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DESIGN FOR CHILDREN WITH PHYSICAL AND MENTAL DISABILITIES - THE ASD SYNDROME

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Abstract: *This paper deals with a very important subject for present society. It is about helping people having certain types and degrees of disabilities to integrate into society, to have a normal life and reducing their necessity to relay on other people's support. This is the case of people suffering from ASD syndrome, which incidence has increased in the last period. Many children having this disability can be helped to grow up as almost normal adults. Through design these children can be helped and this paper shows how this action can be performed.*

Key words: *ASD, autism, communication, disability, design.*

1. Introduction

Sometimes, designers are confronted with special situations according to their customers needs. This is the case when designing for people with different kinds of disabilities. Autism is a disorder that affects an increasing number of persons all over the world. There is a large and unfortunately growing number of people that are affected by autism (1 of 110 in the UK, in 2007 [4]). The causes of autism are yet unknown but the research into this area has developed methods of educating and interacting with children that have autism, in order to improve their social behaviour.

Autism is a lifelong developmental disability. It is part of the autism spectrum and is sometimes referred to as an autism spectrum disorder, or an ASD [4]. The word 'spectrum' is used because, whilst all people with autism share three main areas of difficulty, their condition will affect them in very different ways. Some are able to live relatively 'everyday' lives; others will require a lifetime of specialist support.

The three main areas of difficulty, which all people with autism share, are sometimes known as *'the triad of impairments'* [4]. They are:

- Difficulty with social communication;
- Difficulty with social interaction;
- Difficulty with social imagination.

Therefore, the disability of people affected by ASD is related mainly on difficulties in developing *social interrelationships.* This will stop them to have normal understanding of the world around them and to interact with other people. This is why people involved in social services must consider improving

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social interactions with autistic people and help them to better understanding the world in which they live. People with autism have difficulties with both verbal and non-verbal language. Many have a very literal understanding of language, and think people always mean exactly what they say. They can find it difficult to use or understand facial expressions or tone of voice, jokes and sarcasm, or even common phrases and sayings.

Nevertheless, the research and study of this disorder proved that when discovered, with proper intense care, the life quality of people affected could be significantly improved. This is why, working with children suffering from autism might give them a chance with a little bit of extra care. Fortunately, designers can be part in this synergic effort.

This paper is part of a project which research was developed by Ariana, as an Erasmus student at Plymouth University, UK, and developed as graduating project at *Transilvania* University of Brasov [1].

2. Design Strategy for Children with Special Needs

Design is about creating and developing products according to people's need. The designers' main task is to understand the needs and this job is becoming difficult in the case of people having problems in communicating these needs; this is the situation with people suffering from ASD.

Transforming the need into a solution that can successfully satisfy the real need requires an appropriate design process.

Inclusive Design is neither a new genre of design, nor a separate specialism. It is a general approach to designing in which designers ensure that their products and services address the needs of the widest possible audience, irrespective of age or ability. Two major trends have driven the growth of Inclusive Design (also known as Design for All and as Universal Design in the USA) - population ageing and the growing movement to integrate disabled people into mainstream society [3].

Particularly, the 'customers' in our case are the children, and not any children, but some who need special attention and care. Therefore, the study focused on creating playing objects which could be used as therapy as well [2]. Ergonomics was also important for the toys to fit the users and ensure their safety. The same considerations have been taken into account when choosing the most appropriate materials, dyes and processes to build the products.

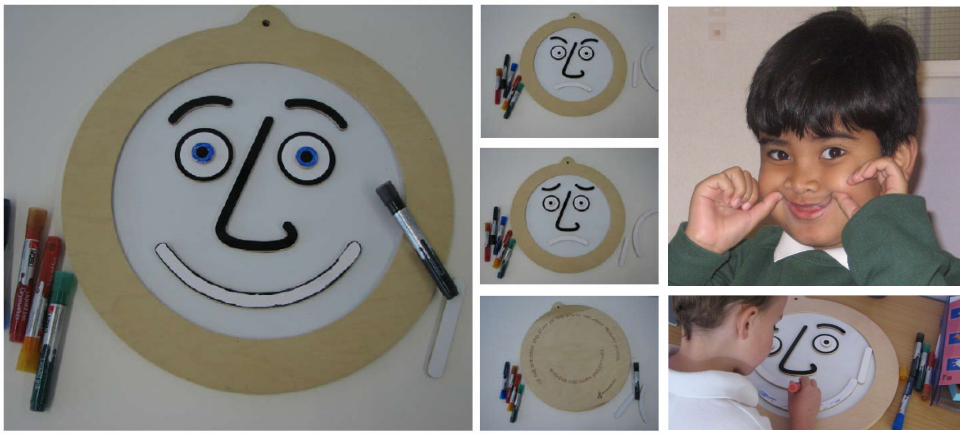

Fig. 1. *Toy developed for creating the face expressions*

3. Body Language

Body language is a term used to describe communication using body movements or gestures instead of, or in addition to, sounds, oral language, or other ways of communication. Body language can also incorporate the use of facial expressions.

