Telepresence under exceptional circumstances

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Agenda

1. Introduction
2. PEBBLES Design and Description
3. Research Design, Data + Results
4. Discussion
5. Virtual Success Project at RCHEI
6. Acknowledgements
Introduction/Motivation

• Students in hospital lack social & academic continuity with regular school community
  -> reduced academic performance and social isolation, impact on health & well-being
  -> difficulties returning to school life
• Wayne Gretzky’s PEBBLES links students in the hospital with regular classroom
• communication “appliance” integrating video conferencing and simple robotics
  - provides connection through playful appearance & simple interface
• combined effort between Ryerson, U of T and Telbotics Inc. in Canada
PEBBLES Design

• What we are trying to accomplish
  – I am there, you are here, we are together (Lombard & Ditton, 1997)
  – Focus on communication tasks, not technology
  – Uses physical avatar & remote control, and audio/visual connection

• Achieve all necessary interactions not replicate face to face

• Users are children (mostly)
Prototype Physical Design

School Unit

Hospital Unit
Commercial Product Design
Interface Design - Hospital End
Research

• Field studies - case based

Research Questions

1. Acceptability and impact of PEBBLES?
   • Remote students
   • Classmates
   • Teachers

2. Support for social and academic connection
   • Efficiency and effectiveness of communication
Data Collection

• Students used PEBBLES for 1-4 hours per day for 5-9 weeks.
• Questionnaires/projective art tailored to each participant group
• Video data collection
  - multiple sessions taped over duration of study
Evaluation - Participants

1. Na’ama
   - 12-year old, 7th grade
   - dialysis patient
   - away from school since 4th grade

2. Kangesh
   - 12-year old, 7th grade
   - transplant patient
   - missed most of 7th grade

3. Thea
   - 9-year old, 2nd grade
   - dialysis patient
   - difficult medical and social situation

4. Others (parents, teachers, classmates, medical personnel)
Operational definitions of measures

• *Communication Interaction*
  - natural, positive vs disruptive or minimal
• *Concentration*
  - focus vs fidgety
• *Initiative*
  - take 1st step vs passive
• Ability to operate PEBBLES
• Technical issues
Results - Na'ama

**Positive Frequency**

**Negative Frequency**

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<th>N</th>
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<th>SD (sec.)</th>
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Results - Kangesh

Duration

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Results - Thea

Duration

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Positive Frequency

Negative frequency
Results – Other People

- Classmates
  - PEBBLES is “cool”
  - Liked being able to see, hear & communicate
  - Disliked technical difficulties
  - “come over here”

- Adults (parents, teachers, medical staff)
  - Overall positive effect on participation rates, communication and emotional state
  - Academic performance varied but generally positive
  - Wanted to have PEBBLES in classroom (special)
  - Upon return to school “it was like he never left”
Discussion - Common Threads

• Many communication and initiative learning behaviors but short duration
  - Normal student behaviour
• Concentration behaviors consistently prominent
  - Many distractions (TV, noisy equipment, etc.)
  - Different teaching styles
• Used common but subjective measures of academic performance
• Normal tasks in non-normal setting
  - Students in control of “self”
RCHEI

Mandate

• Facilitate connection to school while at hospital
  - No bedside teaching
  - Innovative model
• Partnership between student, Education officer at RCH, parents and teachers at regular school
• Technology plays important supportive role
  - Fit task and situation
Concluding Remarks & Future Considerations

• PEBBLES enhanced presence and behavior of remote student
  - Physical avatar
  - Simple user interface
  - PEBBLES is not TV or video conferencing

• PEBBLES played significant role in reducing isolation and maintaining connections

• Explore role of various advanced technologies at RCHEI
  - Health and well-being
  - Promoting connection to regular school
Acknowledgements + Sponsors

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- Toronto District School Board
- The Hospital for Sick Children
Thank you & Questions?

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