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**THE ROLE OF DESIGN IN CREATING STIMULATING AND
SUPPORTIVE SPACES FOR EARLY CHILDHOOD
DEVELOPMENT**

The importance of interior space in educational institutions, with a focus on kindergartens, as a key factor for proper growth, development and psycho-physical well-being of children. The space, although often considered a secondary element, has a significant impact on perception, creativity, social integration and a sense of belonging among the youngest. Analyses were made of the characteristics of the space through several aspects: the spatial concept, the interior (with special attention to color, furniture, materials and lighting), as well as their impact on the daily activities and developmental processes of children. Special attention is paid to ergonomics, safety, functionality and aesthetics in the space, emphasizing the role of the designer in creating a stimulating environment. The research includes concrete

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examples and field data that support the importance of appropriately sized and organized spaces for children of different ages. The paper concludes that the integration of scientific and artistic approaches in spatial design is essential for creating an environment that will foster children's learning, development, and well-being.

Key words: space, kindergarten, design, interior

Introduction

The future is children therefore we have an obligation to provide them with conditions for proper growth and development. From a young age, they spend a large part of their time in a collective in educational institutions. Although the focus in educational institutions is mainly on educational methods, space is still an invisible factor that actively participates in the process of children's development. The time spent in that space should satisfy its basic needs, provide comfort and functionality, and at the same time awaken the creativity and imagination of children. This paper aims to systematize the characteristics of the interior space and their influence on the growth and development of children. The characteristics of the furniture directly affect the comfort of sitting, sleeping, and activities during the day, and the space itself, with its size, color, and organization, affects the creativity and independence of children.

Spatial concept

The space is one of the most important and flexible concepts in architecture. Interior space is the raw material that designers shape and use to create a functional and comfortable living environment. The structure of space includes multiple elements whose interaction defines its function.

When it comes to interior space, there is a long-term interaction between the user and the space, and the impact that the space itself causes is particularly important. This implies that multiple scientific aspects are involved in creating an adequate spatial concept for a specific purpose. The scientific disciplines of ergonomics and anthropometry help improve the function of the space, and art and technology in its aesthetics and comfort.

Space as a concept has a great influence on children's development, although it is seemingly an invisible and secondary factor. From a very young age, they spend most of their day in kindergartens where they function as a team and in an organized space. The role of space on children's development is of secondary importance, but from a young age it helps them develop their perception and creativity. The size of the rooms, their purpose, the organization of the furniture and the dimensions of the furniture itself, as well as the aesthetics of the arrangement of the entire space affect the child's psycho-physical development and their adaptation to the environment and increase the sense of belonging. The basic dimensions relating to the size of rooms and furniture intended for children are defined by applicable rules and regulations, which also shows their importance for the proper growth and development of children (Official Gazette of RM 28, 2014). However, whether that space will provide a sense of belonging and comfort also depends on factors that are not defined by law, but are part of the creativity of the interior designer, who, based on scientific research aimed at improving living and learning environments, can enrich the space and influence the development of children.

Kindergarten interior

Even in the design process of such a facility, several architectural aspects are covered - location, number of floors, orientation of the interior

space, purpose and size of rooms, materials, and functional zoning. Finally, there is the interior design, which creates the direct interaction between the space and the users. The influence of space is enormous on the intellectual development of children, because its factors themselves can influence the improvement of concentration and motivation for learning, as well as the social belonging of children in the environment. The interior space should be modeled according to its purpose and adhere to several basic principles. Rooms intended for play and activities should be larger in volume, exposed to natural light, and use lighter colors. Rest rooms can be smaller, lower, and dominated by more muted tones.

