

TCELT Workshop
26 October 2017

Adapting Research Methods for People with Physical and Speech Impairments.

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Agenda (timings approx.)

- 14.05 Setting the scene
 - Background
 - Design of Assistive Technology
- 14.20 Informed Consent
- 14.30 Adapting Participatory Design Methods
- 14.50 BREATHER
- 15.00 Single Subject Case Studies
- 15.45 Discussion

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Assistive Technologies

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Vast potential ... and yet ... systems are not always usable...

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Standards for human-centred design

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Engaging all Stakeholders...

Adapting Research Methods

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Enhanced Consent: Participants with Communication Disorders (Yes / No?)

Challenge: How do we ensure informed consent from end users with communication disorders?

- Accessible information sheets
- Enhanced consent protocol

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The StandUp Project

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Enhanced Consent Protocol

Having a communication impairment does not necessarily preclude participants from giving informed consent. In such cases, it is good practice to confirm that participants understand the conditions of the study.

The participant must be able to answer all the questions in Part 1 correctly in order for informed consent to have been deemed to be given in Part 2. (This protocol is based on a consent protocol used in the following paper: Balandin, S., Berg, N., Waller, A. Assessing the loneliness of older people with cerebral palsy. Disability and Rehabilitation, 28:8. 469-479.)

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Part 1: Consent Verification

Please Tick Appropriate Box

Have you read and understood the Participant Information Sheet? Yes No

Have you been given an opportunity to ask questions and further discuss this study? Yes No

Have you received satisfactory answers to all of your questions? Yes No

Have you received enough information about this study? Yes No

Who have you spoken to? _____

Phi(D)/Mr/Ms/Ms/Ms _____

Do you understand that your involvement in the project is entirely voluntary? Yes No

Do you understand that you are free to withdraw from this study at any time? Yes No

Do you understand that you do not have to give a reason for withdrawing? Yes No

Do you agree to take part in this study? Yes No

If any of the answers are 'No' or you don't want to take part, don't continue with the standard consent form (Part 2).

Adapting Participatory Design Methods

Challenge: How do we involve end users with complex needs?

Traditional methodologies to involve users in:

- Identifying context of use
- Gathering user and organisational requirements
- Producing alternative designs
- Evaluating designs against requirements

Method	Context of Use	Requirements	Design	Evaluation
Diaries	?	?		?
Interviews	✓	✓	✓	✓
Questionnaire	✓	✓	✓	✓
Focus Groups	✓	✓	✓	✓
Observation	✓	✓	✓	✓
Think Aloud	?		?	?
Forum Theatre		✓		
Story Boarding		✓		
Prototyping		✓	✓	
Usability Testing				✓

Adapted from Suzanne Prior, PhD, 2011

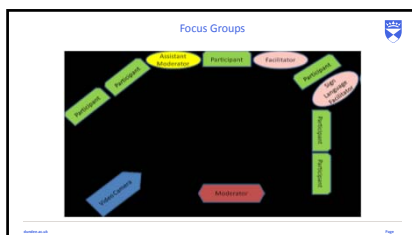
Dairies

Date	Time	Location	Partner(s)	Topic
10.10.2010	Evening	At the Office	Antoine	The cancelled workshop with one of our clients and my holiday in July
	Morning	In the Dental Clinic	The Dentist	How much will beehs willing to pay, what kind of filling she is going to have.

- ### Interviews
- Time
 - Advance notice of Question Guide
 - Video/Audio Recording



- ### Focus Groups
- Topic guide in advance
 - Moderation
 - Recording
 - Communication Rate
 - Assistants
 - Timing
 - Choreography
 - Feedback
- Prior S, Waller A, Kroll T, (2011).



Observations?

Hawthorne Effect?

Ethnographic strategies

Prototyping techniques

- Simulation
 - e.g. Virtual Reality to test planes
- "Wizard of Oz" scenarios
 - e.g. theatre, listening typewriter
- Slide show / storyboard
 - Paper and pencil mock-up

Forum Theatre

Developed by Augusto Boal in Brazil - "Theatre of the Oppressed"

Originally to be used by oppressed and marginalised groups

Allow them to provide their views and/or influence political change

Has been adapted for different purposes including design

Story Boarding (Prior, 2011)

Physical Design (Prior, 2011)

Usability Testing

Performance Metrics

- Task success, Time on task, Errors, Efficiency, Learnability

Heuristic Evaluation (inspection)

- E.g. visibility, match to real world, consistency
- Usability Experts

Issues-based metrics

- Focuses on identifying problems

Usability Testing

Self Reported Measures

- Subjective Usability Scale (SUS)
- Likert scale: e.g. "I think that I would like to use this system frequently"
- NASA TLX (Task Load Index)
- Likert scale:
 - Physical Demand, Cognitive Demand, Temporal Demand, Performance, Effort, Frustration
 - E.g. "How mentally demanding was the task?"

Forum Theatre – Multi-media Profiling

4 actors

- 2 adults with Complex Communication Needs (CCN)
- 2 professional non-disabled actors
- 3 days were spent in rehearsal – usually 1

The amateur actors took turns to rehearse

- Allowed them time to rest between sessions

Rehearsals took place at a day centre

A support worker was also present

Scripting issues

Scenario with Voice Output Communication Aid (VOCA) - dialogue was pre-recorded.

