

# LUDI: a Pan-European Network Addressing Technology to Support Play for Children with Disabilities

Rianne Jansens<sup>a</sup>, Pedro Encarnação<sup>b</sup>, and Serenella Besio<sup>c</sup>

<sup>a</sup>*Zuyd University, the Netherlands, Occupational Therapy Department and Centre of Expertise for Innovative Care and Technology. LUDI Action Working Group 2 Vice Leader*

<sup>b</sup>*UCP - Católica Lisbon School of Business & Economics, Portugal. LUDI Action Vice Chair*

<sup>c</sup>*Università della Valle d'Aosta, Italy. LUDI Action Chair*

**Abstract:** The right to play is enshrined in the United Nations Convention on the Rights of the Child as a consequence of its importance to overall child development. Children with disabilities are often deprived of this right due to functional limitations, the lack of supporting technologies, and social and cultural contexts in which play is frequently seen as secondary when compared to rehabilitation interventions. This paper presents the COST Action LUDI, a Pan-European network aiming at the recognition of the theme of play for children with disabilities as a multi- and trans-disciplinary research field to which the contribution of psycho-pedagogical sciences, health and rehabilitation sciences, humanities, assistive technologies and robotics, as well as the contribution of end-users' organizations, is necessary to grant the right to play for children with disabilities.

**Keywords:** Play, children with disabilities, assistive technology, LUDI

## INTRODUCTION

Play is the most prevalent activity in childhood. Although sometimes play is regarded as a leisure only activity, there's a huge body of knowledge, starting back from the 1950's, showing that play is the motor for child development [1,2,3]. Its importance is recognized by the United Nations, establishing play as one of the rights of the child (Article 31 of the Convention on the Rights of the Child). With the current technology ubiquity, it comes as no surprise that children are today very familiar with technological toys. Technological developments have thus influenced children's occupations namely play [4].

For children with disabilities play is not less important than for typically developing children. For them, the use of technology may be challenging, if accessibility issues were not taken into consideration in the design [5,6]. On the other hand, for many children with disabilities, (assistive) technology is the mean to access to play activities, and this has been addressed by many authors. For example, Cook et al., describe how robots can be used as assistive technologies for play, learning and cognitive development [7]. Cabibihan's et al., review on social robots for children with autism spectrum disorders shows the opportunities created by robots to increase the autonomy of the child [8]. Children with disabilities have more possibilities in playing with the use of technology. Within the

International Classification of Functioning, technology can expand the child's health dimensions and environmental determinants of health. For example, Miller & Reid report that competence and self-efficacy increased in children with cerebral palsy engaging in a virtual reality play intervention [9]. Technology opens the doors to more play scenarios. Playfulness can be more present. It provides adults opportunities to get in contact and to have meaningful time together [10,11].

## LUDI, A NETWORK IN THE FIELD OF RESEARCH AND INTERVENTION OF PLAY FOR CHILDREN WITH DISABILITIES

Despite the scientifically recognized importance of play and the technology available, children with disabilities are often deprived from the right to play. Physical and/or cognitive impairments may prevent them to access to play activities. Social and cultural contexts may also raise hurdles for children's play. In fact, frequently parents and caregivers place play very low in the hierarchy of activities a child with disabilities should engage, something to be done only if there's some free time after educational and rehabilitation commitments. In therapy play is seldom considered the goal per se.

Using technology to support play faces sometimes doubts, resistance and concerns from the professionals. For most of the rehabilitation professionals, technology in care or education was and still is not part of their education or continuous professional development [12]. As technological developments are going fast, it's hard to keep pace with them. Some professionals fear that this evolution might reduce their therapeutically influence or even will place their jobs at risk. Looking at technology, many tools are still at the development stage, prototypes emerging from innovative projects, and thus are not 100% reliable and user friendly.

