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A Global Perspective on Indoor Playing Areas and Space Organization in Kindergartens

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Abstract

Play, which occupies most of young children's lives, is necessary for their healthy growth. Playing areas, by helping children develop physically, psychologically, and sociologically, foster their creativity, problem-solving skills, and social development. Thus, the design of kindergartens including playing areas is important. This article explores the design aspects of kindergarten interior playing areas. It aims to contribute to the design of the global development of inclusive kindergarten and educational environments. Using a qualitative method to analyze specific cases, the study comprehensively reviews kindergarten playing areas, specifically their interior properties. The findings regarding the strategic location of playing areas, architectural characteristics, playground layouts, access points, relationships with other connected spaces, and features are summarized in tables and discussed. It is found that there are considerable differences in the design of kindergartens and the design of interior playing areas is getting more significant.

Keywords: *Education and interior design, interior playing area, spatial organization, kindergarten design.*

Anaokullarındaki Kapalı Oyun Alanları ve İç Mekân Organizasyonlarına Küresel Bir Bakış

Öz

Oyun oynamak, çocukların neredeyse tüm yaşamıdır ve sağlıklı büyümeleri için gereklidir. Oyun oynama eylemi onları fiziksel, psikolojik ve sosyolojik açıdan geliştirdiği için oyun alanları da yaratıcılıklarını, problem çözme becerilerini ve sosyal gelişimlerini artıracak mekânlardır. Bu nedenle oyun alanlarına sahip anaokullarının tasarımı önemlidir. Bu çalışma, anaokullarının içindeki oyun alanlarının tasarımı üzerinedir. Kapsayıcı yaklaşımlı anaokulu ve eğitim ortamlarının tasarımının gelişimine katkıda bulunmayı amaçlamaktadır. Nitel yöntemli araştırma, anaokullarını incelerken kapsamlı bir bakışla oyun alanlarının mekânsal organizasyonuna odaklanmaktadır. Belirlenen vaka çalışmalarının tablolarda özetlenen analizleri aracılığıyla iç mekânsal özellikleri araştırılmaktadır. Oyun alanlarının stratejik lokasyonları, mimari özellikleri, oyun alanlarının yerleşimleri, erişim noktaları, diğer bağlantılı mekânlarla ilişkileri ve donatıları tartışılmaktadır. Çalışmada, anaokullarındaki oyun alanlarının ciddi farklılık gösterdiği ve iç tasarımlarının giderek önem kazandığı belirlenmiştir.

Anahtar kelimeler: *Eğitim ve iç mekân tasarımı, oyun alanı, mekânsal organizasyon, anaokulu tasarımı.*

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1. Introduction

Play is not only an action of children providing pleasure but also a tool for learning and teaching (UNICEF, 2018). It is gaining importance both outdoors and indoors. The evolving understanding of the significance of play in early childhood education is evident from the changing design of kindergarten playing areas. Whereas these were conventional basic spaces with standard equipment, recent years have shifted towards more thoughtful planning for diverse and enriching play experiences (Kavaz, 2020).

As, Yürekli & Yürekli (1999) indicates in their article about educational building design that building is an educator for children. In addition, recognizing play as fundamental to children's development, contemporary kindergarten design aims to create environments fostering exploration, creativity, problem-solving, and social interactions that provide engaging and enriching experiences for children (Ciravoğlu, 2004; Dudek, 2012; Milteer & Ginsburg, 2012).

This article analyzes play areas in kindergarten interior spaces to discuss the importance of play in children's education. Since ergonomics, access, health, and safety measures are important considerations in architecture and interior design (Hakim & Von Meiss, 1994, Dodsworth & Anderson, 2019) the analysis in the study identifies and includes them as crucial features and main criteria in related case studies.

1.1. Aim and Importance of the Study

The present study is important for advancing the understanding of the evolving role of play in early childhood education, exploring global perspectives on kindergarten design, and providing a comprehensive analysis of factors influencing the design of kindergarten playing areas. As mentioned in the article of Broekhuizen, Scholten & Vries (2014) design of children's environments requires multi-disciplinary approaches. So the findings of this study can inform educational policymakers, architects, and designers in creating environments that more effectively support children's development and learning.

