

PROTOTYPE DESIGN OF REMOVABLE SWING SEAT FOR CHILDREN WITH DISABILITIES

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ABSTRACT

In every country institutions must offer to the children with disabilities services and activities to help them get involved in everyday life. Children with disabilities are like all others with needs, limitations and dreams. Society and institutions need to ensure them infrastructure for free access to necessary public services and assist parents and/or tutors in their efforts to provide all the care, attention and support to the children's needs and help make their dreams come true.

Starting from an idea to help children with disabilities have fun and be socialised in amusement city or school parks, it was designed a model and manufactured a prototype of removable swing seat. Removable swing seat will enable parents or tutors easy transport of a child from home to the park and set it to a swing frame.

In this paper phases of the model design and decision making process from idea to implementation – prototype manufacture of swing seat, are presented. Careful definition of the design problem, search and generation of alternatives, analysis of the loads, selection the best solution based on analysis and criteria (age, weight, material, environment, level of disability etc.) have been taken into consideration.

The prototype was tested by a parent/mother and her six-year old son at the Prishtina city park.

Prototype evaluation was made by parents and school tutors through a survey with a written questionnaire. The answers of about hundred respondents show that the idea and device was positively accepted, device is easily removable, generally fulfils sitting conditions with useful remarks on special needs of individual child concerning to level of disability.

Results of survey are graphically presented and are a good base for upgrade and further development of the model.

Keywords: Children with Disabilities, Removable Swing Seat, Design, Decision Making Process

1. INTRODUCTION

Society is based on the assumption that all people, without exception, can move quickly on the road, are able to see the signs, to read directions, to hear announcements, to press buttons, have enough strength to open heavy doors as well as to perceive and interact with the environment in a normal way.

Disability is the consequence of a person who has suffered damage, whether physical, sensory, neurological, psychiatric, and intellectual or of another nature, and relates to the interaction between the disabled person and the environment that surrounds it. It is felt more when a group of people raise barriers and obstacles by planning the construction of a world only for themselves not taking into account the damages they have suffered other fellow.

People and groups of people cannot and should not prejudice from a particular aspect of their lives - be it race, gender, age or injury. Practices used by many institutions, do not enable people with disabilities to access and perform actions that other people can do with safety.

In this paper is elaborated a decision and a design process of a swing seat prototype for children with disabilities that may help them to enjoy, have fun and socialize with other fellows in parks of the city. The task was quite challenging, interesting and above all human. The respond by parents, tutors and educators of the children was positive with interesting proposals and remarks.

2. SWING SEAT PROTOTYPE DESIGN

In the paper are analyzed and discussed in detail all the phases of the removable swing seat prototype design for persons with disabilities, from the idea to its final production. The prototype of this device is adopted for children with special needs up to the age of 10 years.

