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Araştırma Makalesi

**THE RELATIONSHIP BETWEEN SPACE AND EDUCATION: THE ROLE OF
PHYSICAL ENVIRONMENTS IN SUPPORTING CREATIVITY IN PRESCHOOL
EDUCATION**

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Abstract

Preschool educational environments that support creative potential contribute to children's social, emotional, cognitive, and physical development. This study analyzes the common characteristics of preschool spaces that foster creativity and aims to develop a new spatial organization model. A qualitative research approach was adopted using a descriptive case study with a holistic single-case design. The study was conducted in a preschool in Kadıköy, Istanbul, with a purposive sample of 10 children and 3 teachers. Data were collected through the "Creative Learning Environment Assessment Scale" and open-ended interview forms. Findings indicate that spacious and flexible environments enhance children's creative development. Based on these results, a new spatial design model was developed to foster creativity in children, emphasizing the need to improve existing standards.

Keywords: Early childhood education, interior design, learning environments, creativity.

**MEKÂN VE EĞİTİM İLİŞKİSİ: OKUL ÖNCESİ EĞİTİMDE
YARATICILIĞI DESTEKLEYEN FİZİKSEL ORTAMLARIN ROLÜ**

Öz

Yaratıcı potansiyelleri destekleyen okul öncesi eğitim ortamları, çocukların sosyal, duygusal, bilişsel ve fiziksel gelişimlerine katkı sağlar. Bu çalışmada, okul öncesi eğitim mekânlarının yaratıcı potansiyeli destekleme açısından ortak özellikleri analiz edilerek yeni bir mekânsal organizasyon modeli oluşturulmuştur. Betimsel araştırma kapsamında nitel yöntemlerden

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Bu makale 'Okul Öncesi Eğitimde Yaratıcılığı Geliştirmeye Yönelik Mekân Tasarımı Önerisi' doktora tezinden üretilmiştir.

'durum çalışması' benimsenmiş, bütüncül tekli durum deseni seçilmiştir. Araştırma, İstanbul Kadıköy'de bir anaokulunda yürütülmüş, amaçlı örnekleme yöntemiyle 10 çocuk ve 3 öğretmenle çalışılmıştır. Veri toplama sürecinde "Yaratıcı Öğrenme Ortamlarının Değerlendirilmesi Ölçeği" ve açık uçlu görüşme formları kullanılmıştır. Sonuçlar, geniş ve esnek mekânların yaratıcı gelişimi desteklediğini göstermiştir. Elde edilen bulgular doğrultusunda, çocukların yaratıcılığını artıracak bir mekân tasarım modeli geliştirilmiş ve standartların iyileştirilmesi gerekliliği vurgulanmıştır.

Anahtar Sözcükler: Erken çocukluk eğitimi, iç mekân tasarımı, öğrenme ortamları, yaratıcılık.

Introduction

Childhood is the first stage of the development of individuals' abilities. This period includes the progress made in the social, emotional and cognitive development of children during the pre-school education process, the acquisition of language and psychomotor skills and the shaping of their personalities (Yaşar & Aral, 2010). At the same time, the foundations of imagination and creativity are laid in childhood. Freud suggests that the sources of creativity should be sought in childhood experiences (Shojaei & Shariatmadari, 2016). For these reasons, the developmental needs and creativity of children should be taken into consideration in the design of indoor and outdoor spaces in preschool period.

The aim of this study is to investigate the effects of eliminating deficiencies in early childhood education environments and designing spaces that support creative thinking on children's development. In this context, the effects of spatial arrangements, colour schemes and environmental flexibility on children's cognitive and affective development are examined. Research shows that children's spatial perception, their emotional experiences in space, and their social, cognitive and emotional positioning necessitate that space design should be planned to support these developmental and creative features (McCoy & Evans, 2002). Based on this assumption, 'physical environmental factors in preschool education can increase students' creativity' is the hypothesis of this study.

By reflecting the values and goals of the organisation, space design can direct and change the perception within the space and create feelings of freedom or confinement for the user. A suitable environment has been found to have positive effects on children's affective and cognitive learning (Açıkgöz, 2003). Considering that genetic factors are 30% effective in brain development and environmental factors are 70% effective in brain development, it is seen that teaching environments play an important role in brain development (McNaughton et al., 2006).

Creativity is an ability that emerges in the problem solving process and develops from birth. This process includes elements such as fluency, flexibility and original thinking. Therefore, creativity can be defined as the act of transforming ourselves and our environment (Freud, 1923; Şahin, 2016). Torrance (1966) developed the "Torrance Tests of Creative Thinking (TTCT)" in order to measure creativity and provide development methods. These tests use criteria such as fluency, flexibility, originality and elaboration to evaluate the creative potential of individuals. Torrance emphasised that the academic pressures and authoritarian structure at the beginning of school lead to a decrease in children's creativity. At this point, developmental psychology theories should be taken into consideration in order to better understand the relationship between creativity and childhood. According to Piaget's cognitive stage theory, the spatial needs of children between the ages of 5-6 were determined, and interior

space criteria were defined in line with Vygotsky's sociocultural theory based on the approach of "If the appropriate environment/environment is prepared, the child learns". In this context, the relationship between space and human was evaluated within the framework of phenomenological and socio-psychological approaches. In this study, based on the Ministry of National Education (MoNE) pre-school education approach, spatial solutions that support cognitive development that can be experienced in this system are investigated. From a designer's perspective, a design proposal has been developed by determining the space criteria that support creativity in accordance with the MEB's preschool education policies. In the proposed spatial arrangement, environmental arrangements have been made aiming to increase children's cognitive development and creative thinking.

