



TogetherTales RPG: Prosocial Skill Development Through Digitally Mediated Collaborative Role-Playing

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ABSTRACT

"TogetherTales RPG" is an augmented reality (AR) platform designed for children aged 4 to 6, aiming to foster prosocial behavior through interactive and collaborative role-playing. *TogetherTales RPG* is inspired by children's design ideas related to technology supported social inclusion and prosocial skill development, a theme prevalent in children's submissions in light of pandemic socialization restrictions. *TogetherTales RPG* integrates classic tabletop role-playing game mechanics with advanced AI and AR technologies to immerse children in a narrative-driven world where their personalized avatars interact with virtual elements and collaborate with peers to solve challenges. This blend of imaginative role-play and real-world social interaction facilitates prosocial skill development in a fun, engaging, and developmentally appropriate way.

CCS CONCEPTS

• **Human-centered computing** → **Interface design prototyping**.

KEYWORDS

Child computer interaction, Prosocial skill development, Augmented reality, AI, Narrative-based play, Social emotional learning

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1 INTRODUCTION

In our team's analysis of children's submissions to the IDC research and design challenge, we noted a prominent theme: the use of interactive devices to detect social exclusion and foster peer participation and engagement. Notable examples of this theme include design

ideas such as the "Play With Me Watch", "The Friend Finder", "Globo", and "CookiesForAll". Social inclusion and prosocial behaviors are key competencies children develop throughout early childhood and late adolescence. The CASEL framework for social-emotional skills labels these competencies as "social awareness," the ability to understand the perspectives of and empathize with others, including those from diverse backgrounds, cultures, and contexts, and "relationship skills," the ability to establish and maintain healthy and supportive relationships and to navigate settings with diverse individuals and groups effectively [16]. Research has shown that the COVID-19 pandemic impacted children's opportunities to develop social awareness and relationship skills as lockdowns and social distancing measures limited daily socialization experiences and play with other children [8, 13, 15]. Young children (ages 4-6) who would typically be starting to attend structured socialization environments like play and learn groups or school were impacted by the pandemic at a pivotal point in their development. In early childhood, socialization with peers through play offers a safe context for children to explore new skills, negotiate social roles, recognize and respond to their own and others' feelings, share, follow rules, and resolve conflicts [6]. Given the importance of developing prosocial behaviors in early childhood and the impact COVID-19 may have had on their development, it is crucial to provide young children with supported opportunities to foster social awareness and relationship skills.

2 IDEATION

The prominent theme in children's ideas of social inclusion, paired with research on how COVID-19 has impacted social awareness and relationship skill development for children [8, 13, 15], motivated our team to ideate interactive technology solutions that could scaffold developmentally appropriate prosocial skill development for young children (ages 4-6). This design process involved (a) identifying the specific prosocial skills that 4-6-year-olds are developmentally ready to learn and (b) determining the activities, environments, and tools that can facilitate the development of these skills.

Prosocial Skill Development for 4-6 Year Olds. During the ages of 4-6, children are at a pivotal stage of social and emotional development. The CASEL framework [16] and state standards [1, 2, 18] for young children provide a comprehensive guide to understanding the nuances of prosocial skills appropriate for this age group.

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For example, recognizing and understanding emotions is a key aspect of their development, often requiring adult guidance [5, 18]. Children also develop relationship skills, including listening attentively, developing and maintaining friendships, communicating positively, and resolving conflicts [1]. These foundational competencies are crucial as they begin to initiate prosocial behaviors that foster friendships and connections. We distilled these competencies into five key skills presented in kid-friendly language: “Knows Emotions,” “Makes Friends,” “Listens to Friends,” “Shares Ideas,” and “Solves Problems.”

Activities, Environments, and Tools That Support Prosocial Skill Development. Collaborative, creative, and dramatic play, particularly imaginative role-playing, holds promise as a channel for fostering prosocial skill development [10, 14]. Activities like structured arts and tabletop role-playing games (TTRPG) can promote prosocial behaviors by providing dynamic avenues for children to practice creativity and relationship development [12, 22]. Similarly, interactive experiences in settings like children’s museums play a critical role in reinforcing these competencies, highlighting the importance of thoughtfully designed play environments in supporting prosocial skill development [17]. Digital technologies offer unique opportunities to promote and enhance children’s collaborative and creative play. For example, technology can help children turn their drawings into immersive projections [4, 19]; build story narratives [7, 20, 21]; and engage in creative role play [3, 11]. However, technologies intentionally developed to promote social and emotional learning are underexplored [9], especially through collaborative play. Our aim was to create a tool that leverages creative role play with digital technologies to support children’s prosocial skill development in group settings.