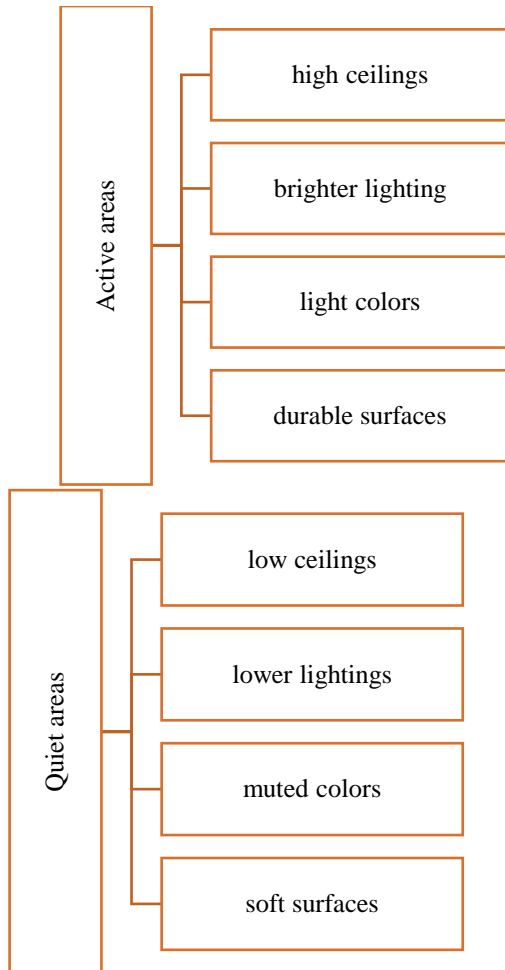


Figure 1. Design principles for active and quiet areas (CEB, 2018)

1.1. Colors in the kindergarten interior

Certain characteristics of a space are given in advance, such as its volume, interior designers can focus on other aspects. One of the most important factors is the choice of color, which is one of the most powerful tools in design. Each color evokes a certain mood and is associated with a certain environment that affects people's perception and emotions towards that space. People are now thinking more about the environment, especially with the beginning of the trend of designing interior and exterior spaces, oriented towards people.

Color is considered one of the fields of humanism that establishes a connection between art and inner human reality, which has a strong effect on human personality and behavior (Holtschue, 1994). The choice of colors in the interior of kindergartens has a psychological impact on children. It has been scientifically proven that colors affect people's mood, behavior and emotional state. Cool colors (green and blue) that are associated with water, sky, forest, evoke relaxing and peaceful feelings. While warm colors (yellow, orange, red), are associated with fire and sun and arouse excitement and attract attention. The color purple can be both cold and warm, depending on the color combination it is inserted into (if it is near blue, it is a cold color, if it is near red, it is a warm color) (Sandeva, 2019).



Figure 2. Range of colors

The intensity of colors used in the interior space should depend on the size of the surfaces and the texture. Neutral colors are used on larger surfaces, while intense and strong colors are used for accents. Each color has a specific impact on the user of the space, so the use of colors should be in accordance with its purpose. In the entertainment areas used for learning and playing, warm colors are used that can be of reduced intensity, and in the spaces intended for rest, cool colors that give a feeling of relaxation and calm.



Figure 3. Blue tones



Figure 4. Intensive warm colors

1.2. Furniture in the kindergarten interior

The function and organization of the interior space is defined by the use of furniture. In addition to the basic characteristics of the interior space, the disposition and choice of furniture and the materials from which it is made are important. Furniture in kindergartens should be flexible, have the

ability to adapt to different age groups and meet the needs of the children's intended activities. The basic characteristics that kindergarten furniture should have are:

- Ergonomically adjusted to the child's body measurements according to age;
- Made from easily maintainable and durable materials;
- Safe for independent use (no sharp edges);
- Flexible;
- Calming colors. (CEB, 2018)

The design and dimensions of the furniture have an impact on the psycho-physical development of children and their habit of sitting correctly. (Yeats B., 1997) According to the *Rulebook on Standards and Norms for Performing the Activities of Children's Institutions (Article 37)*, chairs with dimensions of 31/22/29 cm are provided for a group of children aged two to four years, and chairs with dimensions of 36/24/34 cm are provided for children aged four to six years and six to ten years.