1. Method

This study is based on qualitative research methods and a new model proposal has been developed in line with the data obtained by conducting descriptive case analysis, one of the types of case analysis using purposive sampling and observational data collection methods.

The study was conducted during the COVID-19 pandemic period (January-April 2021) and was carried out in accordance with all measures, obligations and regulations required by the pandemic process. Since the research was conducted within a certain time period, the case study design was deemed appropriate (Creswell, 2003). The main reason for preferring this design is that the study is handled with limited parameters in the context of a specific time and place.

The population of the study consists of all pre-school institutions, while the sample consists of a specific kindergarten. According to Piaget, human beings begin to perceive their environment from 1.5 months of age and this process develops gradually. During the development process, it is known that the child's awareness of space and design increases. For this reason, 10 kindergarten students in the 5-6 age group, which is thought to be the most developed perception process, were selected as the sample. Although the class size was initially 14 students, the sample group was limited to 10 students due to the fact that the parents of four students preferred not to send their children to school during the COVID-19 process. In the selection of the sample, the purposive sampling method was preferred, taking into account the size of the research population. The research was carried out with a total of 10 students, 5 girls and 5 boys, studying in a private preschool institution in Kadıköy, Istanbul. The average age of the participants was 5 years.

The research process was carried out in two stages to explore the relationship between preschool space design and creativity.

In the first stage, the spatial deficiencies of 5-6 year old children in the classroom environment were analysed. In this context, the physical arrangement of the classroom was reviewed, the use of daylight was optimised and play corners were redesigned to increase children's focus. However, as a result of the follow-up interviews with the students, it was determined that the initial changes made were not sufficient to encourage creativity.

In the second stage, a new spatial design model was developed to better support children's creativity. In this process, feedback from children, expert opinions and data obtained from the literature review were brought together. In addition, teachers' perspectives on the revised design were evaluated. Since the study was conducted during the COVID-19 pandemic,

all research processes were carried out in accordance with the regulations regarding the pandemic process.

1.1. Working Group

Due to the size of the population, the research group was formed by using purposive sampling method. In the 'purposive sampling' method, the researcher uses his/her own judgement about who will be selected for the sample and samples those who are most suitable for the purpose of the research. For this purpose, he/she chooses a close and easy-to-reach situation. Therefore, case sampling is seen as a method that accelerates the research (Karasar, 2006). Due to Covid-19 restrictions, the study was conducted with a limited number of participants (10 kindergarten students). Five female and five male students studying in a private preschool institution in Kadıköy district of Istanbul province.

1.2. Design Development Stages

The study was conducted under Covid-19 related restrictions affecting participant access and fieldwork conditions. In line with these measures, it was difficult to find a sample for the study as no one other than parents could be accepted as visitors to kindergartens. Therefore, 'purposive sampling' method was preferred in the study. The field study was affected by Covid-19 restrictions, including the temporary closure of schools and quarantine measures. As a result of the literature study, it was revealed that the child's development process should be taken into consideration as well as architectural design criteria when designing the environment where the child is located. In order to address these deficiencies, a new spatial design model that will enhance children's creative potential has been developed.



Figure1: Methodology Methodology, planning process

1.3. Pre-Design Procedures

The space design proposal integrates Piaget's *Cognitive Environmental Theory* and Vygotsky's *Sociocultural Approach*, aiming to stimulate creativity and at the same time fulfil the interior design criteria. The spatial arrangement was developed using Phenomenological and Socio-Psychological Approaches, emphasising the interaction between the space and its users.

In order to establish a strong foundation, a literature review on preschool education settings was conducted. Observation and interview tools were prepared in accordance with the regulations and guidelines of the Ministry of National Education (MoNE). Permissions were obtained to use validated scales to evaluate the effect of the playroom on creativity.

The study was conducted at the İzci Kindergarten where the existing spatial components were analysed. The data collection process was planned in co-operation with the kindergarten teacher, ensuring that observations and the Creative Classroom Scale were applied at appropriate times. Through spatial measurements and open-ended interviews, various deficiencies in the playroom were identified.

The proposed site design model is structured using F. Ching's 7-stage framework:

- User requirements (needs of children and teachers),
- Activity requirements (types of play and learning activities),
- Furnishing requirements (suitability of furniture and materials),
- Space analysis (lighting, ventilation, heating, material selection, colour scheme and spatial boundaries),
- Dimensional requirements (proportions and ergonomics of space and furniture),
- Desirable qualities (elements that support children's participation and creativity),
- Desired relationships (zoning and interconnection of different fields of activity).

1.4. Data Collection Tools:

Open-ended interview forms were applied to teachers and students after the preliminary spatial analysis, during the first and second stages of the field study, in order to gather qualitative feedback on the existing conditions and the implemented design improvements.

In this study, open-ended interview form for students, open-ended interview form for teachers, creative behaviour observation form scale, creative classroom scale in preschool education were used as qualitative data collection tools. In qualitative interviews, face-to-face interviews, telephone interviews and focus group interviews were conducted with 6-8 participants.

1.4.1. Open-ended Interview Form for Students

In this study, an open-ended interview form was applied to students to gather their opinions about the existing and improved classroom environments. The form aimed to understand students' feelings about the space and their preferences related to the classroom design. Interviews were conducted individually with the students after the spatial modifications were made.

1.4.2. Open-ended Interview Form for Teachers

An open-ended interview form was also applied to the teachers in order to identify deficiencies in the existing space and collect feedback on the proposed improvements. The form consisted of five questions, focusing on aspects such as classroom design, material use, and children's creativity.

