Life happens, wherever you are! Use of telepresence systems to enhance school participation of children with chronic conditions

Pletschko, T.1, Trampisch, A.-L.1, Röhner, M.2 & Leiss, U.1

1 Comprehensive Center for Pediatrics, Medical University of Vienna
2 die Berater Unternehmensberatungs GmbH

Objective
Avatars, virtual classrooms and mobile robots have recently entered pedagogical-psychological work. In particular, these modern technologies can help children who are unable to attend school because of a chronic disease. The use of telecommunication technologies enables them to participate in class, ask questions and interact with their classmates and teachers. This can limit social isolation and disadvantage due to long hospital stays. This review aims to examine existing literature about the impact of social isolation of school-aged children with a chronic disease, telepresence systems and their use to connect those children with school as well as advantages and disadvantages in the use of different telepresence systems.

Methods
A systematic literature search in the databases of PsyCINFO and PsyCnFO was conducted (search terms: pediatrics or chronically ill children or oncology, telepresence or robot or virtual classrooms or virtual learning environment, social integration or social isolation or social interaction or virtual inclusion). Additional records were found via freehand search in Google Scholar and SCOPUS. Database and freehand search resulted in 1,499 articles. 15 of them were relevant to the review (cf. fig. 4). Exclusion criteria were the use of telepresence systems outside of the school setting, telepresence systems used by healthy individuals exclusively, social robots without the aim of providing connection and studies with adults or children younger than six years.

Results
15 of the 25 articles included, evaluated the use of six different telepresence systems, four with two-way video and audio transmission, three of which were remotely controlled by the student (fig.1), one system with one-way video, two-way audio transmission (fig.1) and one with one-way audio and video transmission (fig.2).

10 studies were examining effects of long hospital stays and school absence on the social life, psychological wellbeing and educational outcomes of school-aged children with chronic diseases. Mentioned effects are feelings of social isolation, worse grades due to bad communication with school about their current progress in class, less interaction with school friends, depression, missing out on important events and fear of being forgotten by their friends and classmates.

The most used form of telepresence technology was remote controlled, two-way video and audio transmission. While benefits like better social integration of the student in the class, restoring of a routine day, higher communication rates with classmates and teachers, reduced feelings of anxiety and in some cases improved test scores were reported for all of the telepresence systems, disadvantages were higher in mobile telepresence systems with two-way video and audio transmission. Remotely controlling led to mobility problems in crowded places and spots with bad WiFi connection. Two-way video connection was not always desired, as the student can feel insecure about his or her appearance. In contrast, one-way transmission did not provide the possibility of the student to communicate with his or her classmates, which limits interaction.

One-way video, two-way audio transmission allowed a degree of privacy for the affected child, while still maintaining the possibility of interaction through the two-way audio transmission. This system is particularly represented by AV1, a telepresence robot from the start-up “No Isolation” (fig.1). It allows for students in the classroom to carry it around, if needed. This enables increased mobility and social interaction, since students can take the robot to rest and field trips. Furthermore it increases involvement of fellow students and creates a sense of responsibility for their absent classmate.

Conclusion
Children and adolescents with a chronic disease experience a wide range of negative physiological and social effects due to long hospital stays and extended periods of absence from school. Telepresence systems are a good way to connect children and adolescents with their class. Enabling connection and communication therefore social interaction can lower negative effects and increase psychological wellbeing and educational outcomes of children with a long-term illness.

A wide range of telepresence systems already exists and properties of each system can be more or less ideal in different situations. In general, one-way video and two-way audio systems that allow to be easily carried around seem to be a promising approach for a wide range of cases. Since it is a new type of telepresence system, it opens possibilities for further investigation.

Future Prospects & Donations
At the Medical University of Vienna a systematic evaluation of telepresence-systems is currently conducted.

If you would like to support this project with a donation, please do not hesitate to contact the project manager Dr. Thomas Pletschko at thomas.pletschko@medunwien.ac.at.


Fig. 1: Telepresence Robot AV1
Fig. 2: Ambient Orb
Fig. 3: mobile telepresence robots Vico and Double

References

Fig. 4: Flowchart of systematic literature research.