With measurements taken of 40 children in the kindergarten „Vera Ciriviri Trena” in Shtip, it was determined that the average height of the lower leg of children aged 2–3 is 25.1 cm, and of children aged 4–5 is 30.5 cm. This data is an indicator that the seating furniture (chairs) in kindergartens should have different dimensions for children of different age groups, which is not the case everywhere. The correct choice of chairs ensures correct sitting and posture of children from a young age. Chairs should allow sitting with legs bent at a right angle and feet fully resting on the floor.

In addition to the characteristics that the furniture itself should possess, the arrangement of the furniture in the space is also very important, in order to enable free access and unhindered movement. In such spaces, the

use of flexible and multifunctional furniture is desirable, in order to quickly transform and save space. This refers to the use of furniture that has built-in wheels, multifunctional organizers, sliding partitions, the use of materials that will be used both as an educational tool and as useful furniture (Sandeva, and Despot, 2022).



Figure 5. Multifunctional and flexible furniture (CEB, 2018)

1.3. Materials in the kindergarten interior

The materials used in this type of facility should ensure easy maintenance and comfort for children. For floors, it is most important that they are made of materials that are hard, wear-resistant, non-slip and easy to maintain. In play areas, the materials should be natural, warm and nuanced in light tones (Official Gazette of RM 28, 2014).

Floors should be hard, non-slip, wear-resistant, easy to maintain, natural, warm and nuanced with light tones. Finishing materials in rooms where water is used should be non-slip and have a slope towards the floor drains, opposite the approach to them, and in the case of open terraces, the slope should be from the interior walls to the exterior.

In toilets and rooms where sanitary facilities are provided, walls with a height of 210 cm should be covered with ceramic tiles or another type of building material that is waterproof, easy to maintain with liquid

disinfectants. For the safety of children, internal walls or partitions should not be glazed at a height of 1.00 m. For the sake of visual connection with other rooms, it is recommended to use fixed transparent openings in the partition walls, with unbreakable glass to ensure control and protection.

In children's rooms, all corners should be protected with corner moldings at least 1.00 m high. Mirrors should be protected with foil on the back to protect children in case of breakage. In rooms where sports activities will take place, the walls and corners should be treated with building materials that absorb the sound of impacts and are resistant to mechanical damage, at a height of 1.60 m from the floor.

The window parapets on the ground floor in the entertainment rooms should be at a minimum height of 60 cm, and in the entertainment rooms on the first floor at a minimum height of 90 cm. The window sashes that will open should be at a minimum height of 1.25 m. At least 30% of the windows should allow opening along a horizontal and vertical axis. The surfaces of the ceiling should be with minimal reflection, smooth and bright. The hardware can be made of wood or another type of material with thermally insulated profiles and thermally insulated glass.

External entrance doors should be protected from external influences with eaves, canopies, porches, etc. They should be self-closing. Doors in children's rooms on the hinge side should be protected from finger injuries and open towards the exit of the building. All doors should be threshold-free with at least 90 cm for single-leaf doors and 130 cm for double-leaf doors. Doors in utility rooms such as kitchens, laundry rooms and boiler rooms should be at least 120 cm wide to allow for the entry of equipment.

Electrical outlets should have protection and be placed at a height of 180 cm. Switches should be 1.20 to 1.30 m high so that they can be reached by children.

The walls in kindergartens should be finished with materials that provide a feeling of warmth and are also resistant to mechanical damage. Internal partitions should not be glazed at a height of 1.00 m from the floor. In such spaces, the placement of mirrors and equipment and furniture with sharp corners should be avoided.

Equipment and furniture in kindergartens should be made of natural materials, easy to maintain, aesthetically and functionally adapted to the age of the children.

