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KINDERGARTEN FURNITURE DESIGN

Abstract: *The kindergarten furniture on the market has design problems, being rigid, in bright colors, uncomfortable, stationary and unadaptable, leading to a crowded atmosphere of the space. The choice of the space in which the furniture will be modeled was made taking into account the mutual benefits that may occur as a result of the interaction of children with the elderly. Consulting the bibliography, a zoning of the space was made, and the furniture was designed according to the areas. The socialization area proved to be essential in any kindergarten, but also the freest in terms of furniture. Therefore, in this area it was proposed to have only the sides of the room with a stable shelf, a movable whiteboard and cubes of different sizes. The cubes can be arranged in any way the children want, stimulating their creativity. The transit area is the space where children make the transition from outside to inside. In this space it was decided to place a stable closet and a mobile armchair for each child, but also pots with succulent plants, these being more resistant. The learning area is a control area, where children have tables for 4 persons, shelves for books and a pot for 2 people to work at. The furniture in this area is stable, being the space that teaches and prepares them for school.*

Keywords: *kindergarten, furniture, zoning, color, children.*

1. INTRODUCTION

The kindergarten is a class of children aged between 4 and 6 years where they develop their personality, creativity and skills [1]. The child has 3 teachers: the adult, colleagues and the environment. The environment in which man spends his childhood, both the intimate environment, the home and the social environment, kindergartens, schools is an environment that has a high emotional load for the adult. The places of childhood are the places of knowing good and evil, they are universal landmarks and models for understanding the world. The scale of our perception of these places can change over time through our very physical and emotional change [2].

The environment in which children spend 5 or 8 hours a day is important because it can become a guide or an obstacle. In Romania, state kindergartens have the same rigid and crowded atmosphere.

2. PROBLEM DESCRIPTION

After analyzing the spaces and the furniture on the market, it was found that the design directions are similar, going by the concept of kindergarten that adults know from their childhood. But the space must be changed and adapted depending on the generation.

Kindergarten furniture is designed to be stationary and is not comfortable. The height of children between 4 and 6 years is between 94 - 106 cm, but children have different growth rates depending on genetics and the environment in which they develop [1].

The colors of the furniture are in most cases very vivid. Fielding pointed out that there are no scientific studies to prove that the most suitable colors for children are vivid ones. Although most children's toys are brightly colored to attract their interest, painting an entire room in this way tends to be perceived unnatural, even by children and could have even negative effects, leading to hyperactivity and lack of attention [3].

The furniture creates the style of the room, and the existing one does not offer the possibility to adapt it to another style or another theme. Because it is not flexible and adaptable, the atmosphere in the kindergarten is monotonous.

Most of the problems are related to the design of the furniture, so the solution will focus on designing a set of furniture that solves the problems found.

3. FIELD OF APPLICABILITY

The research can serve as a tool for researching the style in which the kindergarten space and the furniture is designed, but also for the manufacture of a set of furniture following the solution, as well as for the zoning of a kindergarten space.

4. RESEARCH STAGES

The creation of any product for children must contain rigorous documentation because the little ones are still learning to interact with the world around them. Design mistakes, such as small parts that they can swallow, high parts, parts without rounded corners, can cause serious accidents. Thus, the first stage of the research is the documentation about the evolution of kindergarten classes, types of kindergarten, children's ergonomics, furniture characteristics and architectural tools.

The second stage involved the study of the existing furniture on the market and its characteristics and the zoning of a space according to the information from the first stage. After analyzing the furniture, the existing problems were identified. And the stage of creating a furniture that solves the problems found and is adaptable to the proposed areas began.

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5. METHODS USED

The theoretical documentation involved studying the bibliography, consulting specialized documents and case studies. For practical documentation were used methods such as gathering information about existing furniture on the market by analyzing the online catalogs of different furniture manufacturers, zoning the space, studying and identifying a color palette and materials suitable for children [4].

Thus, following the two types of documentation, the processing and synthesis of information, the objective is to achieve a furniture design that responds to the identified problems and its arrangement in a proposed space.

6. FURNITURE MODELING

6.1 Site selection and zoning

The kindergarten is located in a residential complex for the elderly in Bucharest [9]. Following several experiments such as the one at Nightingale House London or Bangor University, it was found that the interaction of children with the elderly has a beneficial effect for both age groups. For the elderly, an improvement in their health was observed, and the children developed their communication skills [5], [6].

The zoning of the kindergarten and the choice of materials were made so that the space is adaptable for all types of kindergarten, such as Montessori, Waldorf, Reggio Emilia, High Scope, Bank Street [7].

