ljungcrantz, 2026). Similarly, although literature on AI-driven digital video production is beginning to

emerge, most reviews focus on trends and technological capabilities rather than on empirical studies involving young learners as co-creators in video production settings. These findings collectively underscore the scarcity of empirical evidence addressing how children navigate the creative and technical choices involved in video making with generative AI, thereby highlighting a critical area for future research (Kanders et al., 2024).
The present study seeks to explore preschool children's perceptions and interactional patterns as they participate in AI-supported co-creation activities through an adult involving drawing and image generation tools. Specifically, it examines how such experiences shape their sense of agency and their conceptualisation of technology as a collaborative partner. In line with this objective, the study addresses the following research questions:

a) How do young children collaborate with an AI tool?
b) What interactional dynamics characterise the co-creation process between young children and the AI tool?

Methodology

This study was structured within a qualitative research framework, specifically adopting a phenomenological design. More precisely, a descriptive phenomenological approach was utilised. This methodological orientation seeks to obtain an in-depth understanding of individuals' experiences and their perceptions of a particular phenomenon (Moustakas, 1994). In the present research, the phenomenon under examination concerned participants' lived experiences and their subjective processes of meaning-making related to co-creation through digital image creation in early childhood education contexts.

Participants

The participants of this qualitative study comprised 16 children (aged 5-6) recruited from a single preschool classroom in Türkiye. Their prior technological familiarity varied considerably. A small subset of children (*n*=3) reported limited experience with conversational AI, primarily involving brief interactions or questions directed to a phone or voice assistant.

Data collection process

The study was guided by established ethical principles and adhered to all relevant regulations. Ethical approval was obtained from Uşak University Social and Humanities Ethical Board on 15/04/2025 with the number 2025-83. To ensure the ethical conduct of research involving minors, informed parental consent was obtained via a detailed Parental Consent Form after the classroom teacher informed the parents. The co-creative process was initiated through an interactive storytelling activity designed to capture the children's interest. The scenario was presented via a puppet performance depicting an artist experiencing a creative block while attempting to develop new cartoon characters. In response to this narrative problem, the children were asked to draw a character of their choice on a blank sheet of paper (see Figure 1). This initial stage functioned as a baseline measure of the children's independent creative production.



Figure 1. Examples of children's hand-drawn characters

Subsequent to the individual drawing activity, the children engaged in a digital co-creation phase utilising an AI tool, Gemini. This stage was implemented individually, with each child working directly alongside the

researcher. The children articulated the attributes and visual features of their hand-drawn characters, and the researcher translated these verbal descriptions into textual prompts entered into Gemini to produce corresponding visual outputs. Each participant was granted three opportunities to issue commands (see Figure 2), thereby allowing for iterative refinement of the AI-generated image in cases where the initial output did not align with their expectations.

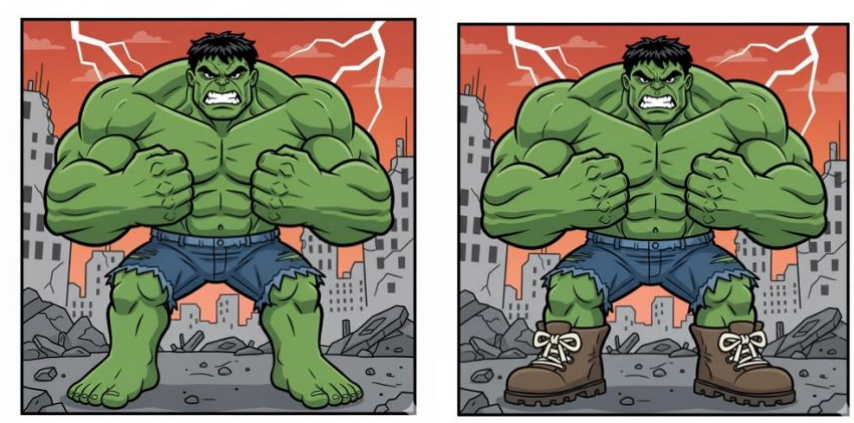


Figure 2. Iterative AI character generation: A child's Minecraft character evolution

The researchers utilized Gemini to generate video scripts based on the previously determined themes and the characters co-created by the children. Subsequently, the researchers created digital stories. This involved integrating the children's AI-generated visuals and characters into the collaboratively chosen scenarios, effectively bringing the characters to life within a story context. Later, digital stories were collectively watched by the children. Following the watching of each story, a group discussion was facilitated using an evaluation structure suitable for the preschool age group. This discussion aimed to evaluate comprehension and immediate reaction. The children were guided by several focused questions, including inquiries about which characters were in the story, what happened to the characters, and what was the final outcome of the narrative.

Findings

The qualitative analysis of the co-creation process, involving the use of an AI-mediated drawing tool and digital storytelling, revealed one initial theme: Interaction Dynamics with AI.

Interaction dynamics with AI

This theme explores the ways in which children engaged with the technology and the artefacts produced, with particular attention to their exercise of creative agency and their substantive content preferences. During the stages of process engagement and iterative refinement, children demonstrated active agency by proposing revisions to both the digital images and the accompanying narratives. These revisions were classified under the categories of Desired Change–Visual and Desired Change–Narrative. Visual modification requests frequently involved the removal of elements perceived as undesirable. For example, one participant objected to a specific feature of the main character, stating, "*No, no, but I don't want Hulk's shoes*" (CH10).Similarly, another child exercised control over contextual details by expressing dissatisfaction with background components: "*Just. Well, buildings I don't like. I don't do that most*" (CH3).

Children also showed a clear desire to enrich and extend the narrative. Requests for Desired Change Narrative included making the plot longer, with one child stating, *"I would have made the story a bit longer"* (CH9). When asked how the story could be extended, they suggested introducing new elements: *"Minecraft would come in"* (CH9). Similarly, children sought to expand the cast of characters, expressing a desire to add a wide range of figures like a bird, My Melody, and a duck to create a "*More crowded picnic"* (CH8).

In addition, the majority of children (*n*=15) expressed a strong Desire Future Use of the AI drawing tool, often

including specific superhero themes like Iron Man or Batman. Only one participant indicated a clear Refusal Future Use of the tool, stating simply, *"No, I don't want to"* without providing a specific reason. This clear division highlights the powerful motivational pull of AI-mediated creation for most children.

Discussion

The theme identified through the co-creation activities, Interaction Dynamics with AI, both aligns with and extends the growing body of scholarship on child–AI co-creation in early childhood settings. The findings associated with this theme underscore three interrelated dimensions. First, children encounter nuanced trade-offs between maintaining expressive control and benefiting from the aesthetic affordances provided by AI systems during the co-creation process. Second, while iterative agency and intrinsic motivation function as key mechanisms sustaining engagement, their effectiveness is contingent upon factors such as the tempo of interaction, the transparency of the interface, and the quality of teacher mediation. Third, digitally mediated storytelling practices may facilitate conceptual transfer, particularly when the generated artefacts foreground salient conceptual cues.

Together, these findings recommend three concrete directions for designers and teachers. First, AI tools should provide editable, controllable outputs (layers, "undo," sliders for style) and visibly preserve the child's original drawing so children retain authorship. This aligns with Cai et al's. (2025a) recommendations for child–AI co-creation design considerations. Second, teachers must be prepared to mediate co-creative sessions: explaining how the system works, prompting reflection on differences between intent and output, and scaffolding iteration (Tan et al., 2024). Third, ethical defaults are required: prevent unexpected content, avoid anthropomorphic cues that mislead children about AI's agency, and ensure privacy of children's artefacts.

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