Exploring the Learning by Teaching Paradigm with Social Robots

Exploratory Studies on Learning by Teaching with Social Robots using Wizard-of-Oz Control

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What happens when children teach a robot?

This project explores how **children** develop social understanding by **teaching a robot** to behave appropriately in **shared activities**.
Rather than programming or controlling the robot directly, children engage in a **Learning by Teaching** process, shaping the robot's behaviour through interaction, correction, and feedback.

Goals

Develop a socially expressive Wizard-of-Oz dashboard for intuitive robot control in child-robot interaction.

Explore how children teach and shape robot behaviour in collaborative scenarios, to inform future autonomous systems.

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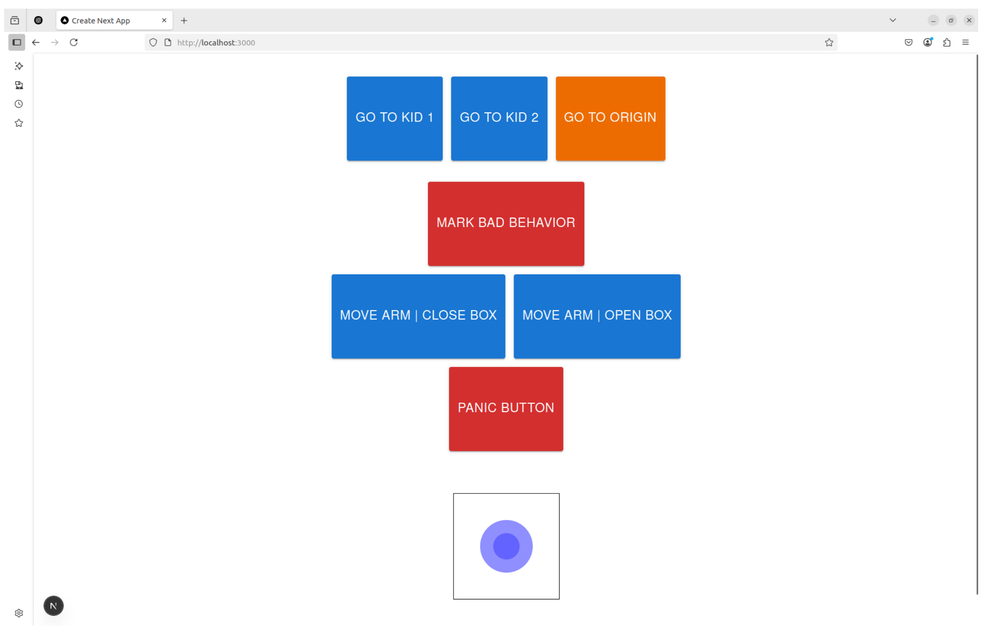


Fixed positions didn't work

Children moved unpredictably during play, making joystick control a must.

Negative Feedback Was Entertaining

Spinning or dramatic motions were perceived as fun, potentially reinforcing misbehaviour.

Robot Seen as a Peer

Participants related to the robot more like a peer or playful companion than an authority figure.

