KASPAR the Social robot

Type of Project

Intervention

Summary

KASPAR the social robot.

KASPAR is a child-sized humanoid robot, developed at University of Hertfordshire, U.K., as a therapeutic tool to encourage communication and social interaction skills in children with autism and other cognitive and developmental impairments.

KASPAR has the ability to engage in a range of simple interactive play scenarios, such as turn-taking, imitation, shared gaze or speech related activities (e.g. talking , singing), and it has been designed to be used as a social mediator, encouraging and helping children with autism to interact and communicate with adults and other children.

The KASPAR project is an ongoing research that has started in 2006. The robot has been designed to be inexpensive, with the aim of making a final model affordable to as many families and schools who might benefit as possible. Currently several KASPAR prototype robots are being deployed both in Special Education schools and in families homes.
(further details can be found at http://kaspar.herts.ac.uk)

Low-tech, high-tech products, services and contexts for play

KASPAR is a child-sized minimally expressive robot with human-like features (e.g. face with nose , eyes mouth) that uses bodily expressions (movements of the hand, arms and facial expressions), gestures and voice to interact with people. The robot has a head that can move in all directions, face that is made from a silicon rubber mask and includes eyes that can move, eye lids that can open and shut and a mouth that can smile and capable to portray happy or sad expressions. In addition, KASPAR was mounted with several skin sensors for tactile sensing capabilities that allow the robot to respond autonomously when being touched. The robot could also be operated by a remote controlled keypad which can be used by the children that interact with it or by an accompanied adult e.g. therapist , teacher, parent etc.

The robot provides an enjoyable, safe, predictable and non-judgemental play environment where children with autism and other cognitive and developmental impairments can learn through play about social interaction and communication.

The context of use

Currently several KASPAR prototype robots are being deployed as part of the ongoing research, both in Special Education schools and in families homes.
KASPAR has been designed to help teachers and parents support the children in many ways.
1) At a school context, Kaspar can be used either in a one-to-one interaction with a child or in a group settings. Kaspar can be adapted to the needs of an individual child and be used by a teacher or a therapist (e.g. Speech and Language Therapist) to assist the child with specific therapeutic or educational objectives. Kaspar can also be used as a social mediator, encouraging interactions between the child and other people (peers and adults), or in a group context, with activities that compliment the work in the classroom.

2) At a family home setting the study primarily aims to evaluate a) how KASPAR can serve the role as a social mediator, encouraging interactions between the child and his/her parent/carer or other family members, siblings and friends, b) How KASPAR's play scenarios can be developed to complement the child's daily home activities.

An important aim of the studies in both these two contexts, i.e. in schools, and homes , is to evaluate if there are any observed changes in the children's behaviours and/or social skills outside the play sessions with the robot.

Type of play in this play system

Cognitive

Practice

Social

Solitary
Cooperative

Objectives related to play according to ICF-CY

Play for the sake of play: Major life areas - d880 enagement in play

d8800 solitary play
d8803 shared cooperative play

Community social and civic life - d920 recreation and leisure time

d9200 play

Play-like activities: Therapeutic and educational objectives

b1 Mental functions
b2 Sensory functions and pain
b3 Voice and speech functions
d1 Learning and applying knowledge (learning through symbolic play, learning through pretend play)
d3 Communication
d7 Interpersonal interactions and relationships

Number of participants

>20

Chronological Age

3-6 years
6-12 years
12-18 years

Development Age

0-3 years
3-6 years
6-12 years

LUDI Categories of disabilities

mild
moderate
severe
profound
Communication disorders (speech and language disorders):
Autism Spectrum Disorders:
Multiple disabilities:

Explanation on the use of low-tech, high-tech devices, services or contexts

Explanation

No instruction, self-discovery of the participant/subject
Verbal instruction, language and communication fitting to chronological age
Verbal instruction, language and communication is adapted
Visual instruction with pictures or drawings
Modeling by therapist/researcher
Hand over hand: therapist/researcher leads the actions of the participant
Modeling by peer
Visual instruction by peer
Verbal instruction by peer

Involvement

Adult: therapist/educator/researcher
Parent or significant others
Peer with disabilities
Peer without disabilities

Role

Non-participatory observer
Participatory observer
Providing instruction
After the instruction, providing supervision during play

Summary of achieved effects

Field studies with KASPAR and children with autism at schools, and at families' homes provided many case study examples showing possible implementation of KASPAR for therapeutic or educational objectives. These case studies show how the robot can:

* helps to break the isolation
* encourages the use of language,
* mediates child-child or child-adult interaction,
* helps children with autism manage collaborative play,
* compliments the work in the classroom
* provides the opportunity for basic embodied and cognitive learning, resulting in the emerging awareness of cause and effect.
* help to explore basic human emotions e.g.‘happy’ and ‘sad’

References to the intervention or research project

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Publication

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Keywords

Robots, Social Robot,