



Educational Robotics for Students with Learning Disabilities

Start: 01 January 2014

End: 31 December 2016

Duration: 36 months

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**Robots can provide a powerful alternative learning tool
for students with learning disabilities.**

**They can be programmed to interact with students in specific ways
to encourage and engage them in their everyday learning activities.**



Robots can play a key role in engaging the learner and enhance the informal learning most children naturally develop as they play. Some students on the autistic spectrum may find robots easier to engage with and less threatening than human teachers. The EduRob team carried out research in Special Education in each of the partner countries which highlighted the areas of learning in Special Education where robots had potential to be used. The identified learning areas are: Imitation, Cause and Effect, Problem Solving, Communication and Social Learning.

The EduRob project team have developed a suite of learning scenarios that can be adapted and used by SEN teachers to enhance lessons, teaching a range of core curriculum subjects. The curriculum guides teachers through learning scenarios that can impact learning targets in mathematics, communication, languages, personal health and social education (PHSE), physical education, science and music.



Lifelong
Learning
Programme

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The robot may act as a trainer. In this case the SEN teacher, or the learner themselves use the specially developed EduRob Robot Controller app to initiate sets of pre-programmed robot behaviours. The robot will, for example, have a set of greeting behaviours, encouragement behaviours and congratulatory behaviours which can be fired either using the robot's sensors, by inputs on the app, or by the teacher. The EduRob Curriculum document details a number of specific ways each created scenario can be adapted and used in order to encourage learners to meet the goals of their individual education plan.



The robot may also act as a peer, for example, engaging in conversation with the learner to enhance communicational skills, or providing actions or sounds for the learner to imitate.

The EduRob Robot Controller app has been developed to work with two robot types, the NAO robot and the Lego Mindstorms EV3. The two robot types offer a range of interactions based on their specific sensor and feedback arrays. The NAO robot offers greater humanoid feedback and interaction, being able to mimic human physical behaviours, whereas the Lego robots offer a cheaper solution which can still deliver movement, audio and visual feedbacks.

The interactions have been developed in close collaboration with a set of Special Education schools in the partner countries, and are being tested in those schools to enable iterative enhancements to the interactions, the apps and to the methods in which they are applied within lessons.