The kindergarten is located next to collective housing for the elderly. The whole ensemble surrounds a garden where there is a vegetable and fruit area, an area for outdoor physical activities and a park specially designed for children, as can be seen in Figure 1. The north and east walls are made of safety glass so that the children benefit from full natural light, but also to stay connected to the outside world.

Figure 1 General plan

As can be seen in Figure 2 there is a static area, which is higher with +48 cm than the class level, where the furniture is mostly made of wood because this area is for stability, and for the protection of children a folding wall of 100 cm high was placed.

The transit area is a space where children leave their clothes outside, shoes to enter the classroom. The floor in this area is not carpeted, to be easier to clean.

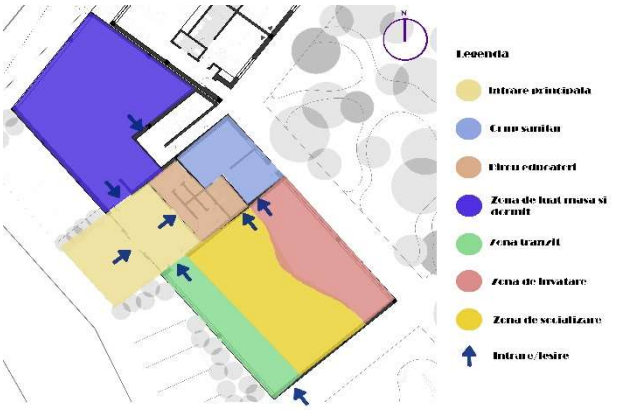


Figure 2 Kindergarten Plan

The socialization area is dynamic, mostly free to allow children to create their own space, in the side areas having all the necessary things for different projects in teams or individuals.

6.2 Learning area

The static area is +48 cm higher than the level at which the kindergarten is located with the help of steps that have a step of 30 cm, so children can use them to sit down, and a counter step of 12 cm. There will also be a 100 cm foldable wall for child safety. This area includes furniture that cannot be moved by children, to delimit a control area. The furniture is made of fir wood, being a wood with lower costs and is easier to shape [8].

The table where children work is dimensioned to fit 4 children with shelves on the sides to store their pencils, plasticine, watercolors. The space under the top is 10 cm and can be used for storage or to let their drawings dry as it can be seen in Figure 3.

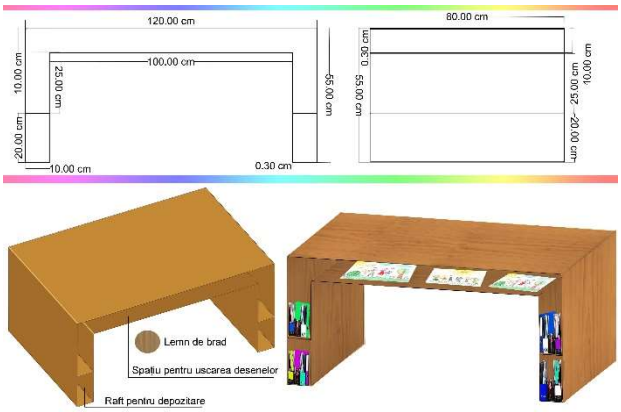


Figure 3 Table

The chair is also made of fir wood with a total height of 60 cm and a space of 30 cm from floor to seat. The space at the bottom is used to store 2 types of pillows, as it can be seen in Figure 4. These pillows have the role of providing children with comfortable support, but also for height adjustment. The type 1 pillow can provide a support

of 20 cm or 10 cm, and the type 2 pillow offers an adjustment of 5 cm or 2.5 cm.

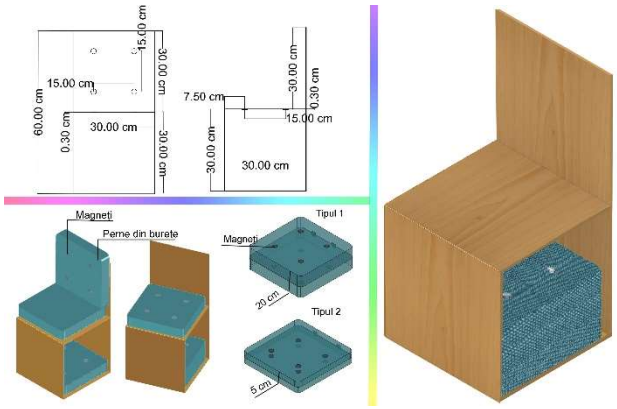


Figure 4 Chair

The pot has a support made of fir wood, and next to it there is a 15 cm shelf on which smaller children can climb to take care of the plant. In the support is installed a safe pot of 2 cm of plastic for the water in excess. The pot itself is made of plastic with holes of 0.5 cm in diameter for drainage. In it is installed a layer of 7 cm of gravel, then a layer of 30 cm of soil. The pot is designed for the work of 2 children, illustrated in Figure 5.