Scenario without VOCA - the script writer had used prose to provide directions for the actors.

Scripting issues

Scenario with VOCA - dialogue was pre-recorded.

Scenario without VOCA - the script writer had used prose to provide directions for the actors.

Actors with CCN required spoken dialogue even if their speech was unintelligible.

The scripts were rewritten for day two to include dialogue for all characters.

Scripting Dialogue

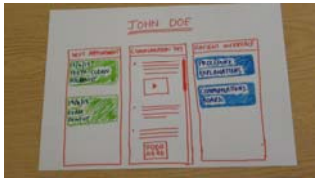
NURSE - How old is she?	NURSE - How old is she?
DOCTOR - (checks notes) Thirty-five. She's quite young.....	DOCTOR - (checks notes) Thirty-five. She's quite young.....
NURSE - Yes...but I mean....what sort of life?.....	NURSE - Yes...but I mean....what sort of life?.....
NURSE - <i>responds to Maria's now frantic shouts and movements</i>	MARIA - (Maria hears this and gets upset) I don't want to die!

Storyboarding

Scenario needed explanation

Stories at the Dentist: Iterative Prototyping

1. Paper prototyping

Iterative Prototyping

1. Paper prototyping
2. PowerPoint Prototyping
 - Based on Input from Dentists
 - Back to the Dentists for Feedback
3. Coded prototyping

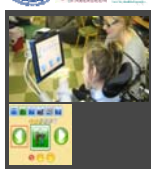


How was School Today?

Digital Economy (RCA) Funded, Partners: Aberdeen, Capability Scotland, Perth Education

"How was School today...?" provides the child with automatically generated narrative utterances based on sensor and other data.

"Storytelling puts an equal emphasis on the feelings and audience involvement as on the structure of the story, and regards narrative development as a social process which begins in infancy and is scaffolded by adults" (Groves, 2009)



Photos: Prototype user testing in a school (above) and interface screenshot (below)

Concept Prototyping



RFID Simulator (A. Alahabrizi & D. Westwater, 2008, MSc, University of Aberdeen)

Ethnographic Studies

Time	Place	Event	People	Interaction	Comment
9:20	Front entrance	Arrives in bus	Mary, John	chat	
10:45	Dining room	Picked up by teaching assistant	teaching assistant	chat	
10:45	Dining room	Snack time:	assistant, Sam, Rolf	food	Step-by-step recorded: "I met Rolf at Snack time", "He is here for his new project"
11:00	Hall	Eco-school opening event	all staff and pupils		normally Jane has phytio now, her class gets to discuss "Water" and "Global Citizenship" (Other subjects are "transport", "waste", etc.)

Observations: Message preparation on VOCA

- Message stored under specific "News" button (one message per button)
- Message typed by communication partner (SLT, teacher, parent)
- Message (ideally) discussed with user
- Old messages are deleted
- Some technical knowledge needed to program message

Interaction Data

RFID sensors track the child's interactions with:

- teaching and other staff;
- peers and friends;
- objects such as teaching tools.

Location Data

Sensors on doorways detect the location of the child.

User Modelling

The timetable provides information about time, activity, interaction and location.

Additional Data

Voice recordings can be added to the database to provide additional information that cannot be detected by sensors.

Generating Narratives

Time	Type	Object
20/11/12, 10:05	Location	Hall
20/11/12, 10:10	Person	Mrs Smith
20/11/12, 10:12	Person	Jenny
20/11/12, 10:14	Object	Tambourine

4 messages generated

I went to the hall.
We had music.
Mrs Smith and Jenny were there.
I played with the tambourine.

The Interface

- A maximum of five generated event narrations are chosen to be generated at the top of the screen for direct access.
- Each event consists of several messages - in this case 3 computer generated and 3 recorded messages.
- Events and messages can be easily evaluated by the student using smiley buttons.

Pilot evaluation - How was School Today? (Black, Walker et al. 2012, TOCHI)

Then I went to Junior Primary instead of Reading.

Right!
No reading? Junior Primary?
I wonder why that was.

A visitor was there. Oh, a visitor, right.
I wonder what the visitor was doing?
"The dentist happened to come to give a visit."

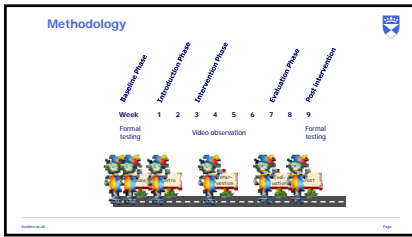
A visitor was there. That was the visitor.
Oh yes, that's why you went to junior primary, wasn't it?
What did she think of the school?

She is nice. She was nice, that was good! Very Good!

STANDUP: Pun Generation

Dr Graeme Ritchie, Aberdeen
Dr Helen Pain, Edinburgh

What do you call a spicy missile?



The Margaret Harris Lecture on Religion: Strength In Silence

Next Event
 Date: 10/11/2017
 Location: [Lecture Hall](#)
 URL: [http://www.dundee.ac.uk/religion/lectures/margaret-harris-lecture-on-religion-strength-in-silence](#)

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References

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