As highlighted by Shackell et al. (2008), there has been significant globalization of standards and regulations regarding the design of kindergarten indoor play spaces. On the other hand, some regulations and practices vary across countries (Mariyana & Setiasih, 2017). Hence, the primary focus of the present study is to explore how this global approach to designing indoor play spaces in kindergartens. Moreover, it investigates the internal connections within various kindergartens worldwide, with a specific emphasis on strategically positioning indoor playgrounds and understanding the spatial relationships between these areas and other interior spaces.

The study has several further aims. First, it aims to identify the fundamental criteria governing the interior design of playing areas, while analyzing kindergarten playing areas in terms of their sectional and plan characteristics. Second, it seeks to uncover important aspects of designing kindergarten interior playing areas, emphasizing the significance of designing educational buildings, particularly kindergartens. Third, it aims to examine the spatial relationships between indoor playing areas and other interior spaces within kindergartens as Abbi (2018) similarly analyzed.

The study is important for exploring global perspectives on kindergarten design and providing a comprehensive analysis of factors influencing the design of playing areas in kindergartens. The findings have the potential to inform educational policymakers, architects, and designers in creating environments that effectively support children's development and learning.

2. Materials and Method

Given that kindergartens are crucial educational hubs for children, the design and construction projects are highly significant regarding their impact on children's growth and development (Pardee et al., 2005; Can & Şeker, 2022). Consequently, numerous studies have been undertaken to assess and improve kindergartens globally, with a specific focus on design enhancements. These establish the literature review of this study which employs a qualitative methodology, including case analysis. The study examines ten cases after a deep review to explore relevant keywords.

These cases are selected from developed countries that prioritize children's education (Table1). The data relating to cases (except Case 4) are collected from official websites and digital architectural sources concentrating on kindergarten projects. The data of Case 4 is based on observation and architectural documents collected during the fieldwork. They are chosen from nine countries, including Norway (No. 1), Canada (No. 2), Sweden (No. 3), North Cyprus (No.4), Japan (No. 5), Australia (No. 6), the United States (No. 7), Singapore (No. 8), Germany (No. 9), and China (No.10). The selection was based on specific criteria to ensure the relevance and richness of the collected data. The criteria include a deliberate focus on kindergartens that emphasize interior play spaces, contemporary construction (built within the last 15 years) to reflect current design trends, integration into densely populated urban areas, strategic placement in well-known neighborhoods, proximity to city centers for accessibility and visibility, and original conceptualization and design as kindergartens serving young children. Only one of the cases is presented in the article (Figure 1 and Figure 2) while all ten cases are included in the discussion section (Figure 3a, 3b).

Table 1. General information about the cases

NO	Name of Kindergarten	Location	Construction Year	Designer	Area (m^2)
1	Tromso Kindergartens	Tromso, Norway	2006-2008	70 N Arkitekture	622 m^2
2	SFU Kindergarten	British Colombia, Canada	2012	HCMA Architecture	530 m^2
3	Sjötorget Kindergarten	Stockholm, Sweden	2013	Rostein Arkitekture	720 m^2
4	Levent Kindergarten	Nicosia, Cyprus	2013	Levent Construction	1017 m^2
5	OB Kindergarten & Nursery	Nagasaki, Japan	2015	HIBINOSEKKEI Youji no Shiro	10000 m^2
6	NUBO Kindergarten	Sydney, Australia	2017	PAL Design	768 m^2
7	Big and Tiny	Santa Monica, United States	2018	Zooco Estudio	195 m^2
8	Sparkletots Preschool	Singapore, Singapour	2018	LAUD Architects	8400 m^2
9	Riedlepark Kindergarten	Friedrichshafen , Germany	2018	Lanz Schwager Architekten	2277 m^2
10	Shenzhen King's Kindergarten	Shenzhen, China	2020	Groundwork Architects	5000 m^2

To understand the interior design approach of the cases each case is documented in two graphics:

The first one (Figure 1) presents the case's architectural and interior design characteristics with technical drawings and images. These data were collected from relevant sources, such as architectural journals and websites, to provide a catalog of the case. For the selected one, shown in Figure 2, all documents and graphics were organized by the author. The plan of each case, scaled at either 1/500 or 1/1000, shows the kindergarten's overall layout with the playground area highlighted in color. If the kindergarten has multiple floors, only the relevant floor is included. The section of the entire kindergarten or a magnified section focusing on the playing area, is marked in another color. The used

images are divided into three parts. The first two incorporate existing or captured photographs of the kindergarten for the analysis while the third part presents the various activities and play elements in the play area.