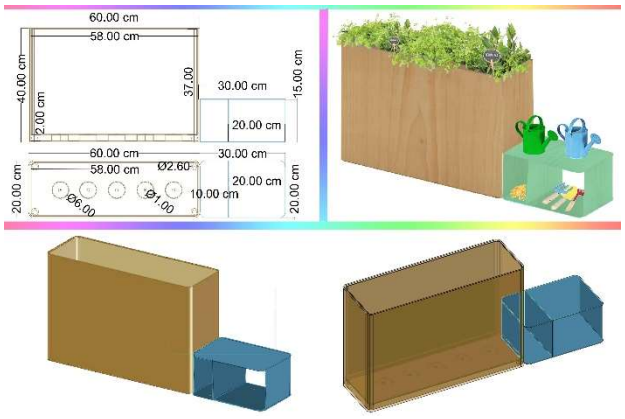


Figure 5 Pot

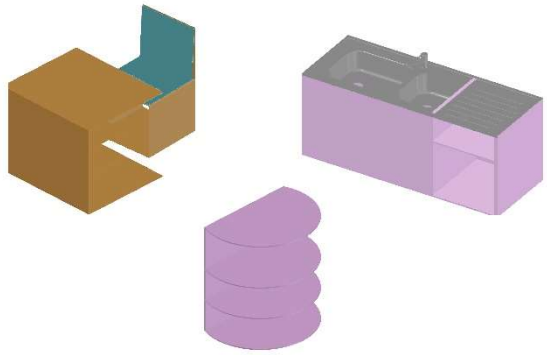


Figure 6 Teacher chair and table, bookcase, sink with drying rack

The learning area also includes bookshelves, a chair and a teacher's chair designed in the style of children's chairs and tables, as can be seen in Figure 6. The board is 150 cm wide and is up to the floor for children to use. At the western end of the area there are 2 sinks for watering the plants, washing hands and cleaning the tools with which they drew.

6.3 Transit area

The crossing area is a space where children have their own closet to leave their jacket, shoes, as well as to store the necessary things for the interior. This area includes cabinets, pots with succulents and armchairs that can be used while taking off your shoes. The area has an exit to the park in the east.

The individual wardrobe is made of wood and has a compartment with a coat hanger, a space for a backpack, a bottom shelf for shoes and another shelf for indoor shoes, illustrated in Figure 7. Each closet at the top has a 5 cm strip of blackboard so that they can write down their names.

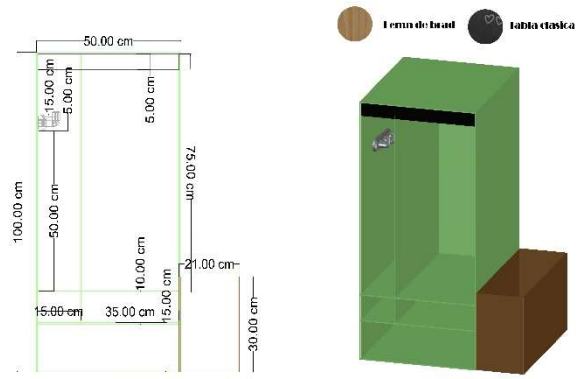


Figure 7 Wardrobe

The armchair is made of wool and is covered with textile material, cotton, without visible seams, as can be seen in Figure 8. They can be used to sit when taking off your shoes, but children can also move them very easily in any area they want.

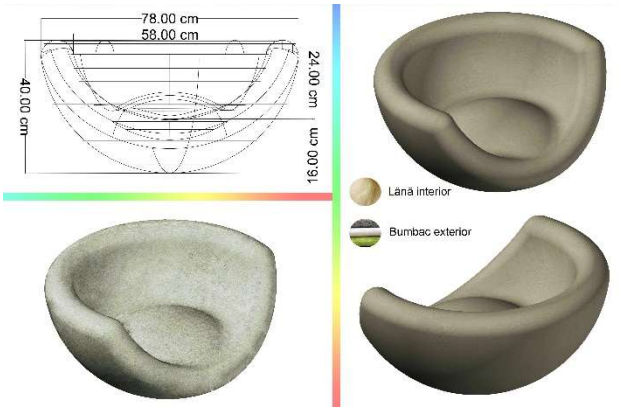


Figure 8 Armchair

6.4 Socialization area

The central area will remain free with carpeted floor, only the sides being occupied. In the east there will be a board on wheels and starting at a height of 7 cm from the floor so that children can use it. In the western part there will be a high cabinet made of fir wood, so that the last 2

shelves will remain only for the teacher, and the lower ones for the children.

