Robotic therapy helps children's coordination

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Researchers from the University of Leeds are developing an innovative new robotic device that helps children to practise and improve their hand coordination.

The robotic arm uses haptic technology – meaning it applies forces, vibrations or motions to the user – to guide a child's hand as they play computer games designed to help writing.

The games the children play require them to practise hand and wrist movements commonly made during handwriting and other manual tasks. As the child plays the games, the robot's arm helps them learn the correct movements by pushing and pulling the pen in the direction

required to make the right moves.

The research has been led by Professor Mark Mon-Williams and Dr Liam Hill at the University of Leeds, in partnership with the Bradford Institute for Health Research and colleagues at the University of Indiana in the United States.

Dr Hill said: "In trying to support a child with handwriting and coordination difficulties one of the major challenges teachers and occupational therapists come up against time and again is the limited time they have to work one-to-one with each child. In this respect haptic robotic technologies have huge potential efficiency benefits.

"They provide a means by which children can receive supported practise, at a level which adjusts to their growing abilities, without the need for one-to-one interaction with a therapist. Banks of these systems could be used simultaneously by multiple children in a clinic or in the classroom setting, under the supervision of a single overseeing professional."

The first United Kingdom pilot of the device has just been completed, demonstrating its feasibility for use in the classroom. This was carried out with a small number of five- to seven-year-old children in Bradford with a wide range of manual abilities.

The researchers investigated their level of motivation and enjoyment whilst practicing for 20 minutes on a variety of robotic arm tasks presented previously in US-based studies using the system.

All the children found the tasks highly enjoyable and were able to perform them to an acceptable level. Differences in performance between children previously identified by their classroom teachers as having handwriting difficulties were also noticeable.

Plans are now under way to run a larger intervention study within schools in Bradford that will formally investigate whether earlier research findings from the US can be replicated in younger schoolchildren in the UK.

Professor Mon-Williams and Dr Hill presented their findings at the British Psychological Society's Cognitive and Developmental Sections Joint Conference, in Reading.

Provided by University of Leeds