3 PROTOTYPING

We synthesized the above research and recommendations into key design considerations (see Table 1) to inform our prototyping process. During prototyping, with these design considerations in mind, we found that tabletop role-playing games (TTRPGs) may be a good solution. TTRPGs are inherently collaborative, with players working together to accomplish goals through a shared “theater of the mind.” TTRPGs have been used to foster social skill development in therapeutic contexts, particularly for older adolescent children [12]. We decided to use *Dungeons and Dragons* as a base intervention example to inform the design of our digitally-mediated, prosocial skill development-focused, role-playing game for 4-6-year-olds.

4 DESIGN SOLUTION: TogetherTales RPG

TogetherTales RPG is an AR experience for young children that engages them in immersive narrative play. Based on character sheets generated by players, *TogetherTales RPG* crafts unique narratives for each character and projects a digital environment within which children interact with virtual elements and their peers, blending imaginative role-play with real-world social interaction. Our technological framework includes ARKit, Apple’s augmented reality platform, which manages rendering 3D graphics in the user’s environment. We also utilize machine learning-based pose estimation

libraries to capture and interpret children’s poses in real-time, eliminating the need for handheld controllers. Lastly, we use RealityKit for rendering, animation, and audio, enabling the creation of life-like and responsive 3D characters and environments. Hosted on an iPad, the experience will be projected onto physical spaces, such as classroom walls, using either projection mapping or by utilizing AirPlay to mirror the content on larger screens via Apple TV.

Character Sheets. Children will first build a character using character sheets (see Figure 1), inviting them to showcase their creativity and engage with the prosocial skills they will develop during gameplay. Children will draw their character, articulate salient features of their character (e.g., favorite accessory), and align their character’s traits with key prosocial skills (knows emotions, makes friends, listens to friends, shares ideas, and solves problems). Below each prosocial skill, there is a colored circle that corresponds to a bar with the same color at the bottom of the sheet. Children will quantify their character’s skills by coloring in the bar to represent how strong each trait is. The character profiles will be scanned into the *TogetherTales RPG* system, which utilizes image recognition software to accurately interpret the extent of the colored bars. The data will then be translated into a numerical or descriptive format for OpenAI’s GPT-4 to process.

Narrative Generation & Collaborative Play. We will fine-tune the GPT-4 model with datasets rich in age-appropriate interactive storytelling, role-playing scenarios, and game-oriented narratives. The model, once fine-tuned, will utilize the social skills chart from the children’s character sheets as input to generate each character’s attributes, background, and narrative paths for the game. Drawing on TTRPG mechanics, *TogetherTales RPG* places AI in the role of adaptive “Game Master”, crafting narrative adventures specifically designed to scaffold children through exercises that develop five key prosocial skills. This AI-driven environment simulates dynamic scenarios where children must navigate challenges that require the use of these skills. For instance, the AI might create a storyline where children need to identify and manage their emotions to proceed, work together to solve a puzzle, share ideas to overcome an obstacle, or negotiate to resolve conflicts. This approach ensures that gameplay is engaging and gradually builds children’s prosocial competencies in a supportive, interactive setting. RealityKit will facilitate the implementation of physics and game logic, enabling the characters to respond to various scenarios in the game dynamically. Digitized drawings from the character sheets will be integrated into the game environment. This approach adds a personal touch to the learning experience and promotes inclusivity, allowing children to create avatars that best represent themselves.

Other System Components. To ensure that the narratives and challenges developed by the AI model are age-appropriate, *TogetherTales RPG* includes a caregiver dashboard, designed for both educators and family members. The dashboard contains features that allow caregivers to modify and approve content before its implementation in the game, provide feedback on game content and narrative direction, monitor children’s social and emotional learning competencies, such as teamwork, empathy, decision-making, and conflict resolution. The system translates raw gameplay data into actionable

Design Consideration	Details
Age-Appropriate Social Awareness and Relationship Skills	Know Emotions, Makes Friends, Listens to Friends, Shares Ideas, Solves Problems
Activities, Environments, and Tools That Support Prosocial Skill Development	Storytelling, Dramatic Play, Collaborative Art Projects, RPGs, Guided Inquiry (prompts, scaffolds and explanations) supports curiosity and creativity
Use of Digital Tools to Foster Prosocial Skills	Digital tools supporting familiar play, Drawing, Storytelling
Considerations Around Technology and Young Children	Dexterity, Attention, Privacy, Screen Time, Facilitates peer-to-peer interaction

