3D Tune-In (3DTI): Evaluation of games to improve knowledge of hearing aids in children with and without hearing loss.

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Introduction

3D Tune-In (3DTI) is a European project aiming to improve users' knowledge of their Hearing Aids (HAs) and sensitising the general population on the issues experienced by HA users.

Two apps were created for children: Dartanan for HA users and Darius' Adventure for non-HA users.

Apps

Dartanan

Dartanan, developed by XTeam, aims to educate children on the usage of HAs. The app has been designed to engage children and to gather data in order to verify the settings of the users' HAs.
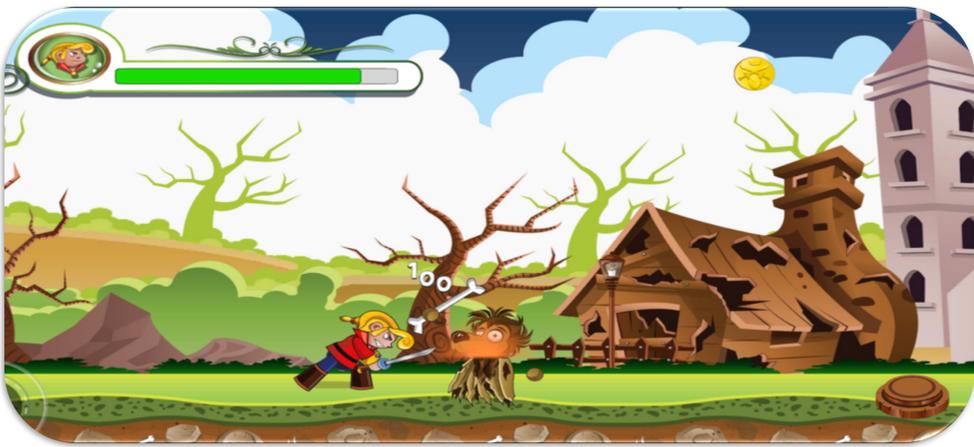
Darius' Adventure

Darius' Adventure is a graphic adventure game designed by Nerlaska studio to educate non-HA users about hearing impairments and about the challenges faced by individuals with hearing loss.

Method

A total of 32 children (six with HAs) played with and explored the functionalities of each app for 30 minutes and then took part in paired interviews in the UK, Italy and Spain. They answered questions on audiological aspects, game mechanics, game story, usability and accessibility of the apps.

The interviews were transcribed and thematic analysis was carried out on the data. A series of actionable changes for the app developers resulted from the analysis.

Results

Dartanan
- Audiological aspects
The participants suggested increasing the connection between the game and audiological aspects, for example, by further promoting the use of hearing rather than sight.
- Game mechanics, game play and game story
The main suggestions included possibilities for customisation, the need for an explanation of the purpose of game objects, and modification of the story to add a final, overarching aim. Other suggestions referred to difficulty of parts of the main game and the mini-games.
- Usability, aesthetics and accessibility
The participants suggested solving some graphics inconsistencies, to add a pause button and to make some of the game objects more clearly visible.

Darius' Adventure
- Audiological aspects
The main changes suggested refer to characters' voices (text-to-speech), which were considered unnatural, and the addition of more auditory contexts (e.g. a classroom, a mountain).
- Game mechanics, game play and game story
The participants suggested changes mainly regarding movement of the main character, the interaction with secondary characters and the introduction of a set of instructions.
- Usability, aesthetics and accessibility
The main suggestions from the interview were to fix some bugs, add a map of the different scenarios and add the possibility to customise the main character.

Discussion and Conclusion

The interview analysis resulted in a list of actionable changes that were sent to each developer to improve the end-users' experience of the apps.
In general, the children participating in the evaluations liked both of the apps, found them engaging and expressed an interest in using them once they are released. However, some changes are required to further highlight the apps aim to teach people about HAs and hearing loss and to ensure that the audiological aspects of the apps are clear and understandable.

The results of the evaluations highlighted how children were very receptive to learn about hearing loss and HAs and the challenges experienced by people with hearing impairments. The apps could also help HA users to learn more about different HA functionalities.

Overall, the participatory design approach that the 3DTI project used helped the process of development by highlighting issues experienced by end-users, which could be addressed prior to the final release of the apps. The iterative development and evaluation allowed the developers to enhance their apps' user experience and meet users' requirements.

Future Steps

The apps are in the final stage of development and the issues discussed in this poster are currently being addressed. Two more cycles of evaluations will be carried out, both by experts and by end users. The final version of the applications should be available by May 2018.