Inclusive Design for Engaging All Learners (IDEAL): Designing Technology for Cultural Brokering

Societal Needs:

- Language minority children typically struggle academically and socially because of their developing English skills and consistently score lower than their native English-speaking peers in all subject areas (Kena et al., 2015).
- Viewing the children as deficient in language, social, and academic skills marginalizes them, which negatively affects their identity and contributes to their disengagement from schooling. (Valencia, 2010).
- The early school years are an especially critical period when children are first exposed to academic English and also when they start developing their identities as learners. There is an urgent need for early intervention to re-position the children as valuable contributors to the classroom learning community.

Research Goals:

- We view English-learning students as a culturally and linguistically diverse group who can enrich the mainstream school culture with their cultural and linguistic assets.
- We envision technology that serves as a cultural broker, helping all learners to expand the boundaries of their intellectual, social, and cultural communities and feel included as valuable participants in a classroom learning community.
- We design robot-mediated collaboration activities between native English-speaking (ES) and English-learning (EL) children, where both children are invited to learn from each other and to learn to interact in equitable ways.

A Cultural Brokering Framework

Immediate Outcomes:

1. Developing collaboration skills thru:
   - Building common ground;
   - Developing coordinated meaning;
   - Building an equitable, empathetic partnership;
   - Building a co-cultural schema.

Long-Term Outcomes:

1. Regardless of children’s cultural and linguistic backgrounds, all children will:
   - Build equitable friendships;
   - Develop positive identities as learners;
   - Learn the topic meaningfully.

The figure above represents a theoretical framework for cultural brokering. In a framework of invitation, empathy and opportunity, an embodied robot helps children develop communication skills that is crucial for equitable collaboration. Through repeated participation in a triadic learning community of robot, EL children, and ES children, all the children gradually build respectful friendships and construct positive learner identities.

Methods:

- A class of 24 kindergarteners is divided into twelve pairs. In a socio-technical triad of robot and two children, each pair works together to help the robot, Skusie, learn about life on Earth.
- Activities address a wide range of topics including birthday parties and being the new kid in school.
- Each interaction activity focuses on one communication goal while incorporating several Common Core standards for kindergartners.
- Ethnographic observations are employed using a “Wizard of Oz” method in which a researcher controls the robot from afar.
- In an iterative cycle of design and observation, robot/children interaction sessions are videotaped, transcribed, and analyzed in order to continuously refine the robot mediated activities.

Expected Outcomes:

- Understanding of critical variables involved in designing robot mediation and the conditions that support children’s positive outcomes.
- Children will develop collaboration skills, positive learner identities, and learning gains.

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