Table 1: Key Design Considerations for Developing a Digitally-Mediated, Prosocial Role-Playing Game for Children

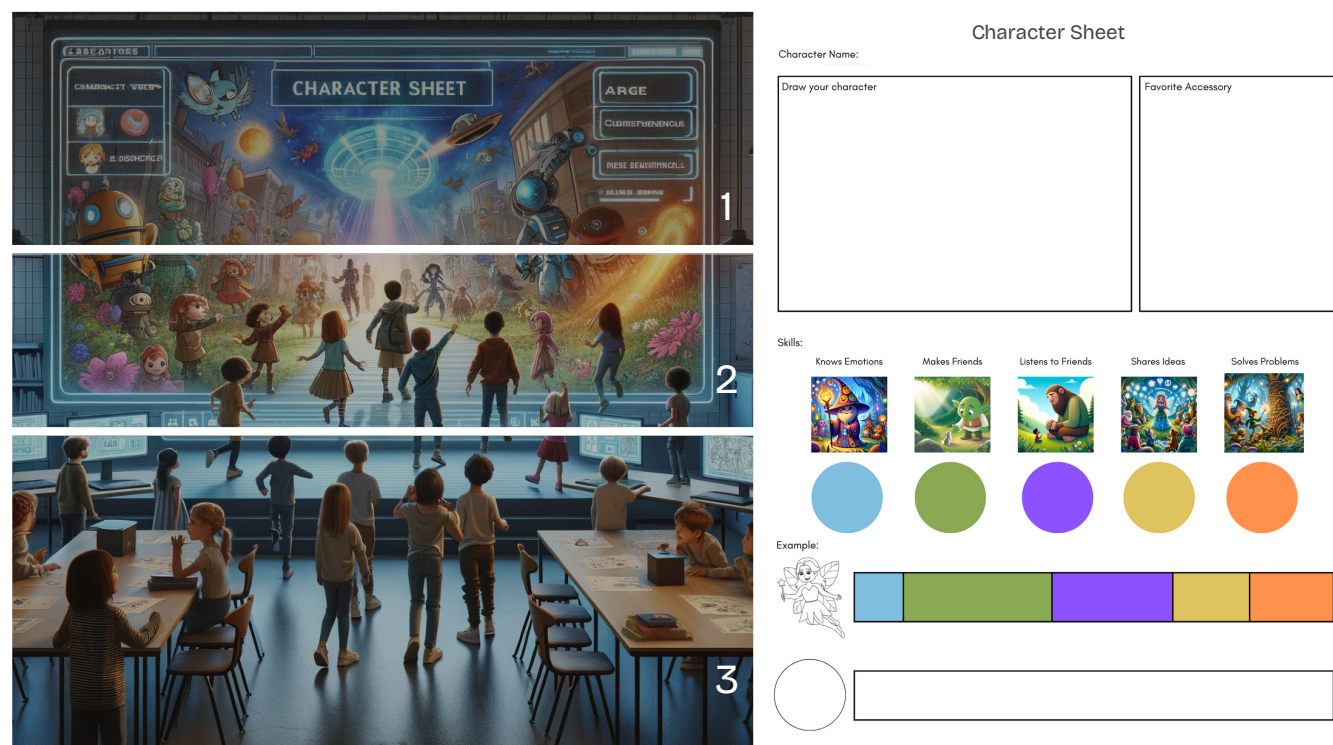


Figure 1: TogetherTales RPG engages children in a creative process where they use character sheets to draw and assign five social-emotional traits to their characters ③, which are key to prosocial interactions during gameplay. The GPT-4 model takes the customized character sheets to craft unique, personalized narratives. Characters are brought to life in an augmented reality setting for the children to interact with ①. In the physical space, children engage with the augmented experience, collaborate with peers, and solve challenges presented within the narrative, enhancing their social and emotional learning ②.

insights, simplifying the process for caregivers to interpret and utilize the children's data. Additionally, the caregiver dashboard offers post-game reflection tools, which support caregivers in initiating discussions about the emotions, experiences, and social dynamics encountered during gameplay.

5 FUTURE WORKS

We propose a structured playtesting phase involving small groups of children within our target age range. Each session will introduce

participants to the game environment and data will be collected on prosocial skill development during gameplay. Observations will be recorded on how children utilize key skills during play. Pre- and post-session focus groups will be conducted with participants and caregivers to gauge changes in understanding and application of social-emotional concepts. Successful implementation and positive results from this phase will guide future enhancements and wider deployment of the system.

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