Development, Deployment and Evaluation of Personalized Learning Companion Robots for Early Literacy and Language Learning , Poster #106

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Key Problems

P1: 1/3 of American children do not reach basic levels of literacy, and 2/3 fail to reach proficiency, impacting access to STEM careers.

➔ Early childhood is the most critical and cost-effective time to intervene.

P2: Intelligent tutoring systems support knowledge acquisition, but do not support social and emotional learning needs of young children.

➔ Peer-like social robot intervention that can engage and personalize to young children's cognitive, social, and emotional learning needs could dramatically improve school readiness.

Impact #1: Long-term Personalized Story Companion

- Automatic **Reading Skill Assessment** and Learning **Content Personalization**

- **Personalizing Robot non-verbal and verbal behavior t**o Maximize Engagement

- Reliable, Robust, Affordable **Robot Platform + ed games for long-term, real-world deployments in K classrooms**

16 Jibo stations deployed in Atlanta, GA schools

Question Proposal

Verbal & Non-verbal

Training Data

Impact #2: Contextually Grounded NLU for Dialogic Q&A

- Accounting for child engagement and cognitive state in **question timing**
- Contextually grounded dynamic **question generation** during dialogic storytelling
- **Novel corpus** of disfluency annotated child speech and questions designed for spoken conversations

txt/audio Time Alignment

Impact #3: Robust Child Automatic Speech Recognition (ASR)

Real-time ASR

- **Engaging speech collection protocol** administered by a social robot
- Analyses and development of effective **child ASR**
- **Novel longitudinal corpus** of child speech (200hrs)

Training Data