Telepresence Robot Design Recommendations for Supporting Inclusion in Schools

Telepresence robots offer exciting possibilities for fostering inclusion in educational settings. By allowing students who are unable to be physically present in the classroom to participate remotely, these robots can bridge geographical distances and overcome physical limitations. However, to maximize their effectiveness in promoting inclusivity, careful consideration needs to be given to the design of these robots. This report outlines key recommendations for telepresence robot design that enhance accessibility, social interaction, and overall user experience in schools.

InClass

1. Accessibility and Ease of Use

- **Intuitive Interface:** The robot control interface should be user-friendly and accessible for students of all ages and abilities. This includes features like:

  - **Simple navigation controls** that are easy to understand and operate, even for younger children or students with motor skill limitations.

  - **Text-to-speech and speech-to-text functionality** to cater to students with visual or auditory impairments.

  - **Compatibility with assistive technologies** (e.g., screen readers, joysticks) to ensure everyone can participate regardless of their abilities.

- **Clear Visual Cues:** Utilize clear and prominent visual indicators on the robot's body and interface to provide feedback to the remote user, such as battery level, connection status, and movement direction.

- **Audio Cues:** Employ audio cues alongside visual indicators, especially for students with visual impairments, to enhance situational awareness and user experience.

2. Design for Social Interaction

- **Eye-Level Camera Placement:** Position the primary camera at approximately eye level to facilitate natural and engaging interaction between the remote user and classmates/teachers. This fosters a sense of connection and reduces the feeling of detachment for the remote participant.

- **Multiple Camera Options:** Consider including additional cameras on the robot, such as a wide-angle view or a downward-facing camera, to provide the remote user with a more comprehensive view of the classroom environment and activities.

- **High-Quality Audio System:** Employ high-fidelity speakers and microphones to ensure clear and crisp audio communication between the remote user and the classroom. This facilitates seamless conversation flow and minimizes potential misunderstandings.

- **Body Language Features:** Explore potential for the robot to exhibit basic body language cues (e.g., tilting its head to show interest) to enhance non-verbal communication and further improve social interaction.

3. User Experience and Comfort

- **Ergonomic Design:** Ensure the robot's design promotes comfortable and prolonged use by the remote student. This includes factors like adjustable screen angles, intuitive control placement, and a stable base for avoiding unintended movement.

- **Adjustable Height:** Equip the robot with adjustable height capabilities to allow the remote user to interact at eye level with classmates/teachers regardless of their seating or standing positions.

- **Noise Reduction Features:** Implement noise-canceling technology in the robot's microphones to minimize background noise distractions for both the remote user and classroom participants.

- **Safety Features:** Integrate safety features like automatic obstacle detection and avoidance to prevent collisions and ensure safe navigation within the classroom environment.

4. Additional Considerations

- **Privacy and Security:** Implement robust security measures to safeguard student privacy and protect sensitive data transmitted through the robot.

- **Durability and Maintenance:** Design the robot for durability and ease of maintenance in a school environment. This includes features like shock absorption, easily replaceable parts, and long-lasting batteries.

- **Scalability and Adaptability:** Consider the potential for future upgrades and adaptability to accommodate evolving educational needs and advancements in telepresence technology.

- **Aesthetics and Appeal:** Create a visually appealing robot design that is engaging and age-appropriate for students, promoting a positive user experience.

By incorporating these recommendations, telepresence robot designers can create robots that are truly inclusive, allowing all students, regardless of location or ability, to participate fully in the educational experience and foster meaningful social connections within the classroom environment.