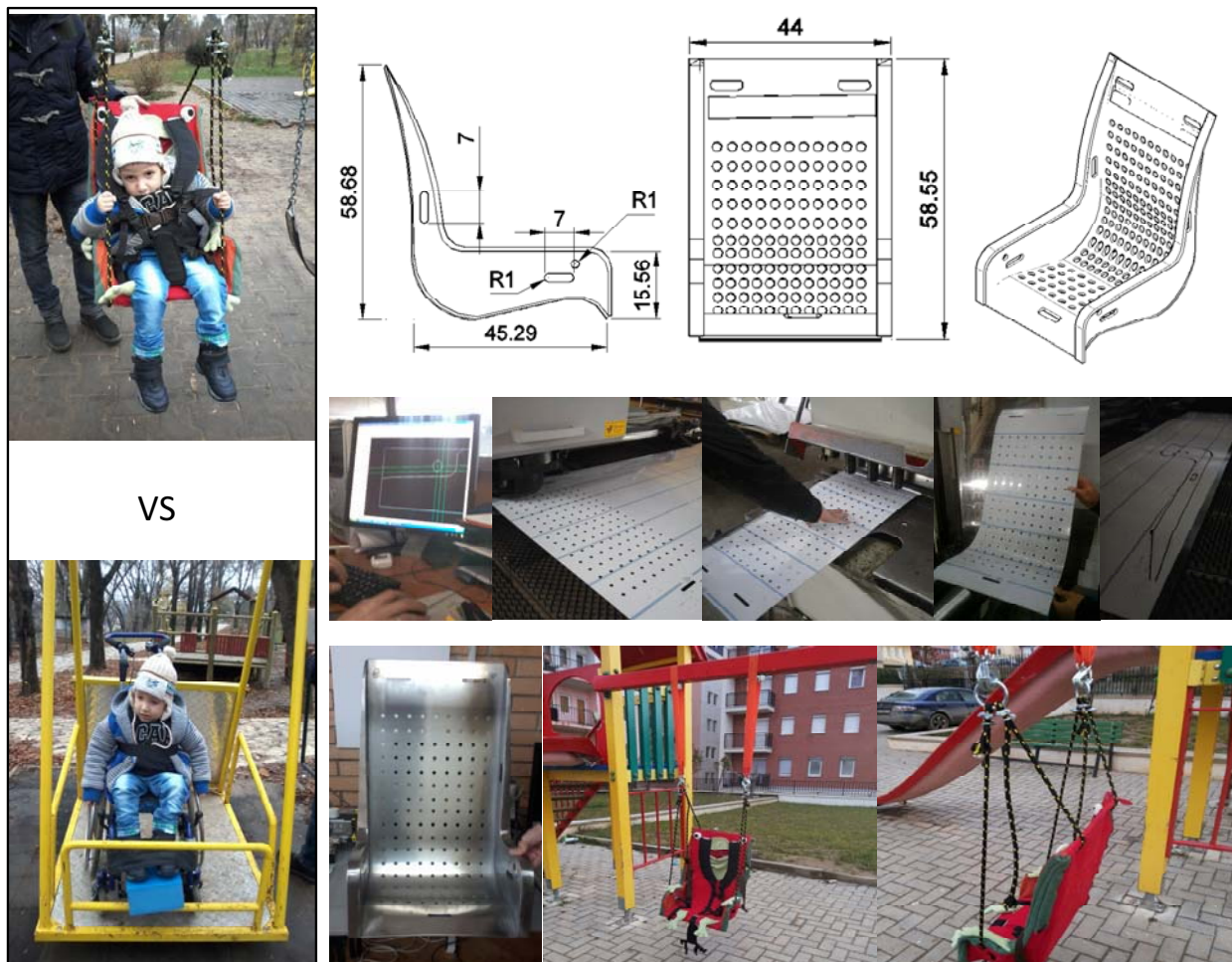


Figure 1. Removable swing seat versus swing cart (left). Process from design to prototype of removable swing seat

Since several months ago in Prishtina were built and set up in the city park and other playgrounds few swing carts for wheelchairs, where the child should be placed with wheelchair in the swing cart, figure 1 (left-down). But such an opportunity does not have children with disabilities in the other towns or villages of Kosovo. Also, the fact that the children with be in swing cart with wheelchair, a device that they use in everyday movement, inspired an idea to design a swing chair that will allow children of this category feel closer to the other children, not isolated from them, to experience the feeling in swinging and will be able to enjoy it wherever other children enjoy, figure 1 (left-up).

Starting from this alternative of removable swing seat vs swing cart, the process from design to prototype includes the following phases:

- Setting for choosing the "best" – decision,
- Modeling prototype of swing seat,
- Design and creation of prototype,
- Analysis and evaluation of prototype,
- Manufacture of the prototype (in factory “Frigostar” in Xerxe), and
- Testing the prototype in real environment.

During the design process the main challenge remains the adaptation of dimensions of swing chairs in relations to the wheelchair seat dimensions, since there is no standardization of the wheelchair which differs depending on the weight rather than age of the child. Therefore simulations, analysis and evaluation are important steps of the process. Final assessment involved testing of the prototype in the lab.

Challenges and alternatives that have occurred throughout construction and design of removable swing seat helped a lot for the emergence of new ideas for advancing the prototype model.

3. CONCLUSIONS

Conclusions are built based in design process and survey of one hundred respondents (parents, tutors and staff of “Handikos” organization that deals with handicapped persons).

Testing of the removable swing seat in city part with six-year old boy with his mother and tutor was successful and satisfactory, but it is estimated that:

- the dimensions of the seat should be changed (which is easier when having model in CAD software);
- the seating part of the seat needs to be longer and the back support part shorter;
- the holes for safety belt must change the position to ensure the comfort (it depends on level of disability of the child) , and
- the bottom holes for the placement of the rope should be modified in order to ensure better balance (equilibrium).

For more comprehensive assessment, especially from the parents and tutors, a questionnaire was prepared and distributed in a special school for children with special needs "Përparimi" in Prishtina. After presentation of the swing seat, the idea and its functions, the survey was conducted. The graphically presented results are presented in *figure 2*. The analysis of the survey shows that:

- that device is acceptable and welcomed,
- the idea was innovative,
- the design of the swing seat is creative and welcomed
- the seating part dimensions were evaluated on average, because some modifications are need, showing the same estimation as testing as well.

