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Design of a Developing Constructor for Children and Disabled Persons

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***Abstract*: A technology of a developing constructor for children and disabled persons of different age design is described in the article. The constructor combines different materials in itself and allows to reach several goals of education and adaptation in surrounding conditions for target group simultaneously.**

***Keywords*: developing constructor, sorter, magic square, children, disabled persons.**

I. INTRODUCTION

Games are the main type of perception of information about the world for a child, through them, he masters both objective activity and abstract concepts, develops logical thinking, adopts patterns of behavior and adapts to the environment. One of the most interesting, developing and informative games for a child is a constructor [1].

Unlike gadgets that have captured the niche of leisure activities for children, games with large elements from different materials do not overload the eyesight of a child who is not yet sufficiently mature for a long study of small objects against a constantly flickering background. Tactile perception plays an important role for children; it is easier for them to master abstract ideas about geometric shapes in combination with experience in objective activity [2]. Classes with sorters develop, in addition, spatial and logical thinking, fine motor skills, eye and accuracy of movements, which contribute to the development of speech.

Not all children have equal opportunities, some have problems connected with vision or motor skills. Regular constructors may not be suitable for them. In addition, not only children but also adults with disabilities can benefit from constructors.

II. PROPOSED METHODOLOGI

In this paper, I will consider a new combination of a sorter and a magic square in the shell of a unique developing constructor for children and people with disabilities. Also, this product will be made using various materials, such as stone, glass, wood, metal, plastic. This will help not only learn how to solve logical problems, but also get acquainted with the basic materials of our world for children and people with disabilities.

III. ALGORITHM

Sorters are unique puzzle games for children from 7-8 months and older, depending on the level of difficulty [3], [4]. The principle of this game is that you need to insert parts of a certain shape and size into the holes. For a child, it plays a very important role in development, as sorter require to compare, analyze and select a specific figure (Fig. 1).

Fig. 1.Varieties of sorters for children.

A similar concept is used for people with disabilities of different ages, depending on their characteristics (Fig. 2).

Fig. 2.Sorters for people with disabilities [5 - 8].

A magic square is a square table filled with different numbers in such a way that the sum of the numbers in each row, each column and on both diagonals is the same [9].

To combine these two concepts and make them more accessible or interesting, I decided to replace the numbers with symbols. With this in mind, a prototype was created (Fig. 3).

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Fig. 3.The prototype of the sorter combined with the magic square.

Fig. 3 shows that if the numbers are replaced with the simplest characters, then we get a simple and interesting puzzle with great variability. There are many build options that depend on the purpose of the toy. For example: assemble a square so that in each row and column any two characters are repeated twice or use one symbol once.

You can also play, starting from small squares, where there can be only the same elements, or two repeating or only different, depending on the task.

If you replace the characters with various materials, the constructor will not lose its properties, but will acquire new ones, such as introducing the player to the physical properties of the basic materials of this world. So, it is proposed to replace the symbols in the form of a point, a cross, a square, a triangle with metal, glass, stone and wood, respectively (Fig. 4). The base for the elements is proposed to be made of plastic.

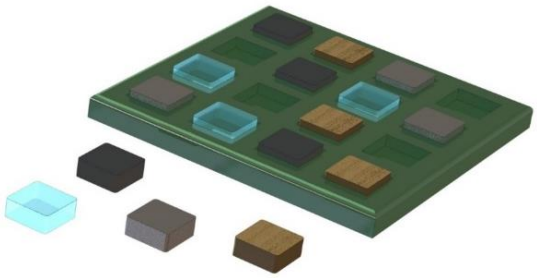

Fig. 4.Constructor mode

At the same time, the player will receive not only skills for solving various problems, but also an idea of the weight and texture of the basic materials surrounding him. In addition, this constructor is of particular importance when used for visually impaired people, since its assembly can be based on tactile sensations without visual control [12].

For sighted people, this constructor has additional aesthetic value, since regardless of the configuration of the assembly, it is a very interesting panel in the style of constructivism.

Such design solutions are very fashionable in our time (Fig. 5). The square shape will help the product to be concise and minimalistic, fit well into square living spaces. Such a product will complement any modern interior, being on a table or bookshelf [5], [10], [11].

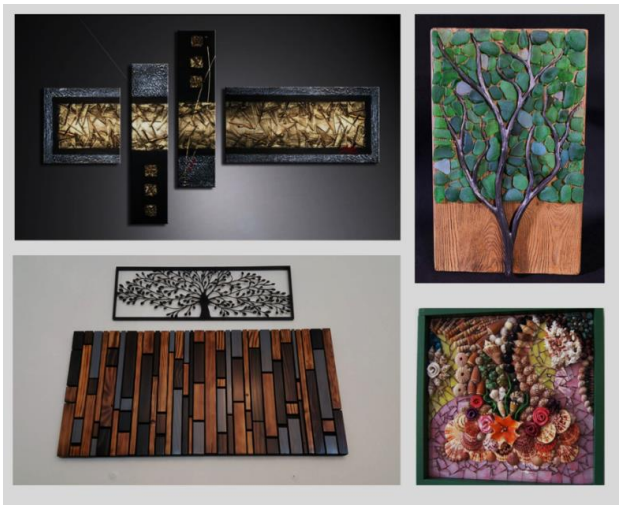

Fig. 5.Examples of panels from various materials.

IV. RESULT ANALYSIS

Such a game will be an interesting leisure for both children and their parents, and people with disabilities, because this constructor develops not only motility and spatial perception, but also the ability to build logical chains and achieve the goal.

V. CONCLUSION

Thus, a unique constructor was developed for children and people with disabilities, combining various materials and allowing to simultaneously solve several problems of development and adaptation in the environment.

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