

GAMIFICATION OF PSYCHOLOGICAL TESTS FOR LITERACY AND SPACIAL SKILLS OF CHILDREN WITH AUTISM AND DOWN SYNDROME

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1. Context

In spite of the elevated number of patients who suffer with cognitive diseases, the lack of treatments currently affects their development of social and learning skills. The same equal chances are not given to patients and nonpatients, especially when focused on the younger ones. With that in mind, professionals in different areas of knowledge came together in order to attempt the creation of products that would further improve chances and opportunities in the assistive technology area.

The importance of proper treatment and guidance for children who have the disease is shown when their participation in society is sidetracked or faces certain problems given the fact that they have a disease. The necessity for their social inclusion along with knowledge about what the diseases actually are and how they work by spreading around society, brought to light how deficient the area of proper treatment is. Schools were not ready for the influx of children with special needs being enrolled, change was desperately needed.

The objective of this research and creation of a solution IS to present the development of a board game which was thought up and set in motion to encourage kids who have cognitive diseases to participate in activities related to learning such as reading, writing, motor and social recognition. Motor and social recognition is responsible for knowledge of one's body and its extensions together with correlating previous pieces of information to the world around them, for example: knowing a shade of color and pointing to an object that is also the same color.

The game should serve as a tool that enables health professionals to collect crucial information about the patient as well as how their reality works, allowing the professional to properly address and treat the child's needs as well as direct the family to another doctor, if needed.

2. Method

The purpose of the research was to create a tool in order to aid health professionals in the neuropsychology area, the method used in the study was the ergonomic intervention by Anamaria de Moraes e Cláudia Mont'Alvão. It was chosen as it offered enough methodological aid to analyze the workplace situations that would lead to creating a solution for all problems. While following the fundamentals of the method, observations and notes were taken and kept to help with the project.

The development of the project consisted of a team of four designers in a partnership with a center of rehabilitation in the city of Niterói, in Brazil. The area of neuro psychopedagogy was chosen, which led to the analysis of five patients diagnosed with Down Syndrome and Autism Spectrum. The duration of the project was four months and the analysis of the children's treatments sessions happened twice per week, with one or two members of the design team present.

All the data collected was gathered during sessions of thirty minutes, alternating between each of the five patients per week. During the analysis, photographic registers were taken, along with videos and measurements of time in order to know how the time management of each session worked. Interviews were also used as a way to collect information and increase knowledge about the patients and the difficulties they faced during sessions. This led the team into more specific details about activities made during sessions, posture problems and everything concerning the children's interactions with the activity proposed, from the moment it was proposed until its complete execution. Every detail regarding the interviews and concerning evolution as well as behaviours of the patients related to the activity was considered in order to create and adjust the project for the children's treatment.

3. Results

With all the data collected throughout the analysis and the patient's weekly visits, core problems for the development of sessions began to reveal themselves. Situations, such as the patients reacting badly to an activity the professional selected for that session and not wanting to complete it; convincing the patient to actually do what is asked, suggested stubbornness sometimes related to the syndromes. One major problem noticed and pointed out by the therapists was the fact that activities related to math and spatial recognition were small in numbers compared to most games that were bought in conventional stores which made them complicated for the kids to understand. This led to the session being compromised.

With all of that in mind, the team began to think of a particular solution: a game designed to make the patients feel like they were setting out for a big adventure after a pirate treasure, counting with rather flashy colors and cartoon characters to draw more attention to it.

The board developed had four separate sections in order to give the option of shortening the duration of the round if needed and to help with storing it away; the 'x' which signaled the end of the round could be moved so the therapist had more control over the duration.

Four levels of difficulty were created, which contained forty normal cards and ten challenges. Those levels were based on Machover psychological tests, known as the human figure test, Goodenough Test; that determines the patient's intellectual maturity and Psychometric Tests, which measure the coefficients attention span, memory and reading abilities.

The first level was thought for illiterate patients. The main focus was their drawing competency in order to understand how the patient's mind worked and allowed the professional to deepen their knowledge on their daily life and how the kids relate to it. The challenge card presented simple mathematical expressions, subtraction and addition, together with simple physical interactions, such as touching their hand to their head.

The second one was projected to kids who were learning how to write. Counting with simple syllable divisions, one of the level's focus points was the possibility of finding signs of dyslexia, which accompanies the syndromes studied during the research. The challenge cards were the same as level one.

Level three cards had drawings that represented different situations in order to see how the patients understood the image in front of them and consequently get a bigger picture of how their minds works. An example would be a card that has a boy riding a bicycle which would allow the patients to show their personal view of the situation. The challenge cards were also more difficult as the mathematical operations became multiplication and division with motor cards added to help the kids connect something around them to a previous knowledge, like a known color to an object around them.

The fourth and last level had a focus on thought organization, creating a sentence from scrambled words. The patient would be given a card and had to form a sentence with the words in it. Through the processing of their thoughts, the therapists could reorganize the activities and make it more fitting to the patient with them. The challenge cards contained the mathematical ones with simplifications of fractions and the motor ones that related body movements with the space around them.

The validation of the product happened in two different situations; the first one was through a mockup in order to know the necessary changes, everything was placed in order to help the therapists better control the flow of the session.

The second moment of validation came after the final product was ready and tested with the patients, the feedback the group got was positive. The flashy colors and cartoons got the kids interested, along with the idea of finding a treasure at the end of the round, the rules were well understood by them, and in general, the kids showed more interest in completing what was asked.

4. Conclusion

Following all the studies made concerning the theme of the research, the final product came into play as an important tool to help with giving the necessary attention to some syndromes that exist in society. Products aimed to the area of learning for special needs children are rare and can be extremely difficult to understand which leads to most being uninterested.

While accompanying the patients with their treatments and with the therapists help, it was possible to get a deeper understanding of the problems that happened through sessions and then find applicable solutions. At the end of every session both therapists and patients were asked about their opinions, the latter feeling more important as they were an active part of the game development. The ergonomic intervention method was beyond important to finding the issues and making the project a success.

The final positive point was how the game helped the patients believe in themselves more recognizing their abilities and helping with their self-esteem.

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