1.4.3. Creative Classroom Environment Scale in Preschool Education

The scale used in this study was developed by Dr. Züleyha Yuvacı (Yuvacı, 2018). The scale was created to determine the creativity of classroom environments according to the views of teachers of 6-year-old children attending a PTA institution. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted to determine the validity and reliability of the Creative Classroom Environment Scale. Cronbach's Alpha internal consistency coefficient was analysed to determine the reliability of the scale. As a result of the calculation, Kaiser-Meyer-Olkin (KMO) test was calculated as 0.916.

1.4.4. Scale for Evaluating Creative Learning Environments

The Scale for Assessing Creative Learning Environments was developed by Dr. Figen Kılıç and colleagues to assess the creative learning environments of 5-6-year-old children attending a preschool education institution (Kılıç, Konokman, & Yelken, 2016). The scale was designed to assess various aspects of creativity in early childhood education environments.

The validity and reliability of the Creative Behaviour Observation Form were tested using exploratory and confirmatory factor analyses. The structural validity of the observation form, which consisted of four factors and 26 items, was examined with first level confirmatory factor analysis (CFA). The significance level was set as .05 for all statistical analyses. After the suggested improvements, this scale was administered by teachers for each student individually.

1.5. Data Analysis

The qualitative data collected were analysed using content analysis, focusing on identifying patterns and themes within the interview responses and observations. The transcribed data were systematically coded and recurring themes were categorised using an inductive approach. A thematic framework was used to group relevant responses into overarching categories. The results were then interpreted on the basis of child development theories and spatial design principles to assess the impact of classroom modifications on children's creativity and engagement.

1.6 Validity, Reliability and Ethics

In this study, data related to the process were collected and enriched with detailed direct quotations. The coding of the data and the development of the themes were carried out in co-operation with the researchers and the reliability of the process was ensured by the evaluations made by the field experts. In particular, a researcher specialised in Educational Sciences and

another researcher experienced in qualitative research made the necessary evaluations. During the qualitative data analysis, the formula $\text{*Reliability} = \text{Agreement} / (\text{Agreement} + \text{Disagreement})$ proposed by Miles and Huberman (1994) was used to calculate inter-rater reliability. The general agreement coefficient was determined as .80 and it was seen that the reliability of the data analysis was ensured.

2. Findings

2.1. Findings Related to the First Objective

What are the descriptive differences before and after the model proposal that develops creativity in children in preschool space?

In order to plan the data collection process, the days when children were available were determined with the kindergarten teacher and the creative classroom scale in preschool education was applied to the teacher. As a result of spatial measurements and open-ended interviews, deficiencies in the playroom were identified (Table 2).

Designing physical environments that meet the developmental needs of children is important not only in terms of pedagogical approaches, but also within the framework of legal regulations and standards. The MEB Minimum Standards, which determine the minimum physical conditions that pre-school education institutions in Turkey must meet, serve as a basic guide in this regard.

Table 1: Guidelines for Minimum Design Standards for Educational Buildings and Kindergartens 2015 (MEB, 2015)

<i>Planning</i>	<i>Description</i>
Alan	Area per person min. 2,40 m ²
Doors	The door width of classrooms and other classrooms with a quota of up to 20 classrooms should be at least 80 cm. (MoNE;2015) Doors should open towards the exit/escape direction regardless of their location and position.
Window	From the finished floor slab min. 90cm. should be started from above. *Windows with large openings should have both small and large partial openings.
Flooring	Kindergarten floors should be covered with PVC based material. It should be hygienic, friction and impact resistant, low maintenance and non-slip. * In cases where carpets, wood, PVC-like flooring materials are used for flooring in training areas and support spaces, the fire resistance of the selected materials must be class A.
Ceiling	It should be covered and painted with building materials that are easy to clean and do not require much maintenance and repair. If suspended ceilings are used, plasterboard suspended ceilings should be preferred.
Walls	Water-based paints that can be easily cleaned should be preferred. Epoxy paints resistant to impact and friction should be preferred at the lower levels of the walls. In cases where epoxy paint is not used, oil paint should be used in these areas.
Daylight/Ventilation	The classroom should be designed so that daylight comes from the left side for the student. It should be away from noisy environments and should be suitable for sun and natural ventilation.
Lighting	Lighting level should be at least 100 lüx. Sockets, panels and devices directly connected to electricity should be placed in places where students cannot easily reach and necessary safety precautions should be taken.

Furniture	Lockers According to the type project and detail, student lockers can be planned inside or outside the classroom. The bodies and doors of the cabinets will be made of 18 mm thick coloured chipboard (chipboard) material, the depth of the cabinet will be 33 cm + 2 cm for a total of 35 cm, width 35 cm, height 70 cm and locked. The cabinets will be placed two rows on top of each other according to the class size (30 people).
Additional information	All electrical cables must be concealed and sockets must be placed at a height (1.5 m) out of the reach of children. Natural gas, water and electricity installations should be out of the reach of children. There should be no sharp areas (thresholds, slamming doors, table corners, coffee tables, etc.) in the building that can harm children (Poyraz & Dere, 2012).

