

**Dr Julia Föcker, University of Lincoln**

**W.I.S.E.**

### **Wheelchair Integrated Sensory Education**

Our interdisciplinary team includes researchers from Psychology, Computer Science, technicians, as well as teachers working with children with multiple impairments: Polly Atkins (University of Lincoln), Jacqueline Bennison (St Helens Borough Council' Education and Learning. TESSA Vision), Dr Patrick Dickinson (University of Lincoln), Dr Craig Green (University of Lincoln), Emma Hawes (University of Lincoln), Dr Kieran Hicks (Staffordshire University), Prof. Timothy Hodgson (University of Lincoln), Laura Miles (St Francis Special School, Lincoln), Dr. John Patterson, (St. Vincent's School, Liverpool), Dr. Jonathan Waddington (InFocus Exeter; Plymouth Marjon University), and Caitlin Williams (University of Lincoln).

#### **Summary of the project:**

This project aims to co-design a multisensory neural technology device in collaboration with children aged 6-12 with varying impairments, including children with severe communication difficulties. Children will interact with our newly developed multisensory device, a six-button box, representing an enlarged braille cell. The device can produce sounds, haptic vibrations, and auditory-haptic vibrations. To interact with the device, users can place their fingertips on the buttons, press them and experience different intensities and patterns of haptic vibrations and sounds. Based on children's preferences, we aim to haptically "enrich" the device, tailor interactions and use neural measurements to record automatic responses such as the so-called somatosensory Mismatch Negativity (MMN). The MMN occurs in the time range of 100-200 ms and allows the detection of rare sensory stimuli from frequent ones. We aim to test the research hypothesis that frequent device interactions in an engaging way might lead to improved sensory experiences and enhanced neural detection mechanisms for sensory patterns in children with multiple impairments.