It could be concluded that the swing seat prototype satisfies function and security demands, needs to be flexible for different dimensions of the wheelchair seat and presents a device that is easy to be handled by parents/tutor.

Device offers to the children with disabilities opportunity to enjoy swinging and fun “of the wheelchair”.

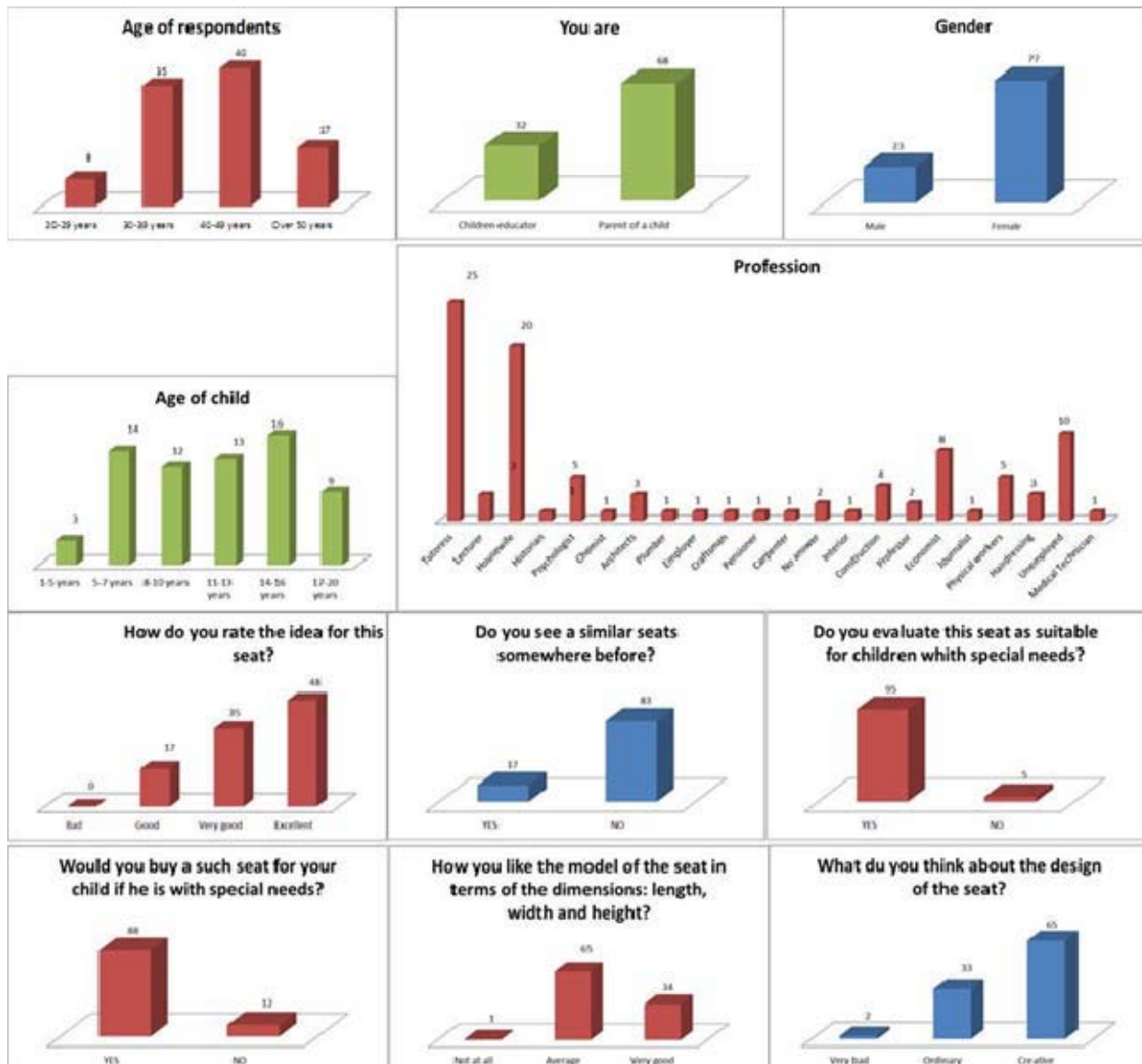


Figure 2. Results of the survey

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