

Breaking down communication barriers for children with cerebral palsy

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EU scientists with the ABC project have developed a ground breaking application that can help people with cerebral palsy to communicate and interact with others.

People with Dyskinetic cerebral palsy (DCP) – around 15 % of all cerebral palsy cases in Spain – cannot speak or express themselves despite having their intelligence preserved, because they have no motor control. This makes it difficult for them to establish relationships with their environment and with other people, which for children can lead to developmental problems.

The three-year EU-funded ABC project, completed in October 2014, sought to address this challenge by developing an easy-to-use [communication](#) system based on a brain-computer interface. This 'ABC Communicator' is now available as a free-of-charge app for Android tablets, and is configurable in any language.

This ABC communicator app is used in conjunction with inertial sensors (similar to mobile phone technology that registers activity) and an electromyography system (EMG) that can detect the voluntary contraction of muscle and brain. With these devices, a child with cerebral palsy can express his or her needs, which are then displayed on the tablet.

The system also contains a skin sensor that can detect five emotional states such as positive (high and low intensity), neutral and negative (low

and high intensity). So in addition to offering a clear communication channel with the outside world, the ABC system also opens up the possibility to better understand the emotional state of children with DCP.

The children themselves will have the benefit of being able to express their state of mind more clearly, removing frustration and helping with their emotional development.

The ABC system also includes a health module that works like a sports bracelet, controlling vital signs such as pulse and breathing. Taken together, the technologies offer huge potential in improving communication and learning and increasing social participation for children with [cerebral palsy](#).

DCP end-users and care professionals were involved throughout this project, from design through to validation. In order to effectively involve individuals with DCP in the design process, new user-centred design methods were developed.

In addition to being proven effective, the project's results are also highly accessible. The devices used in the ABC application include products that can be easily purchased at specialised stores, which means that the quality of life of thousands of children with DCP can be improved. Given the importance of communication and interaction in normal child development, the benefits of this technology will likely be felt for years to come.

The modular structure of the ABC system and the independence of each of the components also mean that the potential of the project could extend beyond the initial DCP niche. For example, different combinations of modules could be integrated into other assistive product niches such as those for people with Multiple Sclerosis. ABC modules

also have potential in mainstream [applications](#) such as e-learning, work safety and driving assistance.

More information: For further information please visit ABC:
www.abc-project.eu/

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