RoboPlus: collaborating with coaches of ASD children on the use of social robots

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Abstract. This paper describes the start phases of our practice based research on the usefulness of social robots in youth care institutions, working with young people with forms of autism. We highlight especially the collaboration between researchers and practitioners in the development of our research design. This includes the choice of specific robots, possibly with adjustments, to match particular needs of practitioners in their regular work processes.

Keywords: Social Robots, Autism, Collaborative Design

INTRODUCTION

A lot of research has already been done, and is ongoing, on social robots as assistants for young people coping with forms of autism (ASD; Autism Spectrum Disorders), and as assistants in their therapies. However, this is still mostly done in experimental settings, rather than as part of regular daily activities, regular therapy or education [1].

The project 'Roboplus' (2017-18) focusses on these regular settings, especially the possible deployment of social robots in regular work sessions in youth care institutions, including children with ASD.

The project is undertaken by Windesheim Flevoland in cooperation with five youth care institutions in the Dutch cities Almere and Lelystad, and several research partners. The youth care institutions had shown their interest in advance, and participated in brainstorm sessions about possible deployments of a variety of robots, introduced by the researchers.

An important starting point was the shared interest in robots as a possibly extra tool for professionals, to better achieve their own goals in their work with young clients with ASD (and sometimes also their parents). The aim of the project is, to improve the goal oriented interactions of the professionals with these clients.

PHASES IN COLLABORATION

Initial interviews

The project started as a series of sessions with professionals (partly practitioners, partly management) of each institution, to map the bottlenecks they encounter in their regular work processes with individual clients with ASD, or group activities where clients with ASD are included. They were specifically advised to map these professionals bottlenecks without anticipation on ideas for robot based solutions.

This advice was given to prevent tunnel vision, tending to occur when people focus too strongly on 'what a robot could do'; as this is often based on just vague impressions, too restricted or too glorious expectations of robotic possibilities. Or in worst case, it could lead to the deployment of robots just because they can do something, disregarding the question if that something really connects to encountered problems and work goals to be attained.

After mapping the bottlenecks, we asked the professionals how they had tried to tackle these up till now, why that did not work, and finally: why then, do you think, could a robot offer a solution? Which characteristics are required in such a robot?

The outcomes of this questioning were not spectacular, in as far as the desired characteristics corresponded with those usually noted to be especially relevant to people with ASD: the neutrality of expression, constant and unchanging in repetitive (inter)actions, the possibility to practise safely time and again with interactional codes. However, with regard to the collaboration between the researchers and practitioners, this process was really essential to improve mutual understanding and engagement.

Requirements for suitable robots

This was continued in the selection of specific robots, with the perilous problem how to make a trade-off between desired characteristics, and types of social robots that are financially affordable for the participating youth care institutions. After all, it had to be robots that, if these pilots would prove to be successful, were payable – and possibly in larger quantities than just one or two - from their regular budgets.

So here some disillusions did lay in wait. It was clear to all that advanced but very pricey social robots like Kaspar or equivalents, favorite in many laboratory experiments with children with ASD [2], were out of the question.

The researchers presented a selection of alternatives up to maximally €500 apiece, also mentioning possible little adjustments to enhance their usages. Some practitioners or their managers, not satisfied with the limited capabilities of these specimens, undertook treasure hunts themselves on the internet. Coming up triumphantly with alternatives, it took some time before they accepted the explanation of the researchers that the capabilities of robots can be presented in a deceivably flattering way.

Once resigned to the limitations of affordable social robots, the professionals redesigned their (up to now rather general) wishes into more modest but concrete plans, for the deploying of this kind of robots in their own work processes. In one institution the toy dinosaur Pleo [Figure 1] was chosen to explore his possibilities as a help for dimming individual emotional eruptions during group sessions, and so ease the way to regain contact with the child. Elsewhere Pleo was chosen as an extra tool in forms of guided play, targeting the growth of awareness about social interaction repertoires.

Figure 1. Pleo

Other institutions wanted a robot to assist children in learning processes for cleaning up messes in the kitchen or their own room. Hitherto used instruction schemes (digital or on paper) tend to be disregarded or misunderstood by the children. The accompanying parents lose their patience; and coaching youth care professionals at long last also feel an emotional tone creeping up in their reactions, which is held to be disturbing for children with ASD and thereby contra productive in the coaching process. Hopefully a robot could give more neutral directions and responses; but above all it is expected that a robot will have an extra motivating impact on the children.

For these 'cleaning' pilots, several programmable (and affordable) robots were first shown to a group of young clients, letting them indicate their preference as described in a paper of Scheick, Meijer and Heerink [3]. This conquest was won by the Meccanoid [Figure 2]. On account of his humanoid appearance, this robot was perceived as a convincing task advisor.

Adaptations

Adjustments to the chosen robots were made by technicians attached to the project. Pleo is normally developing certain capacities in stages of use, but for usability in the playing groups he had to start on an advanced level.

This was not easily contrived, since this factory product is not made for such manipulations. This already implicates the question, to which extend practitioners are dependent on technical expertise in eventual future use of this (and any) robot.

The same and more goes for the Meccanoid. This robot was adjusted with a smartphone, in which a script could be programmed: consisting of questions, instructions and feedback. This script is drafted in collaboration between practitioners, researchers and technicians. Some accompanying speech, gestures and changing eye colours are also collaboratively designed.

The pilots will have to reveal the suitability and effectiveness of this upholstering, which we are curiously awaiting, just as we do await the usefulness of Pleo in the other pilots.

Figure 2. Meccanoid

Measuring instruments

Last but not least: the complete research designs and measuring instruments for the several pilots are also composed in consultation with the practitioners: partly for the whole project, partly tailor made for each pilot. During the writing of this paper, the effectuation of the thus developed pilots was still forthcoming.

CONCLUSIONS

Practice based research, choosing and exploring the usefulness of social robots for contextually specific aims, is also an intriguing search into collaboration processes between researchers, practitioners and technicians. The details in these processes require more eager attention.

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