Many disciplines, like psychology, education, (rehabilitation) medicine, or engineering, have focused on the topic of play. However, a holistic view, encompassing all the different perspectives, is necessary to effectively grant the right to play for children with disabilities. This motivated the creation in 2014 of "LUDI – Play for Children with Disabilities", a 4-year Action supported by the

European Cooperation in Science and Technology (COST) framework ([www.cost.eu](http://www.cost.eu)). LUDI is a Pan-European network of researchers, scientists, practitioners, users and their families, including members from 27 European countries and from 5 international partner countries ([www.cost.eu/COST\\_Actions/TDP/Actions/TD1309](http://www.cost.eu/COST_Actions/TDP/Actions/TD1309); [www.ludi-network.eu](http://www.ludi-network.eu)). Its main goals are:

- a) *Collecting and systematizing all existing competence and skills: educational researches, clinical initiatives, know-how of resources centers and users' associations;*
- b) *Developing new knowledge related to settings, tools and methodologies associated with the play of children with disabilities;*
- c) *Disseminating the best practices emerging from the joint effort of researchers, practitioners and users.*

## **A DATABASE OF TECHNOLOGY TO SUPPORT PLAY**

One of ultimate goals of LUDI is the recommendation of guidelines to the design and development of technology to support play for children with disabilities and of methodologies to evaluate usability, accessibility and effectiveness of that technology. As a first step towards this goal, a database of available technology to support play for children with disabilities, including methods for assessing usability, accessibility, and effectiveness, is being created. Clearly, given the existing number of technologies (e.g. many toys brands have new collections every six months), it is not possible to have a fully comprehensive database. Instead, the objective is to collect a vast number of examples that can inspire users and clinicians, can elicit cooperation and foster discussion. For example, a parent will be able to retrieve from the database technologies available for his child with a particular age and disability, a researcher will be able to list robots that are being used to support play, or a clinician will be able to find assessment methods for an intervention with a particular technology. The database will be available from the LUDI webpage ([www.ludi-network.eu](http://www.ludi-network.eu)) and will be open for everyone to contribute and consult.

## **CONCLUSIONS**

Given the importance of play for child development, the challenges children with disabilities face to have access to play activities, and the fragmentation of research initiatives, often conducted within a particular scientific field framework, the LUDI COST Action aims at creating a multi- and trans-disciplinary research area that focus on play (for play sake) for children

with disabilities. LUDI, together with international organizations such as the International Play Association and the International Council for Children's Play, will promote the cooperation between rehabilitation professionals, engineers, educators, psychologists, sociologists, users and their families, and all of those that are involved in the theme of play for children with disabilities.

By collating state of art and agreements about definitions of play, models, assessments, and interventions, a body of knowledge will be created supporting everyone who wants to stimulate the play of children with disabilities at home, schools, daycare centers, or in public spaces.

Technology, as an enabler for children's play, will have a central role in LUDI.

## **REFERENCES**

1. J. Piaget, *The Construction of Reality in the Child*. Great Britain: Routledge, 1954.
2. J. Huizinga, *Homo Ludens; A Study of the Play-Element in Culture*. Boston, Beacon Press, 1955.
3. L. Vygotsky, *Mind in Society: The Development of Higher Psychological Processes*. Cambridge: Harvard University Press, 1978.
4. J.A. Davis, H.J. Polatajko, & C.A. Ruud, Children's occupations in context: The influence of history. *Journal of Occupational Science*, *9*(2), 54-64 (2002).
5. T. Heah, T. Case, B. McGuire, & M. Law. Successful participation: the live experience among children with disabilities. *Canadian Journal of Occupational Therapy*, *74*(1), 38-47 (2007).
6. Copley, & J. Ziviani, J. Barriers to the use of assistive technology for children with multiple disabilities. *Occupational Therapy International*, *11*(4), 29-243 (2004).
7. A. M. Cook, P. Encarnaçao & K. Adams. Robots: Assistive technologies for play, learning and cognitive development. *Technology and Disability* *22* (3), 127-145 (2010).
8. J-J. Cabibihan, H. Javed, M.J. Ang, & S.M. Aljunied. Why robots? A survey on the roles and benefits of social robots in the therapy of children with autism. *International Journal of Social Robot* (5), 593-618 (2013).
9. S. Miller, & D. Reid. Doing Play: Competency, Control and Expression. *Cyber psychology & behavior* *6*, 623-632 (2003).
10. A.M.R. Rincon, K.D. Adams, J. Magill-Evans & A.M. Cook. Changes in playfulness with a robotic intervention in a child with Cerebral Palsy. *Assistive Technology: From research to practice*, 161-166 (2013)
11. R. Bemelmans Paro bij Pergamijn. Ondersteuning n de zorg voor mensen met een (meervoudige) verstandelijke handicap. Heerlen: Eizt Zuyd University (2015).
12. L. de Witte Technologie in de zorg; Wat moet je daarmee in de zorgopleidingen? *Vakblad voor opleiders in het gezondheidszorgonderwijs*, *7* (Dec 2013).