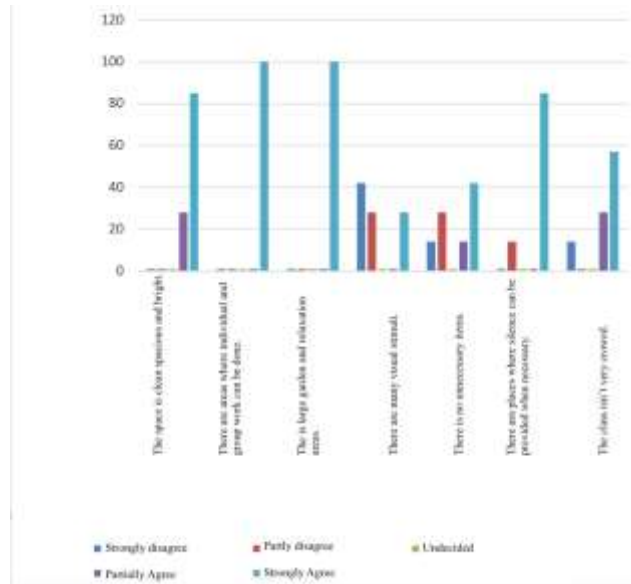
These standards (MEB, 2015) should be supported by design criteria, spatial elements and elements that define and complement the space (Table 1). When the studies on early childhood are examined, it is clearly seen how important the environment prepared in different educational approaches is for the child. When pre-school education systems are examined, it is seen that Montessori, Waldorf and Reggio Emilia are approaches that adopt a child-centred education approach and have a high percentage of implementation compared to others. Minimum standards were taken into consideration in determining the current situation.

2.2. Findings Related to the Second Sub-Aim

What is the effect of creative space on children to develop creativity in preschool education?

Under this heading, the data obtained through the application of the Scale for Evaluating Creative Learning Environments to assess the effect of the preschool creative space/learning environment on children are presented in Table 3.

Figure 2: The effect of creative space in preschool education on the development of children's creativity



According to Table 3, students described the space as clean, spacious, bright and of sufficient size. However, they also emphasised the presence of unnecessary items in the classroom and stated that the visual stimuli in the space were low.

Table 2: Identification of Deficiencies in the Current Situation and Suggestions

<i>Identification of Deficiencies in the Current Situation</i>	<i>Suggestions for Improvement to Overcome Deficiencies</i>
<ul style="list-style-type: none"> - The sharp parts of the straps are not designed to prevent injury to children. - Not all cupboards in school classrooms have carved handles on the drawers and doors. The height of the cupboards is not high enough for children to reach. - There are visual accessories that are not used in the classroom and have no function. - Cork board cannot be used because it has a very hard surface. - Since there is no puppet corner, the puppets in the classroom are above the height of the child's reach and stand as ornaments. - High ceiling height - There are missing game corners. - The classroom gets a lot of light and the temperature rises during the day. For this reason, the playroom cannot be used during the day and other play areas are used. - Coloured roller blinds are used on the windows above the doors. The light reflected from the coloured blinds disrupts children's concentration during the activity. - The m2 per child is small. - Since the board games do not fit on the shelves, they are stuck on the floor between the cupboard and the wall. 	<ul style="list-style-type: none"> - A solution was found for the problem that the playroom selected as an example was hot due to insufficient m2 as well as insufficient light. The location of the playroom in the building was changed. The five-six year old playroom was moved to the opposite pole, to a room with a larger area and indirect sunlight. - Instead of play cabinets at different heights, play cabinets at the same height were placed within the reach of children. - A previously unused nursery corner and a puppet corner were added to the room. - Coloured roller blinds were replaced with roller blinds reflecting white light. - A table of numbers was hung instead of a cork board. - A storage unit with Montessori-inspired materials was extended along the wall surface to provide a more organised space for learning tools. - An unused teacher's locker was cancelled. - The toy shelves are lowered to a height accessible to children. - The unusable wall board mentioned in the teachers' comments was removed and replaced with number visuals that did not exist before. -The number of cabinets to be used by the teacher was reduced according to the teacher's request and the toy shelves were reduced to a level that children could reach. -The unnecessary wall board mentioned in the teachers' opinions was removed and replaced with number visuals that were not present in the address before. -The number of cabinets to be used by the teacher was reduced according to the teacher's request. Toy shelves were reduced to a level that children can reach.

An improvement proposal was designed and implemented using the existing furniture, taking into account the theory of child development, interior design criteria, interview form and scale results. The changes made within the scope of this proposal are summarised below.

As part of these improvements, a storage unit containing Montessori-inspired materials was extended along the wall surface to provide a more organised space for learning tools. This arrangement allowed previously unorganised materials to be neatly stored within the existing shelving system.

After the improvement, the space was presented to the student experience. Data on students' opinions about the improvement proposal were collected and analysed. The results obtained from the open ended interview form applied to the study group are presented below.

Students' responses to the interview questions are shown in Figure 3, Figure 4, Figure 5 and Figure 6.

2.3. Findings Related to the Third Sub-Aim

Opinions about what students enjoyed after the creative space was designed in preschool education are given below.

Figure 3: Actions that children like to do in the developed creative space

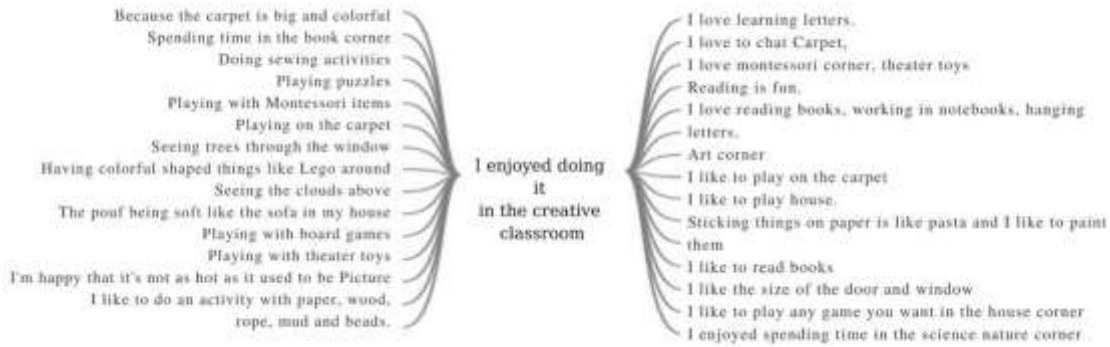


Figure 4: Teacher's use of visual, auditory, olfactory, etc. stimuli in the creative field

