EDUCERE: Smart toys for detection of problems in children development

Type of Project

Ongoing research project

Summary

EDUCERE is an I+D+i project supported by the Spanish Ministry of Economy since the beginning of 2014.
The objectives of this project are researching, developing and assessing innovative solutions for the detection of problems in children development, by means of the natural interaction of the child with toys and everyday objects. These solutions could contribute not only to the diagnosis but also to the promotion of stimulation and early attention in real contexts such as home and school.
Professionals and researches from Ceapat and different universities collaborate in this multidisciplinary project in which engineers, phisiotherapists, psycologists, pedagogues and experts in special education are involved.
Four different toys have been developed: tower of cubes, game of pins, ball and rattle and almost 100 children have participated in experiments.
At the end of the project, which is in a very advanced stage, an expert system based on smart toys will be available. This system analizes data and contribute to detect warning signs of problems in development, at home or school, and enables specialists to make an early diagnosis and treatment.

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

EDUCERE is an I+D+i project supported by the Spanish Ministry of Economy (State plan of scientific and technical research and innovation 2013-2016).

The objectives of this project are researching, developing and assessing innovative solutions for the detection of problems in children development, by means of the natural interaction of the child with toys and everyday objects. These solutions could contribute not only to the diagnosis but also to the promotion of stimulation and early attention in real contexts such as home and school.

Professionals and researches from Ceapat and different universities (Universidad Politécnica de Madrid, Universidad de Alcalá de Henares, Centro Universitario Cardenal Cisneros y Universidad Autónoma de Madrid) collaborate in this multidisciplinary project.

Four different toys have been developed: tower of cubes, game of pins, ball and rattle. The tower of cubes tries to detect problems in motor development of two and three year olds, such as difficulties in coordination, fine motor skills and eye-hand coordination. The rattle, is designed for children from 0 to 1 year, the game of pins for children aged 4 and 5, and the ball for children 5 and 6 years.
The toys, designed with pressure and acceleration sensors, are based on “low cost technology” using a 3d printer.

At the end of the project, which is in a very advanced stage, an expert system based on smart toys will be available. This system analizes data and contribute to detect warning signs of problems in development, at home or school, and enables specialists to make an early diagnosis and treatment.

The context of use

Home, school and rehabilitation center.

Type of play in this play system

Cognitive

Constructive

Social

Solitary

Objectives related to play according to ICF-CY

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

d8800 solitary play

Community social and civic life - d920 recreation and leisure time

d9200 play

Play-like activities: Therapeutic and educational objectives

b1 Mental functions

b7 Neuromusculoskeletal and movement related functions

d4 Mobility

Number of participants

>20

Chronological Age

0-3 years

3-6 years

Development Age

0-3 years

3-6 years

LUDI Categories of disabilities

Mental/intellectual impairments::

Physical impairments:

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

Explanation

Verbal instruction, language and communication fitting to chronological age

Modeling by therapist/researcher

Involvement

Adult: therapist/educator/researcher

Role

Providing instruction

Evaluation of objectives and outcome measures

Description of outcome measure(s)

Video analysis

Information about availability of outcome measure: publisher, website, contact person

website: https://educeremus.wordpress.com/

Publications: https://educeremus.wordpress.com/publicaciones/

Summary of achieved effects

Four different toys have been developed: tower of cubes, game of pins, ball and rattle. The tower of cubes tries to detect problems in motor development of two and three year olds, such as difficulties in coordination, fine motor skills and eye-hand coordination. The rattle, is designed for children from 0 to 1 year, the game of pins for children aged 4 and 5, and the ball for children 5 and 6 years.
The toys, designed with pressure and acceleration sensors, are based on “low cost technology” using a 3d printer.
Until now the research has been carried out in three schools with almost 100 children. Data from experiments is processed and analized in order to distinguish between normal and anomalous development. The results can be shown individually as well as statistically depending on the selection criteria.
This project is in a very advanced stage. At the end, it will be available an expert system based on smart toys that analizes data and contribute to detect warning signs of problems in development, at home or school and enables specialites to make an early diagnosis.

References to the intervention or research project

Miguel Angel Valero:
mavalerod@imserso.es

Contact Person

Miguel Angel Valero:
mavalerod@imserso.es

Website

https://educeremus.wordpress.com/

Keywords

Smart Toys, low cost technology, diagnosis, development, early attention,