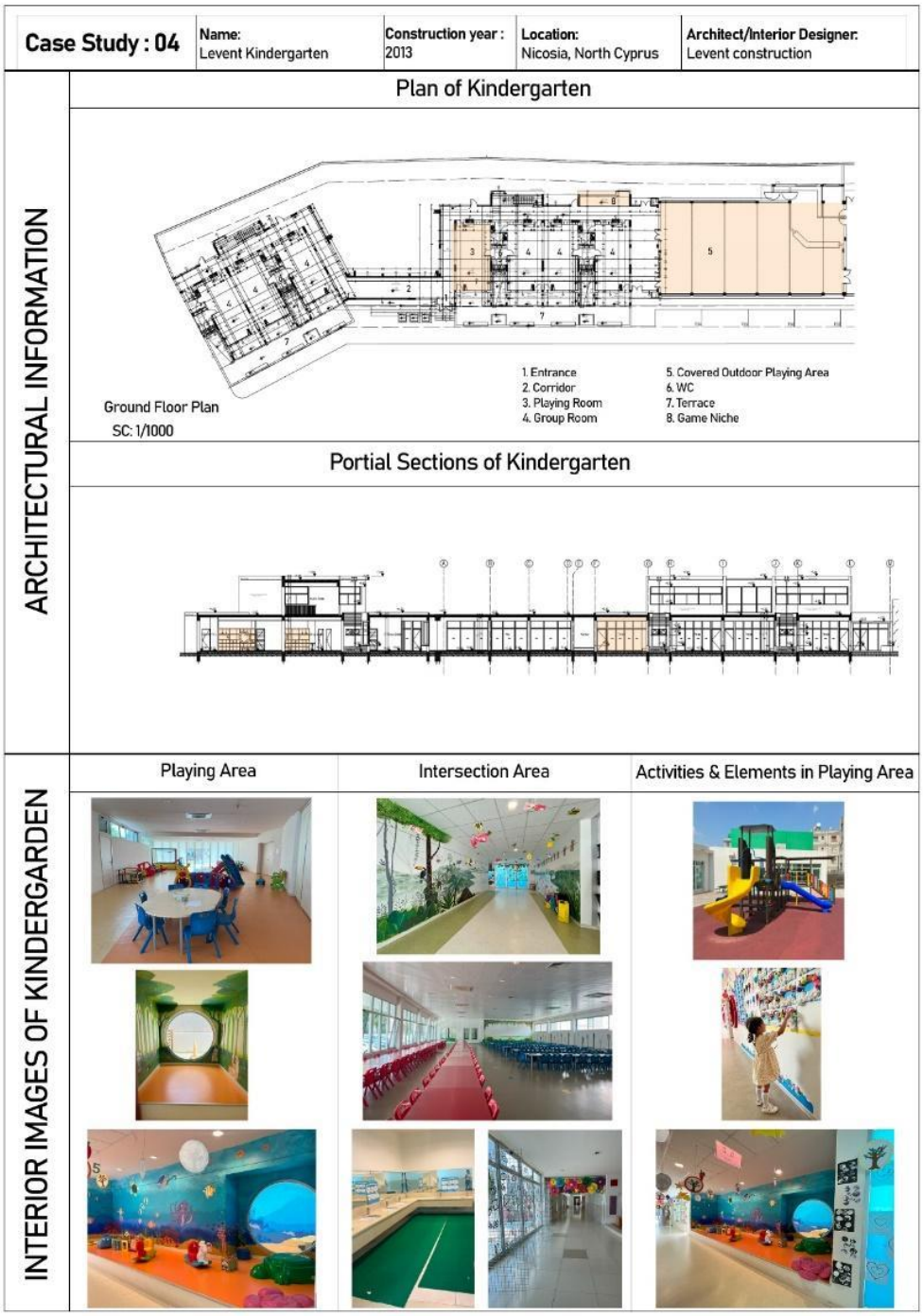


Figure 1. Case 4, Levent Kindergarten 1 (Author, 2023)

The second one (Figure 2) has three main sections to evaluate the case in terms of its plan, section, and features. The first part, explaining "plan and zoning", presents architectural information, and subsections: plan and kindergarten zoning that refers to the approach of (Ching, 2007). The second part analyses the section and vertical relation between spaces. The third part includes five subcategories regarding the kindergarten's playground features. It examines playground equipment, distinguishing between movable items (e.g., hula hoops, water play, toys, and bicycles) and/or fixed elements (e.g., slides, swings, climbing structures, wooden pools, and balance equipment). It shows whether the play area incorporates architectural elements like walls, windows, and stairs. It also

examines the spatial relationships with other activities such as green areas, libraries, dining halls, classrooms, restrooms, corridors, and group classes.