On both sides will be placed 3 types of plastic cubes of different colors, shown in Figure 9.

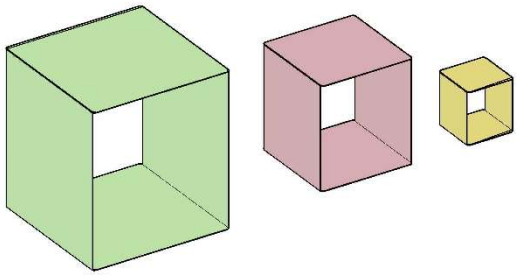


Figure 9 Cubes

These cubes will have dimensions of 60 cm, 40 cm and 20 cm, as can be seen in Figures 10, 11 and 12.

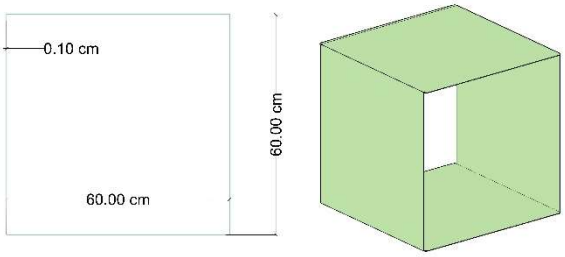


Figure 10 Cube Type 60

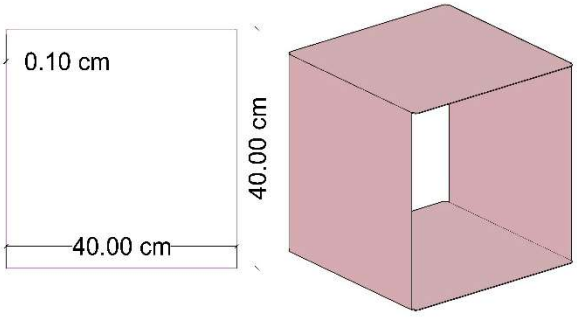


Figure 11 Cube Type 40

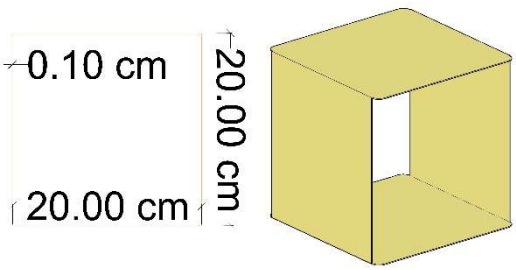


Figure 12 Cube Type 40

The cubes will be used by children for storage, to form a table, to sit on, but children will find many more uses for them, increasing their creativity. Some arrangements illustrated in Figures 13 and 14.

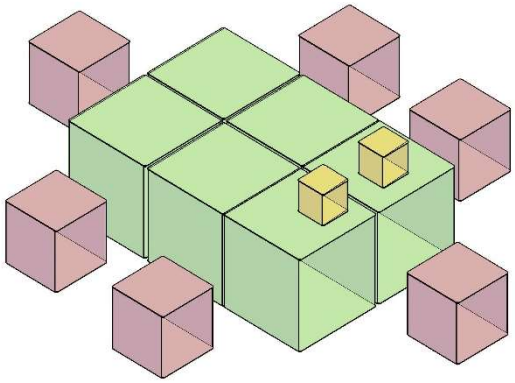


Figure 13 Possible type of arrangement

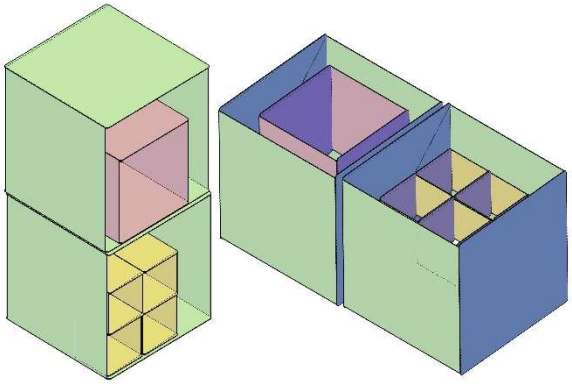


Figure 14 Possible type of arrangement

6.5 Kindergarten arrangement

The arrangement of the furniture in the room will be done according to the proposed areas. Thus, the learning area will have static furniture, mostly made of fir wood. The safety glass wall allows natural light to reach the plants in the work pots, where 2 children will work. Area illustrated in Figure 15. The stairs allow a transition between the socializing area and the learning area, where children can take their pillows from their chairs and sit on the steps.

