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Bespoke product design and manufacture for disabled children: A case study of products and their perceived effectiveness on user wellbeing.

This paper will demonstrate how user-centred design and small scale/bespoke manufacture addresses a significant gap in mainstream provision of equipment for disabled children, enables social inclusion and promotes wellbeing.

The Cerebra Innovation Centre (CIC) team provide a bespoke product design service for the children with neurological disorders where off-the-shelf solutions do not exist or do not address the complex needs of the child. Consideration is given to creating physiologically and aesthetically appropriate products that not only fulfil the physical brief but also address an important human-centred approach to inclusion and acceptance. These products enable mobility around the home and school, products to enhance and enable play, aiding interaction and social inclusion.

This approach to design has been validated through user-feedback research that indicates that in many instances CIC's approach to design-to-make supersedes expectation and has resulted in boosting the child's confidence and health.

The methodology employed is a case study review of products and their perceived effectiveness on the wellbeing of a child.

In an industry which has been playing catch-up to the rest of the world and a 21st century addiction to high end aesthetic and highly functional products, CIC have sought a niche market responding to individual requests for a product. CIC designer/makers tailor a product to the specific needs of that person. Using mainstream aesthetic and product design principles, high technology and traditional workshop tools, CIC provide high quality bespoke manufactured equipment which provides improvement over existing product solutions, helping children achieve targets which were previously thought impossible.

Case study 1:

Not being able to wear ice skates but being invited to an ice skating birthday party resulted in the development of a bespoke ice sleigh. 3D computer aided design and CNC manufacture enabled unique and It was found that the young girl enjoyed a fantastic and elating party by being included with her peers that she otherwise would have been forced to miss, or spectate at.

Case study 2:

A young man whose school class attended weekly horse riding lessons was unable to partake due to his unique head shape and consequent lack of availability of an off-the-shelf sporting helmet. CIC employed high tech applications; 3D scanning, computer aided design, 3D printed moulds, CAD-CAM production and fibreglass/Kevlar composites to realise a BSI approved riding helmet with exact fit. He was able to enjoy the manifold benefits of horse riding, including health, fitness, relationship with animals and inclusion with peers.

Case study 3:

A young lady with quadriplegic cerebral palsy asked for assistance to participate in triathlons with her father. CIC responded with a stable yet hydrodynamic boat and unique running chair that transforms into a bike trailer. The equipment is high tech and sporting in appearance and function. Her father towed and pushed her around the course. She experienced medicinal benefit from the motion, a gain in confidence and considers herself an ambassador for cerebral palsy.

These case studies demonstrate the ability and effectiveness of excellent small scale design and manufacture to change lives and deliver wellbeing and health benefits through inclusion and ability to access activities that were previously out of reach.