

Playing with Music: Developing an Inclusive Digital Musical Game for Children with Cerebral Palsy

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Cerebral palsy (CP) is a condition often linked to physical limitations, and it is the most common cause of motor abnormalities seen in infants and children¹. However, there is a lack of resources and opportunities to help those children learn music in an accessible environment². The aim of this research was to investigate the use of eye-tracking devices to create an educational musical game that allows children with motor limitations (especially CP) to learn music while playing. The project was produced in collaboration with an Artistic School of the Music Conservatory in Portugal, which has a child student with CP and there was a need to more available material to support their music education. The eye-tracker device used was the *PC Eye 5: Tobii Dynavox*³, provided by Altice labs⁴.

The project followed a Design-Based Research method, collecting data through usability tests, interviews, and observations. The developed game “Playing with Music” is already being used in the children’s classes in Conservatory of Music to assist in their classes. It was split into two different versions (Figure 1): (1) Play with Piano is similar to a simulator, where the player can interact with a virtual piano, create custom songs with notes appearing in a musical staff, perform musical challenges, play beats, change the instrument’s sound, as well as the Beats Per Minute (BPM). (2) Musical Spaceship consists of a puzzle version, where the player needs to build a path for a ball to pass with objects that

allow the game to play a song shown on the musical sheet. Both versions collaborate on the music teaching through creation, practice, exploration and creativity. The game was presented in Aveiro Tech Week 2024 for multiple people to play with their eyes (Figure 2). Analysis of comments and gameplay performance suggests eye-tracker devices offer a viable, accessible way to interact with applications. The project not only addresses the social need for this assistive technology, but also contributes to identifying the challenges when developing eye-gaze applications.

References

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FIGURE 1

Play with Piano and Musical Spaceship, respectively.

FIGURE 2

Play with Music being presented in Aveiro Tech Week 2024.

