Supporting the personal autonomy of children with autism spectrum disorder: a software system design and development

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1. Introduction

Technology attracts the interest of children with Autism Spectrum Disorder (ASD). Health professionals and developers are interested to design programs facilitating daily lives of individuals with ASD (Den Brok & Sterkenburg, 2014). However, some special requirements must be considered on software design process for people with ASD (Porayska-Pomsta et al.,2012).

2. Objetive

To describe principles and decision making of an interactive software design process for children with ASD.

3. Material and Methods

This research focused on software development and design process of ASD Module, a free software for children with ASD. This process was based on scientific evidence study and consultation/testing done by participants:

- 1st Group: Professionals with experience in the intervention with people with ASD. The study involved 20 professionals who were recruited from centers of direct care for people with ASD.
- 2nd Group: Professionals with experience in the development and design of technology for disabled people. The project involved 13 professionals recruited from two centers that make use of the technology applied to social and/or health context.
- 3rd Group: Family members of people with ASD. Participants were 3 direct relatives of people with ASD.
- 4th Group: Children with ASD. In the final phase, 3 children (two boys and a girl) participated, aged between 10 and 13 years old, and diagnosed with autism disorder according to the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV).

Data were collected using observation, interview and group discussions. Software development has been based on user-centered design and on iterative procedure.

4. Results and Discussion

The study results are a design guide that includes evidences, basic ideas and suggestions for ASD Module. It was translated into 10 guidelines for consider when developing technology for people with ASD.

1. The software and its contents are based on a person's abilities, desires and interests.
2. The design of the interface is simple and the information displayed is simplified.
3. Use of images to display information.
4. The images used convey the meaning of the actual element.
5. The use of images allows users to adapt according to their level of visual cognition.

4. Results and Discussion (cont.)

6. The image is accompanied by the written word.
7. Speech synthesis is used to facilitate communication or as reinforcement to the command.
8. The information is displayed in a multimodal way (visual and auditory) and is adapted according to the sensory style preferred by each child.
9. The background color is used to facilitate the information processing.
10. The user has the possibility to customize all relevant aspects.

Future research is need, focused on quantitative measures of large samples of children with ASD' responses to stimuli related to software design, and also about the meaning that children with ASD, families and professionals give to technology as therapeutic tool.

5. Conclusion

These guidelines for technology design provides useful information for researchers, developers, social/healthcare professionals and families, aiming to help children with ASD to easier understanding daily life.

6. References

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- Porayska-Pomsta, K., Frauenberger, C., Pain, H., Rajendran, G., Smith, T., Menzies, R., et al. (2012). Developing technology for autism: an interdisciplinary approach. *Personal and Ubiquitous Computing*, 16(2),117-127.

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