Telepresence Robots

Establishing Digital Empathy

ABOUT US

The InClass project is dedicated to facilitating the classroom participation of children facing health issues by the incorporation of telepresence robots. Members of Leuphana University Lüneburg accompanied a student in a Hamburg secondary school who remotely attended classes through a Double 2 robot. Additionally, a lab study was conducted, exploring digital empathy in human–robot interactions through the assessment of telerobotic pilots. Moreover, members of the HRI Lab at the University of Southern Denmark experimented with empathy eliciting interventions.

CONTENT

WHAT ARE TELEPRESENCE ROBOTS?

A telepresence robot is a remotely controlled mobile device equipped with audiovisual capabilities that enables users to interact and participate in a distant location. In the present case, an 8th grade student from Hamburg was supported by a Double 2 robot over a 6-month period while she was undergoing chemotherapy.


This approach demonstrated distinct advantages over conventional video conference tools. It facilitated both group work and one-on-one interactions, enabling a dynamic and engaging learning experience. Through the improved mobility and freedom, the student enjoyed a newfound independence in navigating the school environment. She reported a remarkably positive experience, highlighting the robots' role in enhancing presence and social interactions. From the onset, the robot was individualized, and became an extension of the student. This personification extended to classmates, who embraced and interacted with it. This case exemplifies the positive impact of telepresence robots not only as an educational tool but as a means of empowerment and inclusivity. However, research suggests that remote students joining interactions via a telepresence robot can be perceived less favorably than their physically present classmates (Stoll et al., 2018). This can lead to feelings of

isolation and exclusion for remote students, and hinder their overall learning experience.

One potential way to address this issue is by fostering empathy among participants in mediated communication. In the context of robot-mediated communication, empathy can help to bridge the physical gap between remote and physically present participants, and create a more inclusive and supportive learning environment (Asadi et al., 2023).

WHAT IS DIGITAL EMPATHY?

Empathy is the profound ability to identify with and understand other people's feelings, situations, and experiences. It involves feeling sympathy and compassion for others' suffering and being attuned to the emotional aspects of human interaction (Jiang & Gao, 2020, pp. 71-72). Understanding and practicing empathy is a crucial skill in the digital age, especially for educators and students navigating online learning (Pérez, Santos, Delgado & Buzón-García, 2016, pp. 1-2).
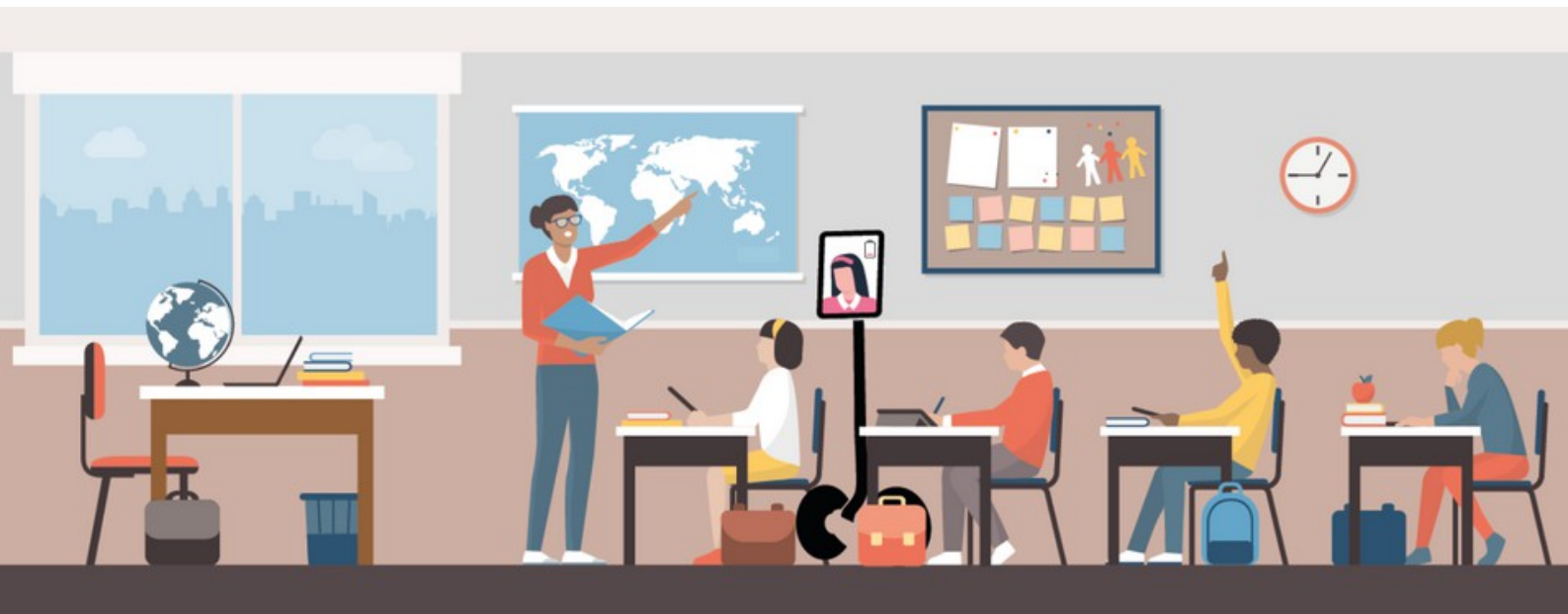
Digital Empathy is an extension of empathy into the realm of digital media. It encompasses the mental and emotional capacity to navigate the vast landscape of digital platforms while remaining thoughtful and socially

conscious. It refers to how we approach and engage with others online, demonstrating empathy through our actions and interactions in the digital realm (Chen, 2018, p. 51).

