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Supporting Health By Technology VIII



Title symposium

Powertools: co-designing technological interventions to empower intellectually disabled people

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Abstract:

Being able to carry out activities of daily living independently is becoming more and more important in the light of the socialization of health care. For clients with a cognitive impairment (such as mild intellectual disability or autism spectrum disorder) it is often difficult to acquire skills needed for these activities. Technological interventions that support self-reliance, for example by helping users to bring more structure into their days, are highly promising. However, until now development of these interventions has often been technology-driven, instead of starting from the perspective of the client or the caregiver. Also, since the adoption of the new technology provides clients and caregivers with the difficult task to develop new behaviors, the majority of these technologies has not been implemented permanently. Chances of actual and sustainable impact on self-reliance improve if development of technology starts from the needs, knowledge and skills of clients and caregivers, by using a co-design approach.

In the Powertools project (Feb. 2016 - Feb. 2018), a consortium of Dutch knowledge institutions, care institutions and companies have collaborated on co-designing and co-evaluating technological interventions for persons with a mild intellectual disability or autism. The project has resulted in three types of deliverables: (1) concepts and prototypes of technological interventions related to structuring daily life, coping with stress and social interaction; (2) co-design and co-evaluation techniques to involve clients and caregivers in the development process of the technology; and (3) design principles for technology that supports self-reliance which meets the needs, knowledge and skills of clients with an intellectual disability.

In this symposium, we present results of the Powertools project from three perspectives: the co-design process, design principles and evaluation of technology in health care practice, illustrated by six different technological interventions. We discuss process and outcomes with two representatives from the participating care institutions.

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Title presentation 1

Empowerment by technology: a critical analysis using a co-design approach

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Abstract

Background:

As health-care policy increasingly focuses on ‘empowerment’ [1] technologies are developed to support persons on the autistic spectrum in independent living [2]. Technologies often straightforwardly help people performing daily tasks. We used co-design to explore first what ‘empowerment’ can actually mean, starting from the everyday lives of the people involved.

Methods:

Insights are grounded in three case studies. In each study we worked closely with one or two people on the spectrum (9 months - 4 years). Cycles of contextual interview, role-play, collaborative brainstorming, and prototype evaluation produced a designerly understanding of empowerment and empowering technology.

Findings:

Reflections on the cases revealed two interpretations of empowerment: 1) Functional: to design a tool that enables a person to (learn to) do something without the help of others. 2) Embodied: to design technology that helps a person to get a grip on ones’ lifeworld. This means to build technology as extensions of people’s talents and opportunities in the local setting, scaffolding a person’s own ways of doing [3].

Discussion:

In (1) co-design is a form of information gathering, to find out what is needed for a person to perform the task independently. In (2) the co-design project is just one phase in a larger transformation process driven by the person. We advise using tangible prototypes and collaborative activities in the use context. We envision technologies that people may later appropriate, personalize, and adapt in use. Finally, care-professionals have rich expertise and concern for clients, yet reason ‘as professionals’. It is important not judge the professional’s opinion as higher than that of the main user when making design decisions. Co-design can in fact help to align the two stakeholder perspectives.

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Title presentation 2

Design principles for technological interventions for users with an intellectual disability

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Abstract

Background:

In order to design technological interventions for users with an intellectual disability, existing design principles should be taken into account ([1-5], [7-10]). These principles deal with aspects such as user control, personalization, error messages, feedback, help, navigation, lay-out, use of color, and information presentation (language and visuals). In the course of co-designing interventions, existing design principles can also be evaluated and updated. In Powertools, existing principles were applied, evaluated and updated during the development of TasKing, a smartphone app that reminds persons with an autism spectrum disorder (ASS) to carry out daily tasks in a non-compulsory manner.

Methods:

A first working prototype of the TasKing app was co-designed with the target group and health care professionals. The app uses visuals, easy to read text and simple navigation (mainly through swiping). Subsequently, the app was evaluated by both usability experts and users, using various common evaluation methods like cognitive walkthroughs, heuristic evaluations, expert reviews and thinking aloud.

Findings:

We discovered that some existing design principles need more emphasis when designing interventions for this target group. For example, graphical elements must contain as little detail as possible to avoid distractions. Also, the heuristic “visibility of system status” ([6]) should be applied more often and more explicitly. In general, personalization and feedback about progress and system status, in various forms (audio, tactile and visual), is highly appreciated by the target group.

Discussion:

In the next version of TasKing, the system status should be displayed in a preferred modality and graphical elements should be re-designed to show less detail. This reflects characteristics of the ASS target group of wanting to be in control and avoiding incentives. Current guidelines for designing for people with an intellectual disability should be adapted to reflect these findings, so that designers can take advantage of our experiences.

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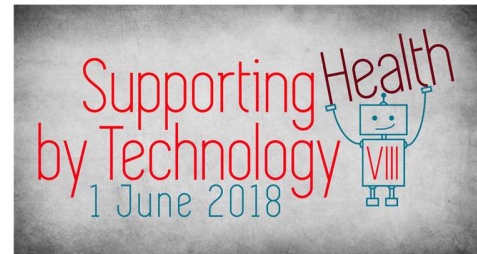
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Title presentation 3

Integrating the evaluation of technology in health-care practice

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Abstract

Background:

Participatory design (PD) methods allow individuals with autism (with/ without intellectual disability) to contribute to the design of assistive technologies relevant to users' life worlds. However, integration of PD in regular healthcare practice and measuring its value related to practical outcome remain challenging. Singular measuring instruments appear inadequate to address the complex embedding of assistive technologies in the life-world of their users and the multidimensional character of wellbeing. Our objective was to provide an integral understanding of what constitutes a successful outcome of participatory-designed assistive technologies, through a practice-oriented approach in which technologies are co-evaluated for and with individuals with autism and their caregivers.

Methods:

An evaluation suite for use in health-care practices was developed, consisting of a narrative interview, socio-material mapping, quality of life questionnaires, practitioner log entries and user-experience/usability checklists. Four cases of assistive technologies were evaluated with a group of young adult individuals with autism: 1) 'TasKing', a mobile application that assists with fulfilling everyday chores, 2) the 'M-Power' tablet that helps people with face-to-face conversations, 3) the OOC pillow that supports stress relief, 4) the Tinybot, a robotized planning assistant. The data were interpreted with researchers and practitioners during several 'community-of-practice' meetings.

Findings:

We present results from the evaluation of the assistive technologies. Data generated with components of the evaluation suite provide insight both in a) the subjective and objective effects of the technologies on the wellbeing of the participants involved and b) the consequences of PD processes on day-to-day care.

Discussion:

Our findings suggest that PD aligns within organizational policies embracing a conception of care as a co-production of care-provider and care-receiver. However, extrapolating the results to the broader organization remains fickle. Moreover, transfer of PD-processes to other organizations unfamiliar with participatory approaches requires investing in the broader 21st Century Skills of professional workers.