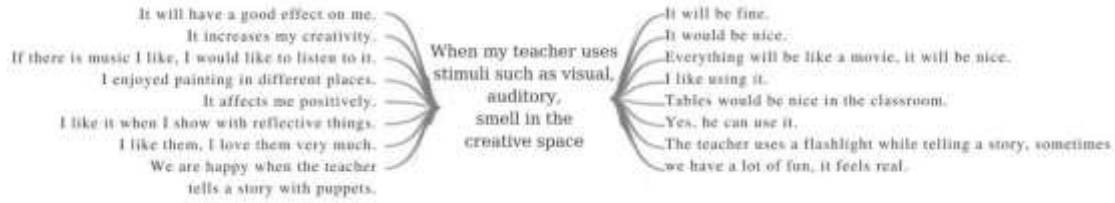
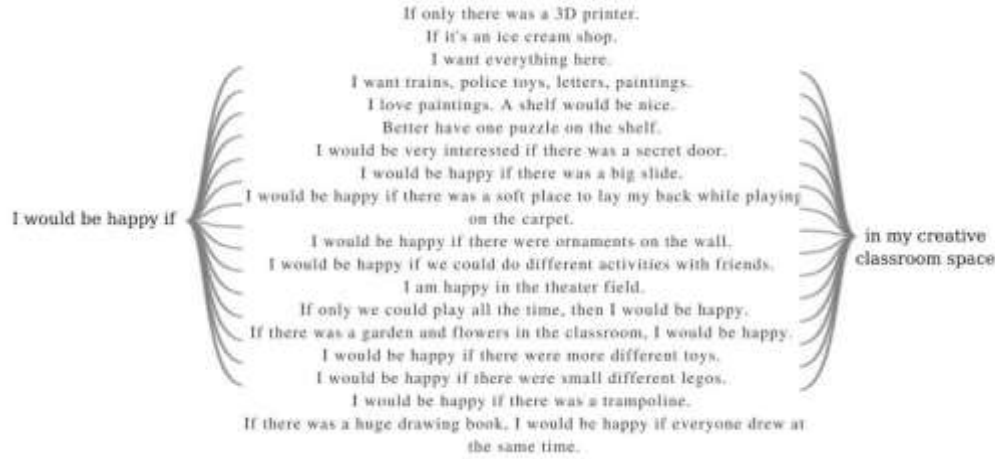


Figure 5: Children's views on the ventilation of the area that triggers creativity



Figure 6: Elements that the child would be happy to add to the creative space



According to the students' opinions in Figure 4, while there is a significant difference in creativity in the classroom, there is a complaint about the insufficiency of the space allocated to the drama/homemaking corner. There should be a drama corner in the learning area. In Yaşar's (2009) study, the effect of drama education on the creative thinking skills of 6-year-old children attending kindergarten was proved by experiment. At the same time, children stated that they did not play with Montessori toys with maths-logic content. According to Yıldırım (2014), it was experimentally proven that creative problem solving activities in preschool period affect children's creativity.

2.4. Findings Related to the Fourth Sub-Aim

What is the defining difference between before and after design that reveals the creativity of the preschool space?

This study aims to develop child development and creative thinking skills in children in a 5-6 years old learning environment (with the design of interior furniture, equipment and complementary elements) in a PTA. In line with this goal, the space in the institution was analysed and needs were determined (Table 3). An example of a space that will make children feel certain values such as trust, dignity, belonging, emotionality and aesthetic perception, especially creativity, has been created.

Table 3: Descriptive difference before and after the design revealing the creativity of the preschool space

<i>Before Design</i>	<i>After Design</i>
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As a result of spatial measurements, the application of the Creative Classroom Environment Scale, and open-ended interviews, deficiencies in the playroom were identified.

-The sharp parts of the hangers are not designed to prevent injury to children.

-Carved system handles were not used on the drawers and doors of all cabinets in school classrooms.

-Tall cabinets are not at a height that children can reach.

-There are visual accessories that are not used in the classroom and have no function.

-Mushroom board cannot be used because it has a very hard surface.

-Since there is no puppet corner, the puppets in the classroom are much higher than the child can reach and stand as decorations.

-High ceiling height.

-There are missing game corners.

-The classroom gets too much light and the temperature rises during the day. Therefore, the playroom cannot be used during the day and other play areas are used.

-Coloured blinds are used on the windows above the doors. The light reflected from the coloured blinds disrupts children's concentration during the activity.

-The number of square metres per child is low.

-Table games do not fit on the shelves, so they are stuck on the floor between the cupboard and the wall.

-The space does not offer any opportunities to develop children's creativity.

-Children go out into the garden to run, have fun and spend their energy. In winter, however, this is not possible.

-The corner that affects creativity the most in the classroom is the drama corner.

In line with the deficiencies identified, a location for the playroom was proposed.

-Furniture and accessories in the classroom are designed with children's safety in mind. A special hanger design is placed in the space to develop the child's problem solving ability.

-Carved system handles were used on the drawers and doors of all cabinets in the school classrooms.

-Tall cabinets, shelves, toys and presentation boards are at a height that children can reach.

-Every visual in the classroom has a specific purpose.

