

<b>CHALLENGE</b>	<p><b>Creating an inclusive environment for children with multiple disabilities</b></p> <p>How can we ensure accessibility and participation for children with multiple disabilities so that, based on their abilities, they can control their natural environment and develop their autonomy?</p>
<b>CHALLENGE FACILITATOR (LOCAL AGENT AND TEACHING TEAM)</b>	<p>Local agent: Nexe Fundació</p> <p>Teaching team: David Rodríguez Gómez, Universitat Autònoma de Barcelona Daniel Franco Puentes, Universitat Autònoma de Barcelona</p>
<b>TOPIC</b>	Disability, accessibility, and assistive technology
<b>OFFER (local/ECIU)</b>	ECIU
<b>CREDITS</b>	3
<b>STUDENTS (number and affiliated universities)</b>	9 (1 DCU, 1 UAB, 2 KTU, 2 TUNI, 3 TUHH)
<b>STUDENTS' FIELDS OF STUDY</b>	Philosophy, Computer Science, Engineering, Social Sciences.
<b>STUDY PERIOD</b>	From April 7 to July 4, 2025
<b>STUDY FORMAT</b>	Blended (blended learning): includes real-time online sessions and in-person activities at UAB Barcelona
<b>METHODOLOGY AND FORMAT</b>	<p>Two international and interdisciplinary teams worked using the Challenge-Based Learning (engage–investigate–act).</p> <p>Activities include problem analysis, fieldwork, feedback from families and professionals, and regular sessions with the teaching team and Nexe Foundation.</p> <p>The methodology is based on Design Thinking, combining analysis of the problem, fieldwork, and contributions from families and third-sector organizations. The aim is to develop accessible technological and digital solutions (such as voice, gaze, pressure, or proximity sensors; pictograms on tablets; or RFID technology) that allow these children to interact with and control their environment (lighting, sound, water, electronic devices).</p>

<p><b>PROPOSED SOLUTIONS</b></p>	<p>The two teams developed innovative proposals to enhance accessibility and autonomy for people with multiple disabilities.</p> <p>One solution introduces a facial expression-based Augmentative and Alternative Communication (AAC) system, using low-cost technology (Raspberry Pi, OpenFace, OpenCV) integrated with smart home devices. This tool allows children with severe motor and communication impairments to express themselves through pre-defined facial gestures while also interacting with their domestic environment. Benefits include increased autonomy, affordability, accessibility, as well as greater dignity and inclusion.</p> <p>Another proposal is the development of <b>MayAIGo</b>, a mobile application designed for people with disabilities and their families. The app enables users to find and review accessible businesses and organizations, considering not only physical access but also factors such as sensory environment or sign language availability. It also provides support tools such as personalized storyboards to prepare visits and a community network to share experiences and resources. This solution reduces anxiety, increases confidence, and fosters social participation.</p> <p>Together, these proposals address the challenge of building more inclusive, accessible, and personalized environments, placing technology at the service of the real needs of people with disabilities and their caregivers.</p>
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