WHAT CHALLENGES COME ALONG WITH DIGITAL EMPATHY?

In the digital landscape, the absence of face-to-face feedback and non- verbal cues can make it challenging to fully comprehend others' emotions, which can result in misinterpretations, misunderstandings and a diminished sense of empathy (Terry & Cain, 2016, pp. 1-2). Navigating the online world poses unique challenges for students, teachers and parents, particularly in fostering empathetic communication.
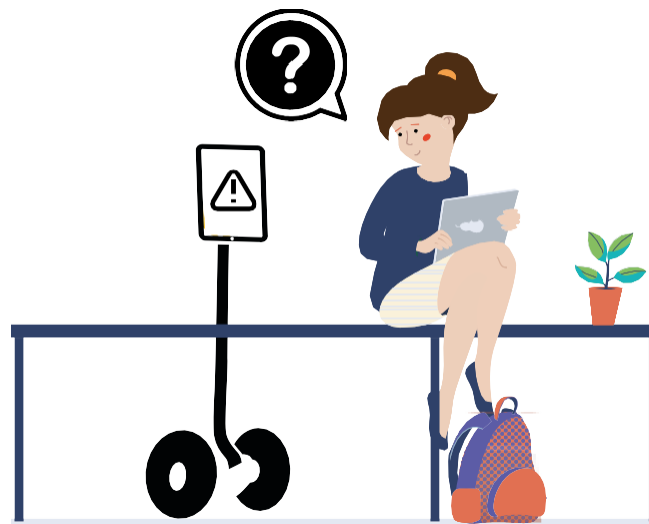
The case study conducted in Hamburg highlights various challenges, such as internet connectivity issues, limitations in physical activities, and logistical hurdles related to documents, when employing telepresence robots. Despite these obstacles, the study underscores the potential success of telepresence and digital empathy. Additionally, the lab study performed at Leuphana University assessing digital empathy in human- robot interactions found that telepresence robots do not necessarily elicit lower empathy levels than in person communication. Cultivating digital empathy involves adapting traditional empathetic skills to the online environment. Incorporating the following strategies into the digital learning environment can help students, teachers and parents to establish meaningful connections, enhance understanding and contribute to a more empathetic digital culture.

A recent study by Asadi and Fischer (2023) investigated the effects of an empathy-eliciting intervention on the perception of telepresence robot users. The study involved 30 participants who engaged in a language learning activity in groups of

three, with one participant joining the group via a telepresence robot. The researchers found that after the empathy-eliciting intervention, participants rated the telepresence robot user as significantly more trustworthy, reliable, and interested in art, music, or literature. These findings suggest that even a simple intervention designed to elicit empathy can have a positive impact on the way remote participants are perceived in mediated communication settings.

In another study, Asadi et al. (2023) investigated how a social robot moderator, by asking a simple empathy-eliciting question, can significantly improve how people perceive each other in telepresence settings. The findings suggest that after the robot's intervention, participants physically present in the room (collocated participants) viewed those joining remotely (telepresence participants) as more trustworthy, emotionally stable (less tense, irritable, and shy), and agreeable (less likely to find fault with others). These positive changes align with core personality traits from the Big Five model: neuroticism-emotional stability, agreeableness, and trust. Interestingly, the study also revealed a two-way street effect. Telepresence participants also perceived collocated participants more positively after the robot's intervention. They judged them as more trusting, outgoing, and less tense. However, they rated them slightly lower on being thorough.

Overall, this study provides strong evidence for the power of empathy in fostering positive social interactions, even when mediated by technology like telepresence robots. By simply prompting participants to consider each other's perspectives, a robot moderator can significantly improve trust, emotional comfort, and overall perception within these interactions.

Social and Virtual Inclusion of Remote Students

In addition to fostering empathy, it is also important to consider the social and virtual inclusion of remote students in educational settings. Social inclusion refers to the sense of belonging and connectedness that remote students feel within the classroom environment. Virtual inclusion refers to the ability of remote students to participate fully in classroom activities and interact with their peers and teachers (Newhart et al., 2016).

There are a number of ways to promote social and virtual inclusion for remote students. These include:

- Using collaborative learning tools and platforms: These tools can allow remote students to work together on projects and assignments with their classmates, even when they are not physically present in the same location.
- Encouraging peer interaction: Teachers can create opportunities for remote students to interact with their peers, such as through online discussion forums or video conferencing.
- Providing training and support for teachers: Teachers need to be trained on how to effectively use technology to include remote students in classroom activities.