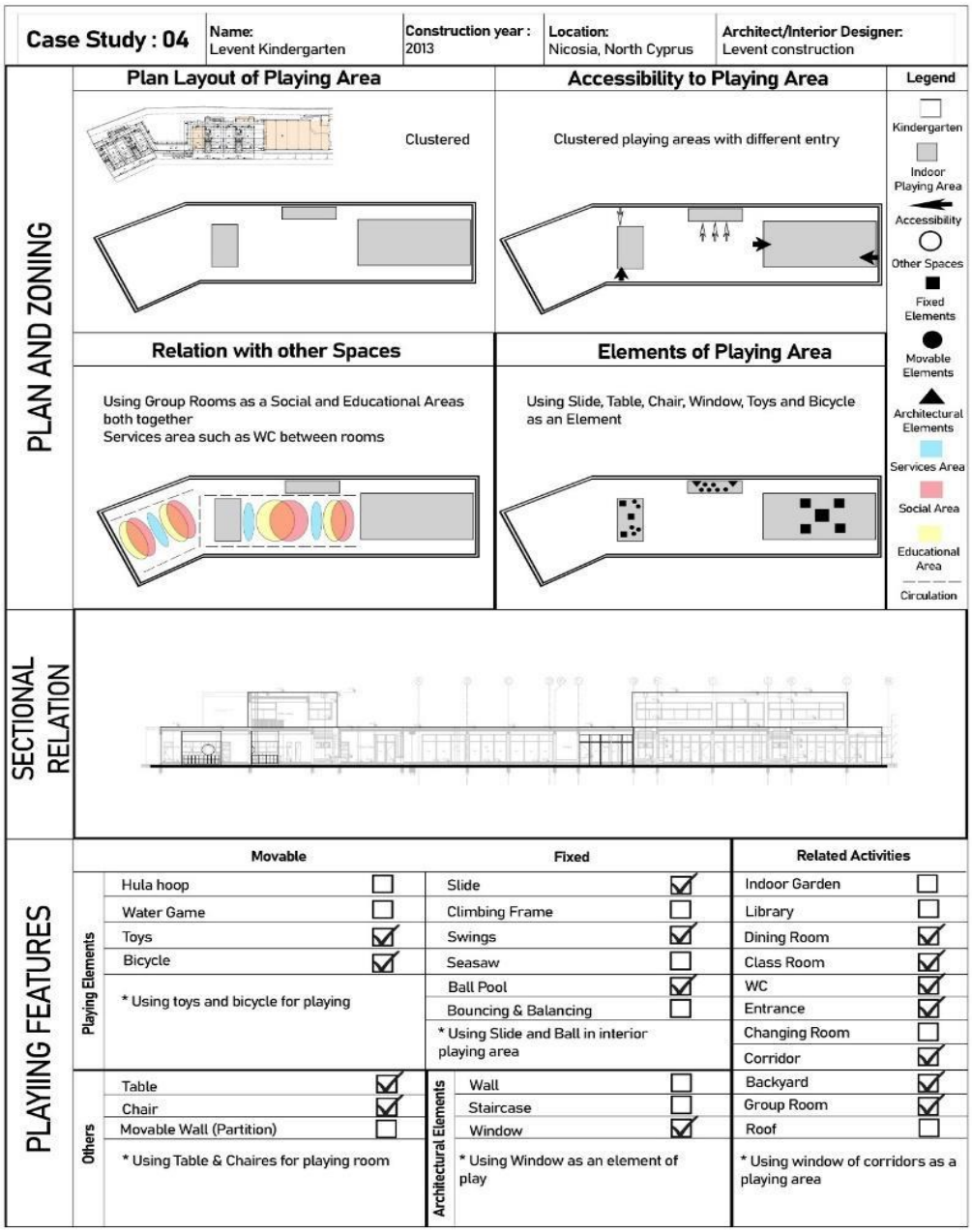


Figure 2. Case 4, Levent Kindergarten 2 (Author, 2023)