-An area where children can exhibit their handicrafts has been created. In this way, it is aimed to give self-confidence to the child.

-All play corners prescribed by the Ministry of National Education are included in the classroom. In particular, there is a homemaking/drama corner, a science and nature corner and an art corner, which will greatly improve the child's creativity by using problem solving skills that develop the child's imagination.

-Suspended ceiling was used to reduce the ceiling height. Cloud-shaped lighting was used to increase the brightness in the corners where the Lux value is low. At the same time, since high ceilings cause the child to lack self-confidence, remain passive in the game and become asocial in relationships, the ceiling height was tried to be made low through design. The wall floor was painted in two different colours to make the child perceive the space as lower.

-During the implementation of the improvement proposal, the location of the playroom, which received too much light and was too hot, was changed within the building. Thus, the temperature problem was eliminated and the time children spent in the playroom increased.

-White blinds are preferred on the windows to avoid distraction of the child.

-When the improvement proposal was implemented, the m2 per child was solved by moving to a larger classroom.

-Board games were placed on the shelves as needed. Excess games were removed to the cupboard to be placed on the shelves every 3 months. The cupboard was not designed as a cupboard but as a lighted seasonal table so that children would not be curious and look at it.

-In the playroom, areas that require children to be more active, such as the cleaning corner and the art corner, are designed in yellow (warm tone).

-The radiator in the classroom has been removed. As children play on the floor, it is recommended to provide more efficient underfloor heating for children.

-It has designed a play unit where children can release their energy without going out to the garden in summer and winter. In this play unit, there are two educational corners (housekeeping and reading corner). Access to these corners is provided by a ramp. With the interlocking plastic stones placed on the ramps, the child can create his/her own path. The child will use his/her motor skills while placing the plastic stones in the hole and problem solving skills while creating a path for himself/herself.

-The drama corner is designed in a simple way to allow the child to create his/her own play. While the slits on the surface of the play unit allow children to move under the supervision of the teacher, it is tried to provide a comfortable and spacious movement area for the child.

-In the art corner; it is aimed to create a free space for the child. Wall surface was used to save space. In order for the child to experience different materials, both rolled paper and a blackboard hanging on the wall were used.

-Soft and hard materials are used together on the floor so that the child can experience different textures. Cork, cushions, wooden parquet were used.

2.3. Findings Related to the Fifth Sub-Aim

What are teachers' views on the development of creativity in children in preschool education?

The following findings were derived from the open-ended interviews conducted with the participating teachers. Teachers' opinions were collected through open-ended interview questions. Based on the teachers' responses, their views were categorised according to the components of creativity (fluency, flexibility, originality and elaboration) by the researcher in collaboration with an expert in the field of Educational Sciences. The categorisation was based on the content of the teachers' statements and the examples they gave, rather than their prior knowledge about these components of creativity. This methodological approach facilitated a more comprehensive and systematic understanding of how teachers perceive creativity in the proposed field design and how this perception is manifested in children's behaviour and activities.

Fluency; Teachers agree that fluency can be shown in various actions and movements of children.

'In activities, children learn by imitation. Children can produce more original ideas when they imitate observed movement skills.

Flexibility; Classroom teachers stated that children can use their past learning in the new model.

'Children already know some animal movements, so they can use this for creative activities. For example: sea creatures, horse, etc.'

'It would be good to include visuals in the space. Children will have the opportunity to recognise different creatures in nature, maybe these can be changed every week and different

visuals can be added to the clouds, maybe birds, planes, rockets etc. They can imitate the movements of these creatures'

'The ramp is a good solution, they may like it very much. It can be a bit challenging to remove the handles and wait for them to put them on the next step'

'Children can use their experience of dance such as jazz, ballet, etc. to create a series of new movements by adding their own ideas. A soft floor is conducive to this. Also providing a variety of stimuli such as videos, pictures, photographs and verbal narration can help children to imagine and create.

Authenticity; 'The corner where children show their authenticity best is the homemade/drama corner where we do "creation and expression" activities. Most of the children are eager to be different and original, it will be very important to give them this space.

"It's a good idea to have more basic, simple toys so they can build the game they want.

"Children's creativity is so unexpected that when they perform in different groups, we encounter different outputs with their own style. According to the findings of the study, it is seen that the creative space design developed has an impact on students and teachers.

3. Conclusion, Discussion and Suggestions

3.1 Conclusion

The findings of this study provide a starting point for in-depth discussion and research on the development of children's creativity in kindergartens on the Asian side of Istanbul. It is intended to pave the way for further research on the design of play corners and teaching strategies that encourage creative thinking. Although changing the space has a positive impact on the development of children's creativity, the limited knowledge, skills and experience of teachers seems to be a challenge they face in promoting children's creativity.

There are two important results of this study. First, teachers realised the importance of encouraging children's creative thinking. Second, they realised that the classroom space can be a supportive tool in this process. In this context, the proposed space design should be used throughout the academic year, not for a short period of time. In addition to the space, attention should be paid to the toys used and the necessary importance should be given. A space designed in line with children's views encourages children and gives them a sense of confidence.

3.2. Discussion

This study reveals that the "space design model" proposal can develop the child's creative thinking ability through space and can guide the designers in the design process of preschool education institutions (PECs). The learning spaces that should be present in playrooms in preschool education institutions are limited to the Housekeeping Corner (Dramatic Play), Art Corner, Block Corner, Puppet Corner, Library Corner and Science-Nature-Science Corner determined by the Ministry of National Education (MoNE, 2015). However, it would be appropriate to add a gross motor skills area that supports creative development and an additional area that encourages problem solving skills.