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TIPS FOR STUDENTS

Practice Respectful Communication:

Engage in conversations with the digitally present student with undivided attention, reflecting on the words shared, and responding thoughtfully. Express curiosity by asking questions or actively engaging with the content shared by classmates. Use positive language, be mindful of others' feelings, and avoid engaging in behaviour that may be hurtful. Understand that there might be technical issues and be patient to allow your peers to express themselves without interruption.

Cultivate Self-Awareness and Create an Inclusive Environment:

Actively include students using a telepresence robot in conversations and group activities to create a positive atmosphere where everyone can feel included and valued. Make sure to include the digitally present student in small talk and activities during breaks. Reflect on your own emotions and their potential impact on online interactions. The case study has shown that being considerate of the special circumstances can contribute to a better working atmosphere: "Yes, they have all become quieter and a bit more caring. [...] that's a bit more pleasant for the class and for the teachers too and a bit quieter, a bit better working atmosphere."

Provide Support and Encouragement:

Offer support when needed. If your classmate with the robot faces any challenges, be ready to assist in a helpful and non-patronizing way. This may involve carrying the robot up and down stairs, opening doors, or helping when technical issues arise. Everyone has individual needs and preferences, therefore you should directly communicate with the person using the telepresence robot to find out how to support them best. Most importantly, be respectful and open-minded.

TIPS FOR TEACHERS

Understand Individual Needs:

Recognize and accommodate the unique learning needs and circumstances of each student in the digital environment. Offer assistance and words of encouragement to those facing challenges. Implement engagement strategies that involve the remote student in the class discussion and plan group activities that allow them to actively participate.

Cultivate a Positive Online Environment:

Recognize and commend empathetic actions to encourage the continuation of positive behaviours. Foster a supportive and positive atmosphere by encouraging open communication, celebrating achievements, and providing constructive feedback. Try to show your students that you appreciate their presence via the robot. The student from Hamburg highlighted: "They all think it's great, my physics teacher took a selfie with me and my robot last time. They all think it's great that I'm back and that I can be quite present."

Technical Familiarity and Thoughtful Technology Use:

Be mindful of potential challenges, and choose tools that are user-friendly and accessible. It is important that teachers are familiar with the operation of telepresence robots and that the schools' infrastructure is good enough to ensure consistent and reliable connectivity. Be open to the technology and understand that occasional technical issues may arise. The remote student's classmates may actually be ready to help with the technology. Having contingency plans or alternative activities in case of disruptions can help maintain the flow of class.

Moderating the Interaction

A study by Asadi and Fischer (2024) investigated whether a moderator could improve the sense of social inclusion for remote participants joining group activities via a telepresence robot. The experiment involved 84 participants divided into groups of three, with one member joining remotely. Groups either interacted with a social robot moderator providing instructions and prompts, or completed the task with text-based instructions only.

The findings suggest that moderation positively impacted physical proximity between participants, especially for the remote member. In the moderated condition, the remote participant stood significantly closer to a physically present member compared to the non-moderated condition. Additionally, most participants in the moderated condition stood up and interacted at eye-level with the remote member, while most remained seated in the non-moderated condition.

These results imply that moderation may foster a more comfortable and inclusive environment for remote participants. Thus, the teacher actually plays an important role in facilitating inclusion in the classroom, by asking questions about the difficulties the remote child is experiencing, and by allocating turns in a balanced fashion.

TIPS FOR PARENTS

Active Engagement and Communication:

Actively engage with your children in digital spaces, ask open-ended questions about their online experiences, and maintain open communication to understand their feelings and challenges. Demonstrate positive digital citizenship by modelling empathetic and respectful online behaviour. Showcase the importance of understanding diverse perspectives and treating others with kindness in the digital realm. Support your children's online activities by providing guidance on responsible technology use, addressing any concerns they may have, and offering assistance when needed to create a safe and enjoyable digital environment.

Provide Privacy and Respect Boundaries:

Ensure that your child has a private space for using the telepresence robot. Having parents in the background may be distracting for both teachers and students. It is important to respect the closed nature of the digital session and to ensure uninterrupted learning time; for instance, the remote student's mother said: "I think you also attach great importance to it, and we also totally respect that the door is closed, she is then really gone. I think you also don't want us to come in here and talk or listen [...], that's really such a closed unit for her. You go to school."

Encourage Independence and Autonomy:

Empower your child to take ownership of their experience with the telepresence robot. Foster a sense of independence by allowing them to handle routine tasks, troubleshoot minor technical issues, and communicate with teachers autonomously. Provide guidance when necessary, but encourage them to develop the skills and confidence to navigate their telepresence environment on their own. Collaborate with educators to strike a balance between support and autonomy.

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PROJECT PARTNERS

InClass is an EU-funded project coordinated by University of Southern Denmark with 7 partners including universities and research centers from all over Europe.

Our goal is to help children with health issues attend and integrate into their classrooms by means of telepresence robots.

Another goal is to understand how telepresence robots can stimulate innovative learning and teaching practices that allow for collaborative online international learning in the classroom.