

Robotic Telepresence in the Classroom and Values

Research Area

Researchers have identified a correlation between the frequency of students' interaction with their school environment, and students' motivation and engagement levels [1, 2]. Students who physically attend classes and interact with their classmates, instructors and the school environment tend to be more behaviorally, emotionally, and cognitively ready to be involved in the classroom activities and the learning process.

Unfortunately, some students do not attend classes due to illness, injury and/or physical disability (temporary or chronic). Different universities have made some efforts to provide instruction for students with disabilities through home tutoring, online courses, and video conferencing. However, such solutions do not offer the same experience a student needs and gains while being in the classroom environment, such as direct classroom participation and interaction.

The use of telepresence robots appears promising in domains such as office work [6-9] and attending conferences [3]. However they are understudied in educational settings [4, 5]. Robotic telepresence has the potential of alleviating the problem of inaccessibility for students with disabilities and attenuating its limitations. Telepresence robots may allow for a richer interaction than technologies such as video conferencing do not as students can independently maneuver telepresence robots and can interact with those present in the classroom. However, telepresence robots are generally controlled by the human operator with limited or no possibility for those in proximity to provide input. Thus it may be difficult for the human operator to get sensory input from their context while embodied in the telepresence robot and respond to it accordingly as when attending the classroom in person. This makes the operator of the telepresence robot a differently abled human. In addition, the robots may also introduce new types of concerns related to identity, courtesy and privacy.

I propose a study of the use of telepresence robots for educational purposes in the light of a Value Sensitive Design framework, with a focus on the values of privacy, identity, and courtesy.

Research Questions

My dissertation addresses the use of telepresence robots in the classroom. It endeavors to answer three research questions:

1-What are the perceived benefits and drawbacks of robotic telepresence in the classroom with respect to both the controller of the telepresence robot and those in proximity to it (other students and instructor)? This question aims to explore how robotic telepresence as a medium supports the interaction and engagement of the remote student and what limitations does this medium impose.

2- Are/ How the values of privacy, courtesy, and identity enmeshed into the design of telepresence robots? The goal behind this question is to investigate how the values of privacy, courtesy, and identity manifest in the use telepresence robots, and the ways the embeddedness of such values influence and are influenced by the use of telepresence robots. More specifically:

- Privacy: What are the stakeholders' (remote student, classroom students, instructor) privacy concerns? Do and how do the stakeholders manage their privacy concerns when using or being in proximity of telepresence robots? What are the privacy concerns, if any? What are the barriers to privacy?
- Courtesy: How can stakeholders provide respectful interactions when interactions are mediated by telepresence robots? What are their courtesy expectations?
- Identity: If and how operators think about expressing their identity in general? If and how operators think about identity with respect to the robot? How do operators project and express their identity through the robot? Are and how are these perceived identities understood by those in proximity?

3- How can the answers to the former research questions inform the design of telepresence robots for the classroom? The goal is to provide design recommendations that consider the classroom context as well as the values of the stakeholders.

Potential Contribution

I expect my dissertation research to make four contributions. First, reveal the benefits of the use of telepresence robots in the classroom. Secondly, to bridge the gap in the literature on the values involved in the use of robotic telepresence in the classroom; specifically, privacy, identity, and courtesy. And third, contribute to how future telepresence robots are designed for educational purposes while accounting for values.

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