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Coding as Cultural Expression: Understanding How Children Draw on and Transform Cultural Resources

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Abstract: Creative coding can support children in expressing identity and drawing on everyday cultural experience, but less is known about how this happens in practice or how tools shape it. This poster reports early findings from a culture-themed workshop with Chinese children using OctoStudio. Using screen and audio recordings, project artifacts, and field notes, we found that children incorporated cultural resources through storytelling, imagery, and speech, such as festivals, family roles, dialects, and mythic imagination. These findings frame coding as a culturally situated practice and inform the design of culturally responsive creative learning technologies.

Introduction

Computational literacy, or the ability to use computational thinking, tools, and practices to solve problems and communicate ideas, is widely recognized as an important competency for children (Wing, 2006; Brown, 1992; Papert, 1980). Coding is a key pathway for developing this literacy, yet children's early experiences can be fragile because of abstract concepts, symbolic load, and debugging complexity (Mills et al., 2025). In response, educational research has explored ways to support more meaningful and engaging computational learning (e.g., Silva et al., 2023). Among these, culturally responsive computing (CRC) highlights learners' culture, namely identities, languages, and community practices as resources for learning (Eglash et al., 2013; Scott et al., 2015). While prior work shows the value of connecting computational learning to familiar contexts (Quinn et al., 2025), less is known about how children mobilize cultural resources in creative computing, understood here as coding for the design of expressive artifacts such as stories, animations, and games.

Addressing this gap requires attention not only to inclusive activity design, but also to how children's everyday cultural repertoires, such as language, social roles, traditions, and lived experiences, become part of computational meaning-making. Recent work has increasingly framed computing as a sociocultural activity shaped by learners' lived worlds, yet this research remains largely Western and English-dominant (Arawjo et al., 2019; Roque et al., 2021; Cheung & Ng, 2025; Moraru et al., 2025). In this poster, we examine children's culturally situated creative making with OctoStudio in a Chinese cultural context. Drawing on one session from a series of after-school workshops with elementary-aged children, we analyze their processes, projects, and reflections to show how cultural resources were mobilized through making and how tool affordances and frictions shaped that process.

Method

This study used OctoStudio, a mobile-first creative coding app from the MIT Media Lab that enables children to create interactive stories, animations, and games with coding blocks, photos, sounds, and other media . Its multilingual, low-floor and high-ceiling design, along with support for offline, locally grounded creation, made it suitable for our culture-based creative coding goals (Rusk et al., 2024). We report on one three-hour weekend workshop from a larger series informed by Hofstede's (2010) cultural manifestation framework, focusing on rituals through the theme "A Memorable Event." Ten children in southern Mainland China, aged 8 to 11, participated; seven had prior coding experience and three had none. In three small facilitator-supported groups, children received a 30-minute introduction to OctoStudio's interface and sample projects, brainstormed with sketches and craft materials, and created projects on preinstalled iPads while exchanging ideas with peers and receiving support when needed. The session concluded with project sharing and a focus group.

Data included screen recordings, project artifacts, focus group audio, and facilitator field notes. We analyzed these data inductively to examine how children mobilized cultural elements in their projects and how these expressions were shaped by OctoStudio's affordances and constraints. Two researchers independently coded

the transcripts and artifacts, compared and reconciled their codes through discussion, and refined emerging themes through iterative analysis, which was then reviewed by two additional experienced qualitative researchers to strengthen interpretive rigor.

Preliminary Findings

Across the ten projects on "A Memorable Event," the child participants (identified hereafter as C1 to C10) drew on festivals, family rituals, birthdays, everyday moments, and mythological or historical references. We identified four recurring themes in how they incorporated cultural resources into creative coding.

Incorporating festival and everyday-life narratives. Children often used familiar festivals and everyday scenarios as narrative scaffolds. Spring Festival motifs such as red lanterns, blessings, and red envelopes appeared across multiple projects (e.g., C1, C4), alongside birthdays, family roles, gift exchanges, and natural elements from daily life (e.g., C5, C8). These familiar cultural materials served as emotional anchors for storytelling, though some children also noted the limited availability of backgrounds and animations for representing local events.

Extending mytho-historical imagination. Some children moved beyond everyday experience by drawing on cultural memory, history, and mythology (e.g., C3, C6, C7). For example, C3 combined images, drawings, voice recordings, and motion blocks to create a time-travel story inspired by Romance of the Three Kingdoms and the Dragon King of the East Sea. These projects show how children reinterpreted cultural narratives through personal imagination and computational storytelling, while also revealing limits in the preset asset library for representing mythological or historical figures.

Situating virtual elements in photographed local worlds. Another common pattern was the use of photographed real-life settings as the basis for digital stories. Children captured familiar spaces and objects, then layered drawings, emojis, and code-triggered actions onto those images (e.g., C1, C3, C10). In this way, digital projects remained grounded in recognizable local environments, allowing children to connect interactive storytelling with everyday life and emotionally meaningful places.

Enacting cultural ties through dialect and ritual speech. Voice was another important medium for cultural expression. Children used greetings, blessings, family dialogue, local intonations, and dialect phrases to convey humor, ritual, and intimacy (e.g., C3, C6, C7, C8). These audio elements gave characters personality and made cultural belonging audible, although some children hesitated to record their voices because of shyness or accent awareness (e.g., C1, C2).

Taken together, these findings show that children did not simply add cultural themes as content. They mobilized cultural resources through multimodal creative coding, using the platform to connect lived experience, cultural meaning, and computational expression.

Discussion

The data suggest that children's cultural expression in creative coding was shaped, in part, by the interplay of tool design, facilitation, and learning context. OctoStudio's low-threshold, multimodal, and mobile features enabled children to bring photos, drawings, sounds, and familiar cultural practices into their projects, supporting expression grounded in lived experience. These affordances align with low floor, wide walls, and high ceilings design principles and with minimal computing approaches that emphasize local context and creative agency (Resnick & Silverman, 2005; Rusk et al., 2024). Facilitation also mattered: culture-relevant themes, open-ended prompts, and scaffolding encouraged children to remix everyday and symbolic elements and reflect on their meanings. At the same time, gaps in local languages, artistic styles, and cultural symbols in the asset library revealed a tension between lightweight, accessible design and expressive range, highlighting culturally responsive computing as an ongoing negotiation among inclusivity, simplicity, and creative richness.

The findings also extend the theoretical understanding of culturally responsive computing by showing that cultural expression in coding is not limited to heritage symbols, but emerges through the interplay of technological affordances and children's local meaning-making practices. While prior CRC research has often focused on asset-based design and identity affirmation in Western contexts (Eglash et al., 2013; Scott et al., 2015), our early findings offer an empirically grounded perspective from Chinese children's creative coding. It shows that cultural responsiveness operates not only through explicit cultural representation, but also through hybrid practices that combine everyday, mytho-historical, and vernacular resources to make computation personally and locally meaningful. This finding broadens CRC by foregrounding culture as fluid and negotiated rather than fixed, and suggests that CRC design in non-Western and non-English settings should better support multimodal and multilingual mediation, such as voice, imagery, and gesture. In this sense, CRC is co-constructed through children's creative negotiation of local worlds and digital technologies, in line with culturally sustaining approaches to learning (Paris & Alim, 2017).

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