LEDs Were Ignored

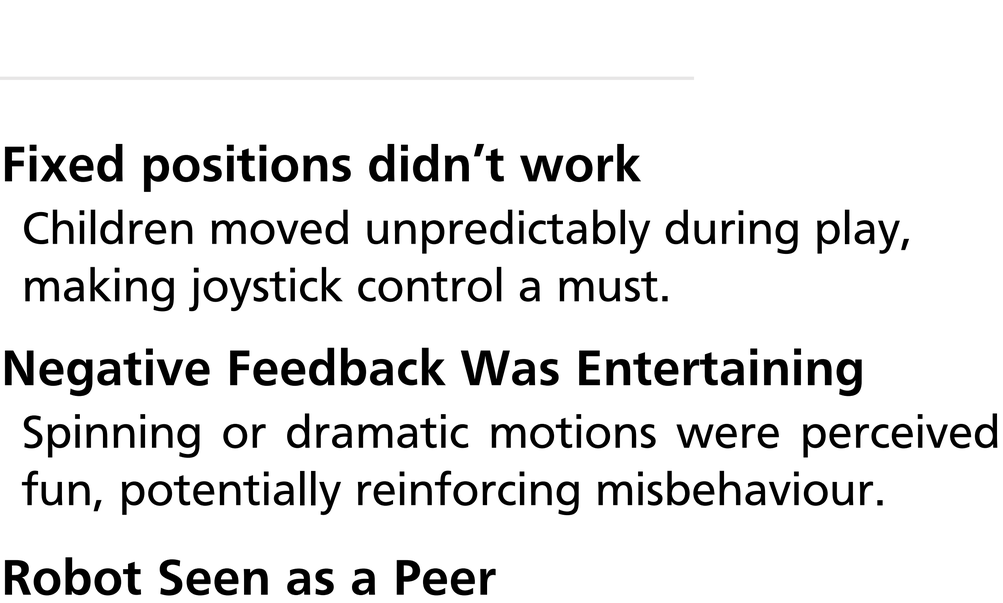
Red light alone wasn't enough to attract attention during play, especially on the floor.

Movement Was Attention-Grabbing

Quick approaches or changes in position effectively caught children's focus.

Naming Boosted the Engagement

Letting children name the robot increased their sense of connection and interaction quality.



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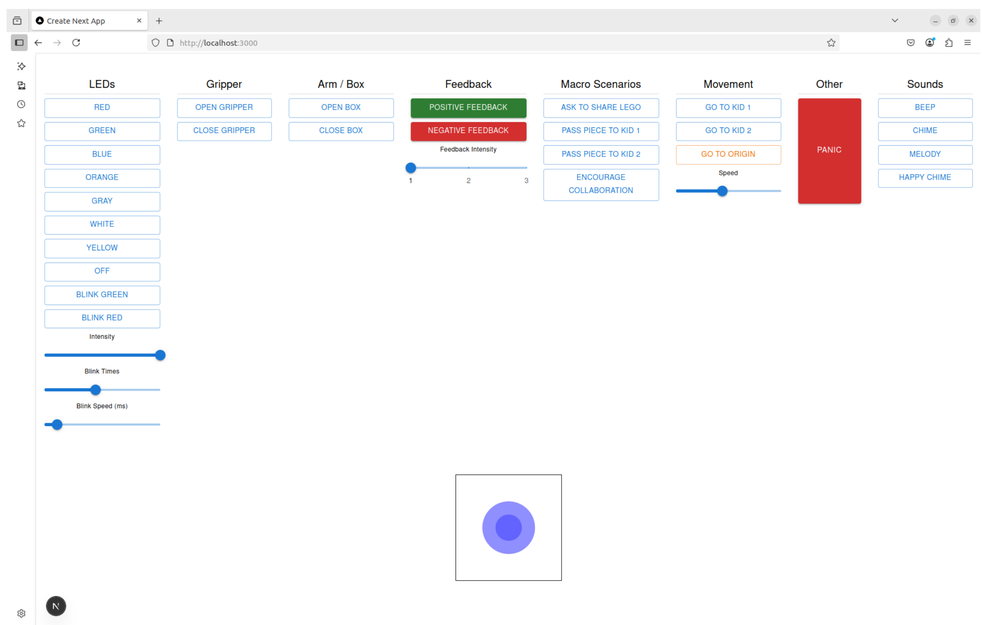

Robot Seen as a Pet

Children treated the robot like a pet (e.g., decorating or petting it), reinforcing its peer-like framing.

Multimodal "Dances" Were Popular

Children loved expressive combination of lights, sound, and movement for positive feedback.

Emotion and Politeness Teaching Emerged

Kids naturally started to teach the robot social behaviours like keeping distance or expressing emotion.

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Conclusions

Children engaged more with a robot framed as a peer. The co-design process helped shape both the interface and its expressive behaviours to align with this framing.

Future work

Next steps include enabling emotion-aware autonomy and expanding the approach to broader, more diverse child populations through longer-term studies.