The results of this study are in line with the findings of Turhan (2016), who showed that an enriched environment positively affects children's participation and creativity. However,

while Turhan (2016) focuses on cognitive aspects, this study also emphasises the emotional and social dimensions of enriched learning spaces. Öncü (2017) concluded that the presence of different materials in learning centres not only enriches the space but also improves children's creativity and decision-making skills. The findings of this study also show that various interactive materials in playgrounds contribute to children's cognitive and decision-making skills. This supports Öncü's (2017) conclusion emphasising the importance of various stimulants in early childhood education environments.

Although 40% of the students think that there is not much visual stimuli in the classroom, Turhan (2016) found that multi-stimulus educational environments are more effective on concept development and permanence of concept development in children. For this reason, there should be visual stimuli in the classroom that are of high quality and suitable for the function defined for the space. While the physical environment plays an important role in encouraging creativity, the teacher's ability to use these spaces effectively is equally important. İşler (2002), Özel (2015) and Erdoğan (2006) suggest that teachers' attitudes towards creativity can increase or limit children's participation in creative learning spaces. The findings of this study suggest that while an enriched environment provides opportunities for creativity, teacher guidance remains important in maximising these benefits.

3.3. Recommendations

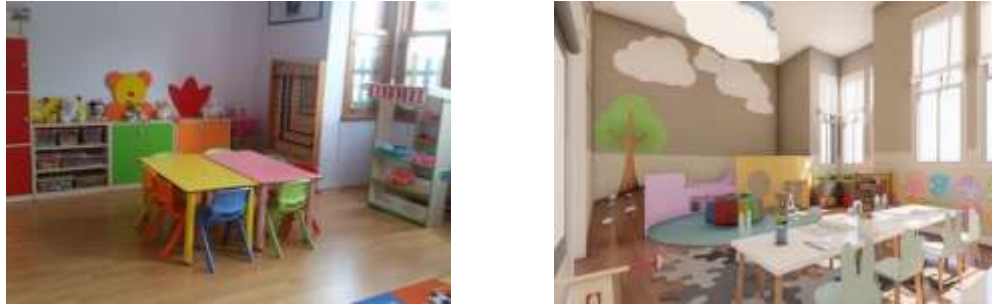
Suggestion for Improvement	Proposed Space Design Model
Figure 7: Adaptation of the Improvement Proposal to the kindergarten classroom and the proposed space model	



Figure 8: Adaptation of the Improvement Proposal to the kindergarten classroom and the proposed space model



Figure 9: Adaptation of the Improvement Proposal to the kindergarten classroom and the proposed space model



In the proposed space model, functional and modular furniture solutions have been developed with the necessary accessories. The use of saturated colours in certain areas with a predominance of chromatic greys in light tones allows children to distinguish these colours more easily. These colour schemes have been applied in a way that minimises visual strain and creates a natural effect similar to landscape design. All furniture is designed with modular systems that can be adjusted and transformed according to the number of users. In addition to sketching and modelling studies, furniture layout plans and alternatives for different table configurations were developed as part of this study. The design approach aims to create playgrounds that are compatible with children's natural impulses such as movement, tactile exploration and creative participation (Çiftıldız & Aktaş, 2020). In order to enrich sensory experiences, various surface textures, colours and materials such as cardboard, plastic boxes of different sizes, clay, play dough and mud were integrated into the space (Kılıç & Şahin, 2004). As a result, grey tones were used on large wall surfaces and balanced colours were used in the remaining areas to support children's focus. In addition, interviews and questionnaire results revealed that most of the children in the classroom wanted animal figures to be included in the space. Accordingly, animal figures were integrated into the areas where numbers and letters were displayed to support children to develop a sense of belonging to the learning environment.

Consequently, learning environments should be designed to be engaging, dynamic and stimulating in a way that encourages both creativity and autonomy in children. All stakeholders in education - children, families, educators and architects - need to develop awareness. In this context, it is important to collaborate more closely in the design process and work together to provide appropriate spaces to improve the quality of pre-school education spaces (PECs). This collaboration will contribute to the creation of space designs that both support children's creativity and make educational processes more effective. For future studies, the model can be tested, or the furniture designed within the model can be produced and evaluated by children, and further studies can be conducted based on their feedback.

References

- Açıkgöz, K. Ü., Özkal, N., & Kılıç, A. G. (2003). Pre-service teachers' perceptions of classroom atmosphere. *Hacettepe University Journal of Faculty of Education*, 25, 1-10.
- Aslan, N., & Cansever, B. A. (2009). Teacher attitudes towards the use of creativity in education. *TÜBAV Science Journal*, 2(3), 333-340.
- Bogoyavlenskaya, D. B. (2013). The nature of changes in creativity scores in preschool and primary school children. *Procedia - Social and Behavioural Sciences*, 86, 358-362.