1.4. Lighting in kindergartens

Good design, with well-planned lighting, significantly improves the comfort of interior spaces, adding great aesthetic, functional value. The choice of a lighting system can contribute to improved efficiency and sustainability in the building as a whole. Special attention should be paid to the quantity, quality and type of lighting for each different environment. Designating the exact location where each light bulb will be installed is just as important as knowing the quantity and color of the light bulb. In sleeping areas, the ideal position is always to maintain direct central lighting with warm colored light. Depending on the size of the room, the number of lamps should be calculated. Unlike adults who require maximum darkness to achieve a good rest, children have different requirements. For example, soft light always and everywhere to reduce the fear of the dark, bright light in the bathrooms or during hygiene maintenance, spotlights on the walls of stairs, hallways. Sleeping areas should be cozy, with lighting that is warm in color and temperature. Cool tones are recommended in study rooms that require attention and concentration. Play areas should have good ventilation and natural light, as children spend most of their time there. The more natural light, the better. It should not be blocked by furniture or opaque materials. It is recommended that windows be as visible as possible (meaning not to put

too many curtains, blinds, etc.), as it helps children see the outside world. Glass balls, for example, can create a beautiful space when sunlight passes over them. Lighting should be safe, low-voltage and energy-efficient.

The role of design in children's development

Interior designers, with their education, training, and experience, are qualified to design interior spaces, thereby improving the quality of life, increasing productivity, and protecting human health, safety, and well-being (Foundation for Interior Design Education Research, 1998). Any research helps to understand existing problems, which opens up the opportunity to influence the improvement of the quality of life. The correct choice of colors, materials and equipment in kindergartens contributes to the correct psycho-physical development of children, affects their sense of belonging in the environment, improves concentration and motivates them to learn and learn. The space in which the child grows and develops represents a kind of „third educator”, in addition to the parent and the educator. A creatively designed interior not only encourages cognitive and motor skills, but also influences the emotional stability of children. Through carefully selected visual and tactile elements, the design provides an environment that inspires independence, curiosity and interaction. The flexibility of the space also plays a major role – the ability to easily adapt it to the needs of the children and the activities that are performed, providing a dynamic and stimulating atmosphere. In addition, the appropriate organization and aesthetics of the space influence the development of habits of order, hygiene and self-discipline. Design, in this sense, is not only a visual art but also a functional tool that actively participates in the educational process.

Conclusion

The use of transforming furniture and equipment affects children's sense of belonging in the space itself, as they themselves in some way influence the transformation.

Measurements taken in one kindergarten on a portion of the children cannot provide a complete picture of the real situation at the level of the entire country, but are an indicator that legal norms should be revised and, if necessary, supplemented, in order to provide better conditions for learning and residence in educational institutions. This applies to the dimensions of the chairs, the result of which shows that the intended height of the seat is greater than the measurements taken.

The correct organization of furniture and equipment in the space can influence the increase of children's independence and self-reliance and help in the process of acquiring good habits. The choice of materials can positively influence children's health, as well as reduce the possibility of allergic reactions.

The space in which children spend their early childhood has a deeper impact than it seems at first glance. Its organization, colors, furniture, materials and lighting are not just physical elements, but tools for fostering creativity, safety and overall psycho-physical development. By investing in the design of kindergartens, we can create environments that encourage learning, social interaction and a sense of belonging from an early age.

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УЛОГА ДИЗАЈНА У СТВАРАЊУ СТИМУЛАТИВНИХ И ПОДРЖАВАЈУЋИХ ПРОСТОРА ЗА РАНИ РАЗВОЈ ДЕТЕТА

Рад разматра значај унутрашњег простора у образовним установама, са посебним фокусом на предшколске установе, као кључног фактора правилног раста, развоја и психофизичког благостања деце. Простор, иако се често посматра као секундарни елемент, има значајан утицај на перцепцију, креативност, социјалну интеграцију и осећај припадности код најмлађих. Анализиране су карактеристике простора кроз више аспеката: просторни концепт, ентеријер (уз посебно разматрање боја, намештаја, материјала и осветљења), као и њихов утицај на свакодневне активности и развојне процесе деце. Посебна пажња посвећена је ергономији, безбедности, функционалности и естетици простора, уз истицање улоге дизајнера у стварању подстицајног окружења. Истраживање обухвата конкретне примере и податке са терена који потврђују значај адекватно димензионисаних и организованих простора за децу различитих узраста. У закључку се истиче да је интеграција научних и уметничких приступа у просторном дизајну од суштинског значаја за стварање окружења које подстиче учење, развој и благостање деце.

Кључне речи: простор, вртић, дизајн, ентеријер.