It forms part of the category of paralanguage, which describes all forms of human communication except for verbal language. This includes the most subtle movements that many people are not aware of, including winking or slight movement of the eyebrows.

Although they are generally not aware of it, many people send and receive non-verbal signals all the time. These signals may indicate what they are truly feeling. The technique of 'reading' people's faces is frequently used.

For the autistic people, understanding body language can be as hard as understanding a foreign language. They need to be taught to understand body language and facial expressions.

Not being able to understand body language has a very strong impact in the lives of autistic people, this influencing their social communication and also the social imagination. Therefore, it is very important for them to get to understand body language and then to connect this with feelings and experiences, so when they appear in a conversation they can make the link between words and mimicry.

That was the objective when creating the first object: training the children to recognise and to express feelings. The modular construction permits the children to compose faces using eyebrows, eyes, nose and mouth according to the feeling they want to express: anger, happiness, surprise, sorrow, joy etc. This is why the toy face was called 'I am…' (see Figure 1). Moreover, the child can draw hair, can colour the eyes, lips and so on.

The product is made of wood, which is a cheap and friendly material, easy to process, covered with a ferrous metal sheet. The modules can be attached to the face, using small magnets.

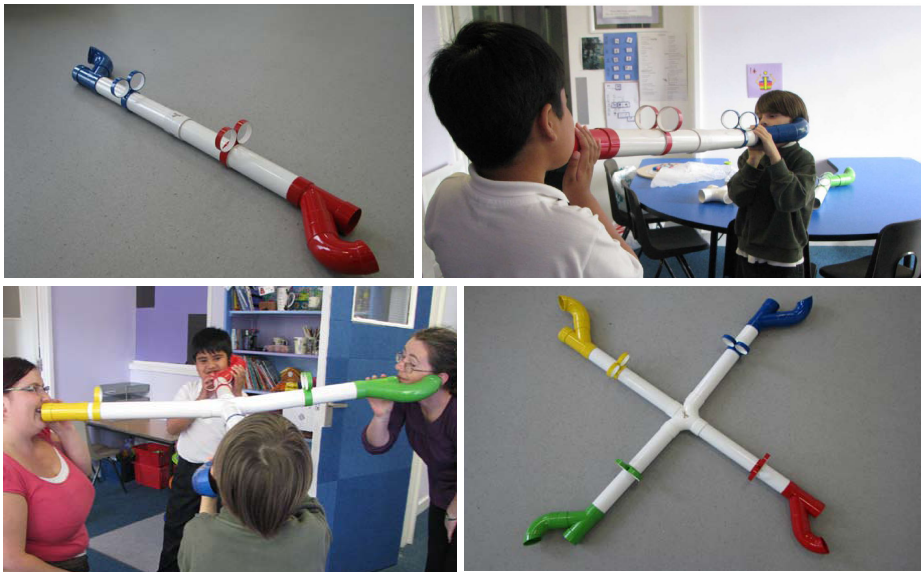

Fig. 2. *The communication tube*

4. Communication Disorder

Dysfunctional communication is one major problem for autistic people. Most often, these people have difficulties in communicating with other people, either autistic, or not. The communication problems of autism vary, depending on the intellectual and social development of the individual. Some may be unable to speak, whereas others may have rich vocabularies and are able to talk about topics of interest in great depth. Despite this variation, the majority of autistic individuals have little or no problem with pronunciation. Most have difficulties effectively using language; many also have problems with word and sentence meaning, intonation, and rhythm.

For children, this situation could be improved by encouraging them in this endeavor. Most of the autistic children begin talking late, at 5 or 6 years old. When talking to them, one need to put in front of the sentence the name of the child otherwise they might not realize that that person is talking to them. Children should be taught what to say and how to say it. Also, the position of the body should be corrected; they are encouraged to look at, and to come closer to the person they are talking to.

One important observation during the research was that usually children with autism have a poor eye contact, meaning that they do not feel like looking at the person they are talking to.

This last aspect suggested the idea for the next object. It was created as a toy and considering communication a funny and joyful activity [5]. The product was created in two variants: for two users and for four users (see Figure 2).

The object construction is very simple: one tube that has at each end a part with two channels, one for mouth - speaking and the other for ear - hearing. In front of each user, there is a sort of goggle having the function to attract the child's attention and therefore, force him to look through it towards the person whom is speaking to.

The product is therefore encouraging social interaction, keeping the children at the right distance, whilst building the eye contact during communication.

5. Conclusions

Through design, we can build the link between people, what people desire/need, and solutions/products. The aim of this paper is to better understand what autism is and help the children with autism and the people around them with products that will support the sensitize and desensitize process. Also it will help understanding the face expressions and communication.

There is a lot more that can be done to improve these people life and products can be developed not only for autistic children but also for people that are affected by other disorders.

Another important issue of this paper is to raise people's awareness for people with hidden disabilities, who are often misunderstood by the society and, therefore, discriminated.

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