Figure 15 Learning area

The role of the transit area is to make a transition between the outdoor space and the classroom, by leaving the jacket and changing shoes. Each child will have their own closet and armchair, as can be seen in Figure 16.

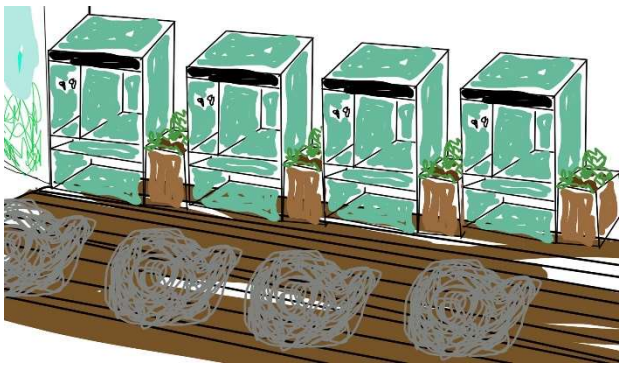


Figure 16 Transit area

The socialization area benefits from the largest space, being the most important for children. In this area they will arrange their space according to the activities they carry out with the help of cubes of different sizes. Area illustrated in Figure 17.

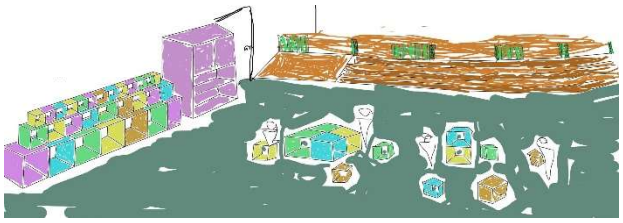
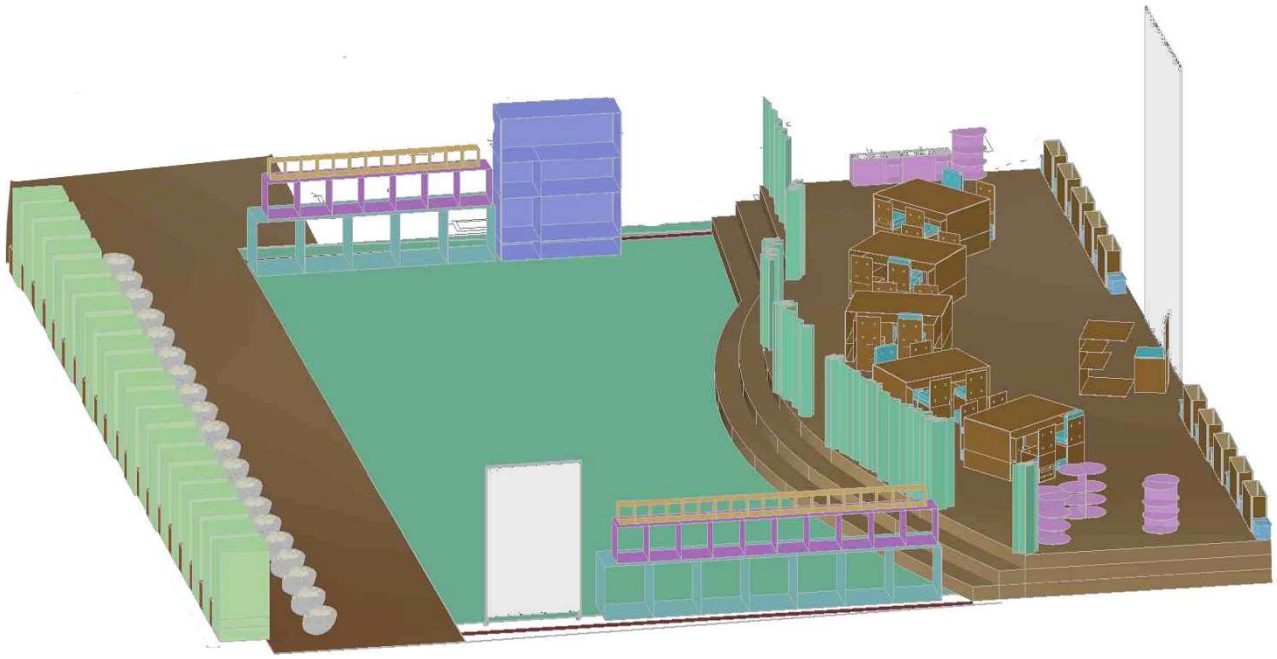