3. Findings and Discussion

Despite their differences, the ten selected kindergarten examples exhibit several common properties in terms of spatial organization (Figure 3a, 3b), particularly in plan layout, accessibility, and relation with other interior spaces, play features, interior design property, and outdoor relations. There are different plan types in between cases. Three models were analyzed as having a centralized (Cases 3, 8, and 9) while three others had a clustered form (Cases 1, 4, and 5). One model was both concentrations (Case 6) and sampling methods within the linear (Case 7), gridal (Case 2), and radial (Case 10) categories, following Ching's (2007) classification and organization.

For plans and access within the centralized plans category, the analysis showed that the case's classification remains unchanged, regardless of whether the plan is centralized with one entry or has numerous primary and secondary entrances. The clustered models have more access points than other models, typically two, but occasionally up to ten (Case 10). Due to its form, the radial model shares

multiple access points with clustered cases. Previous studies of kindergarten design have reported that service spaces supporting the kindergartens are also important (Shackell et al., 2008). Regarding spatial relationships, in centralized plans, changes in proximity to educational, social, and service spaces show consistent equality. However, in clustered plans, the most significant spatial relationships link playing areas with service zones and social spaces, with fewer connections to educational areas (e.g., Case 5). In radial plans, similar to centralized ones, there is close interaction between almost all spaces. In gridal and linear plans, the playing area can interact with two other spaces, such as service and social spaces. The analysis revealed that the most critical spaces, situated close to the playing area, are service spaces because active children require them the most. Social spaces like dining halls and group areas are also considered significant.

Regarding play elements, there has been a change from traditional components like swings and slides to architectural elements like stairs and walls. These elements are often arranged collectively rather than individually.

Analysis of the images indicated the spaces mostly use neutral and naturally colored materials, such as wood and concrete. However, architectural or play elements are highlighted with bold colors like yellow, blue, green, and orange (e.g., Case 3). In some cases (2, 6, 7, 9, and 10) play elements are made of natural stone, wood, and concrete, occasionally accented with other colors to create contrasts. Aside from plan and three-dimensional considerations, the analysis showed that ceiling design plays a crucial role. The ceilings in these spaces are not merely low; their positioning is also determined by spatial relationships between the playing area and other spaces. This design concept mirrors the concept in the lobby and exhibition space ceilings. That is, it often includes balconies or large windows in the playing area section. Some cases (e.g., Case 5 and 9) incorporate light-enhancing features like grooves and openings to introduce natural light which is crucial for children's spaces as mentioned in the literature (Souza, 2022) and create a connection to the sky.

In other cases (e.g., Case 2, 3, 4, 6, and 8), large windows connect the indoor and outdoor spaces. For example, Case 8 employs a high ceiling with large windows, designed to foster interaction and transition between the exterior and interior, utilizing the surrounding greenery for year-round engagement. Another notable feature of these cases is the absence of ceiling coverings, which allow children to engage with the ceiling materials and components directly. The architects and designers also try to establish connections with green spaces through various plant coverings, as evidenced in the centralized plan of Case 8 or the introduction of large potted plants in Case 7, which lacks natural green coverage (Table 2).

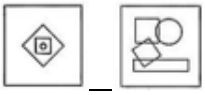
CASE NO.	PLAN LAYOUT TYPE		ACCESSIBILITY TO PLAYING AREA	RELATION WITH INT. SPACES	
CASE 1 NORWAY		CLUSTERED	VARIETY OF AXIS		SOCI. SERV. EDU.
CASE 2 CANADA		GRID	3 AXIS		SOCI. SERV.
CASE 3 SWEDEN		CENTRALIZED	1 MAIN AXIS		SOCI. SERV.
CASE 4 CYPRUS		CLUSTERED	VARIETY OF AXIS		SOCI. SERV. EDU.
CASE 5 JAPAN		CLUSTERED	VARIETY OF AXIS		SOCI. SERV.
CASE 6 AUSTRALI		CLUSTERED/ CENTRALIZED	2 AXIS		SOCI. SERV. EDU.
CASE 7 U.S.A		LINEAR	2 AXIS		SOCI. SERV. EDU.
CASE 8 SINGAPOUR		CENTRALIZED	4 AXIS		SOCI. SERV. EDU.
CASE 9 GERMANY		CENTRALIZED	2 AXIS		SOCI. SERV. EDU.
CASE 10 CHINA		RADIAL	VARIETY OF AXIS		SOCI. SERV. EDU.