Figure 17 Socialization area



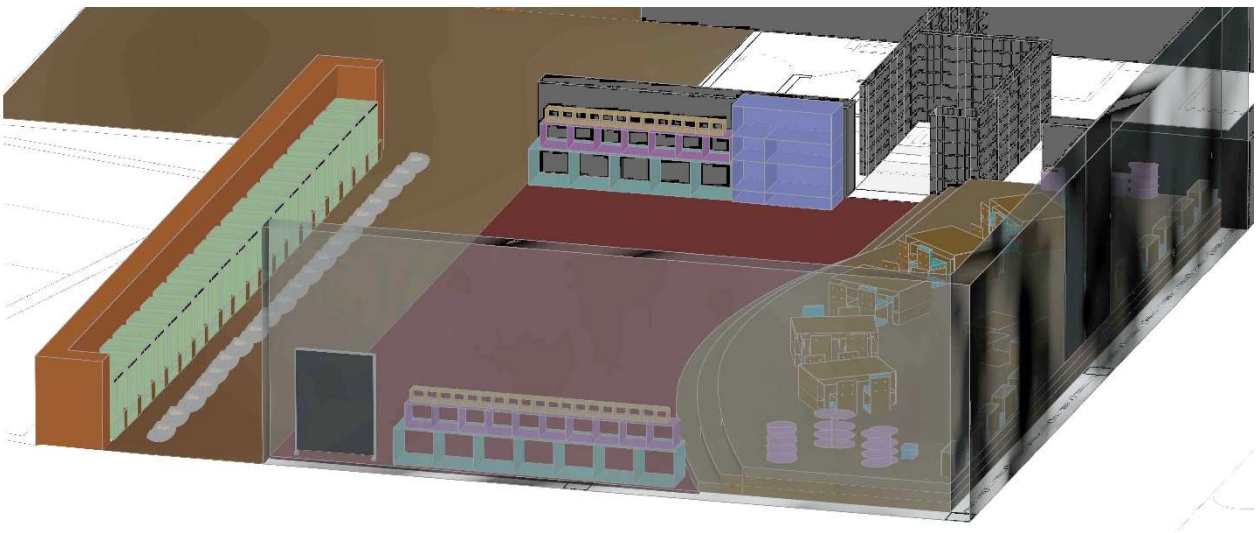


Figure 18 Kindergarten

7. SUBSEQUENT RESEARCH

Subsequent research focuses very much on the space of kindergartens. Documentation in this area from many studies shows that the furniture is massive, rigid and not adapted to the needs of children. The massive furniture leads to a cramped space.

Children need continuous movement in order to stay focused, and for this they need space. Complicated furniture with many functions makes children no longer use their creativity at normal capacity. They need simple shapes that they can interact with and place at will.

Most research talks about the social space, a free space where they can interact through group activities and how this space should remain free.

8. CONCLUSIONS

Following the documentation, a zoning of the space was carried out, and the furniture was designed according to the areas. Kindergarten illustrated in Figure 18.

The socialization area proved to be essential in any kindergarten, but also the freest in terms of furniture. Therefore, in this area it was proposed to furnish only the sides with a stable shelf, a movable sheet and cubes of different sizes. The cubes are made of plastic because they are created for children, they can arrange them in any way they want, stimulating their creativity.

The transit area is the space where children make the transition from outside to inside. In this space it was decided to place a stable closet and a mobile armchair for each child, but also pots with succulent plants, which are more resistant.

The learning area is a control area, where children have tables for 4 persons, shelves for books and a work pot for 2 people. The furniture in this area is stable, being the space that teaches and prepares them for school.

The modeling of the kindergarten furniture was made respecting the standard dimensions of children aged between 4 and 6, but also with possible modifications for those who do not meet the standard.

The style of the furniture is simple with a pastel color palette to be able to adapt to any space, as well as to allow the change of the atmosphere of the chosen space through different decorations.

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