Figure 3a. Summary Analysis of Cases (Author, 2023)

CASE NO.	PLAY FEATURES		INTERIOR DESIGN PROPERTY		OUTDOOR RELATION	
CASE 1 NORWAY		WALL		OPENING IN ROOF		VISUAL RELATION
CASE 2 CANADA		MOVABLE BICYCLE		HIGH HEIGHT FOR PLAYING SPACE		ACCESS TO BACKYARD
CASE 3 SWEDEN		STAIRCASES		DIFFERENT LEVELS FOR PLAYING SPACE		VISUAL RELATION
CASE 4 CYPRUS		CORRIDORS WITH BIG WINDOWS		NORMAL HEIGHT		VISUAL RELATION
CASE 5 JAPAN		STAIRCASES ROOF ACTIV.		OPENING IN ROOF		VISUAL RELATION
CASE 6 AUSTRALI		BIG SLIDE		ORIGINAL CLLING MATERIAL		VISUAL RELATION
CASE 7 U.S.A		SLIDE		ORIGINAL MATERIALS AND SHAPES CLLING		INDOOR PLANTS
CASE 8 SINGAPOUR		STAIRCASES		MOVABLE CELL		INDOOR GARDEN
CASE 9 GERMANY		ARCHITECTURE ELEMENTS		OPENING IN ROOF		GROOV IN ROOF
CASE 10 CHINA		STAIRCASES		HIGH HEIGHT CELLING		VISUAL RELATION

Figure 3b. Summary Analysis of Cases (Author, 2023)

Table 2. Results of cases (Author, 2023)

ANALYZE NO. FIND NO.	RESULTS	NOTES
ANALYZE 1 **FIND 1**		Most of the layout plans in 10 cases are centralized and clustered.
ANALYZE 2 **FIND 2**	Variety of axis	Most of the access to play areas is connected by various axes.
ANALYZE 3 **FIND 3**	Social, Services, Educational	The most important relation between interior playing areas is with Social, Services, and Educational Spaces.
ANALYZE 4 **FIND 4**	Staircases	Most of the play features are designed in staircases.
ANALYZE 5 **FIND 5**	Opening in Roof	The opening in the roof is the most important interior design feature for indoor play areas.
ANALYZE 6 **FIND 6**	Visual Relation	Visual Relation is the most common relation between indoors and outdoors in kindergartens.

4. Conclusion and Suggestions

Based on the analysis of the ten diverse kindergarten cases, several common traits can be identified in their spatial organization. In particular, the kindergarten layouts can be mostly classified into centralized and clustered plans, each exhibiting unique characteristics. Centralized plans are quite consistent whereas clustered plans vary significantly with more access points. The spatial relationships within these plans reveal proximity patterns to key educational, social, and service spaces, emphasizing the importance of service spaces in catering for active children.

The analysis explored the evolving landscape of play elements in kindergartens, noting a change towards architectural elements like stairs and walls. Ceiling design was highlighted for its role in orchestrating spatial relationships, with some designs opting for exposed ceilings and features like balconies or large windows. The absence of ceiling coverings fosters direct interaction with materials, while efforts to connect with green spaces are evident through plant coverage.

The use of neutral and natural hues of raw materials dominates the visual palette, while vibrant colors are introduced in architectural and play elements. These findings emphasize the significant role of kindergartens in a child's initial educational environment, prioritizing safety, well-being, and developmental needs.

The study responded to four key design issues, the evolution of contemporary preschools, the impact of design on play and recreational activities, the strategic arrangement of interior play areas. The insights from the analysis include a focus on architectural elements within play areas, the integration of natural hues, and the crucial link between children's growth and their spaces. The analysis underscores the importance of designing environments, including interior play areas, that facilitate exploration, learning, and joy for a promising future.

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Author Contribution and Conflict of Interest Declaration Information

All authors contributed equally to the article.

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