- Bulut, A. (2020). Examining the attitudes of preschool education stakeholders towards children's rights. *Manas Journal of Social Research*, 9(4), 2067-2078.
- Canbolat, T. Ö. (2017). Colour harmony in interior design. *Çukurova University Journal of Institute of Social Sciences*, 26(3), 287-301.
- Capel, S. A. (1986). Psychological and organisational factors related to burnout in sport instructors. *Research quarterly for exercise and sport*, 57(4), 321-328.
- Chan, T. W. (1995). Artificial agents in distance education. *International Journal of Educational Telecommunications*, 1(2), 263-282.
- Creswell, J. W., & Creswell, J. D. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches (2nd ed.)*. Sage Publications.
- Çelebi Öncü, E. (2017). *Investigation of learning centres that preschool children construct in their classrooms*. *Kastamonu Journal of Education*, 25(2), 733-746.
- Çelik, M., & Yazar, A. (2009). Teachers' opinions on kneading materials used in art activities in preschool education institutions. *Journal of Art*, (16), 45-54.
- Çiftçiyıldız, Ö. Ü. K., & Aktaş, E. (2020). The relationship between colour and space in terms of efficiency in preschool education institutions. *Journal of Social Sciences*, 187.
- Edwards, C., Gandini, L., & Forman, G. (2012). *Children's face language: The Reggio Emilia experience in transformation (3rd ed.)*. Praeger.
- Elibol, A. G. G. C., Kılıç, A. G. Y., & Burdurlu, E. (2006). Material use in preschool children's toys and colour preferences of 4-6 year old children. *Journal of Social Policy Studies*, 9(9), 35-44.
- Erdoğan, M. Y. (2006). Relationships between creativity, teacher behaviours and academic achievement. *Electronic Journal of Social Sciences*, 5(17), 95-106.
- Freire, P. (1991). *Pedagogy of the oppressed* (D. Hattatoğlu, & E. Özbek, Trans.). Ayrıntı Publishing House. (The original work was published in 1982).
- İrızık, S. (2004). Reading as a woman after the death of the subject. In J. Parla and S. İrızık (Eds.), *Kadınlar dile dile düşünce* (pp. 35-56). İletişim.
- İşler, A. Ş., & Bilgin, A. (2002). Education faculty classroom teaching candidates' thoughts about creativity. *Journal of Uludağ University Faculty of Education*, XV(1). 133-152.
- Kara, Ş. (2007). The imaginary function of space and violence in fantastic children's books. *Çankaya University Journal of Faculty of Arts and Sciences*, 1(7), 61-72.
- Kara, Ş., & Şençiçek, S. (2015). Problems and solution suggestions in raising creative children. *Adnan Menderes University Faculty of Education Journal of Educational Sciences*, 6(2), 90-97.
- Karasar, N. (2006). *Research Methodology*. Ankara: Nobel Publication Distribution.
- Kılıç, F., Konokman, G. Y., & Yelken, T. (2016). Developing a Scale for the Evaluation of Creative Learning Environments: Exploratory and Confirmatory Factor Analysis. *Journal of Education and Training Research*, 4(12), 37-47.

- Kılıç, M., & Şahin, F. T. (2004). The effect of preschool geometry education programme on children's geometry skills and figural creativity. *Journal of Ondokuz Mayıs University Faculty of Education*, 40(1), 231-256.
- Koyuncu, B., & Erden, M. (2010). Student views on enriched brain-compatible teaching environment. *Journal of Educational Administration in Theory and Practice*, 1(1), 73-92.
- Mccoy, J. M., & Evans, G. W. (2002). The Potential Role of the Physical Environment in Fostering Creativity. *Creativity Research Journal*, 14(3-4), 409-426.
- McMillan, J. H., & Schumacher, S. (2010). *Research in education: Evidence-based inquiry* (7th ed.). Pearson.
- McNaughton, B. L., Battaglia, F. P., Jensen, O., Moser, E. I., & Moser, M. B. (2006). Path integration and the neural basis of the 'cognitive map'. *Nature Reviews Neuroscience*, 7(8), 663-678. <https://doi.org/10.1038/nrn1935>
- Ministry of National Education (MoNE). (2015). *Primary education special field competences* <https://oygm.meb.gov.tr/www/ilkogretim-ozel-alan-yeterlilikleri/icerik/257>. Access date: 13.12.2019.
- Ministry of National Education (2015). *Preschool education and primary education institutions standards* meb.gov.tr/meb_iys_dosyalar/2016_01/27110005_07.04.2015_kilavuzktap_gncel.pdf
- Özel, A., & Bayındır, N. (2015). Classroom teachers' instructional behaviours towards developing creativity in students. *International Journal of Turkish Educational Sciences*, (5), 348-358.
- Özer, M., & Polat, A. Y. (2019). Examining the experiences of parents at different socioeconomic levels towards developing creativity in preschool period. *Journal of Qualitative Research in Education*, 7(3).
- Özerbaş, M. A. (2011). The effect of creative thinking learning environment on academic achievement and retention of knowledge. *Journal of Gazi Faculty of Education*, 31(3), 675-705.
- Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Sage Publications, Inc.
- Polat, M. (2017). *Investigation of classroom teachers' critical thinking tendencies and creativity levels according to some variables* (Publication No. 457397) [Doctoral dissertation, Adıyaman University Institute of Social Sciences]. YÖK. <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>
- Rachmawati, R., Murdowo, D., Sarihati, T., & Hanom, I. (n.d.). *Playroom interior cladding study for early childhood*. Google Scholar. <https://scholar.google.com/citations?hl=en&user=7jRWI38AAAAJ>. Retrieved from
- Read, M. A., Sugawara, A. I., & Brandt, J. A. (n.d.). *The influence of space and colour in the physical environment on preschool children's cooperative behaviour*. Google Scholar. Retrieved from <https://scholar.google.com/citations?hl=en&user=MfYPvbkAAAAJ>.

- Sarıtaş, E., Şahin, Ü., & Çatalbaş, G. (2016). Problems encountered with foreign students in primary schools. *Pamukkale University Journal of Institute of Social Sciences, (Annex 1)*, 208-229.
- Shojaei, L., & Shahbazi, M. (2016). Investigating effective factors in designing educational spaces with the approach of increasing learning rate and developing creativity among children. *Journal of Education and Learning*, 5(2), 66-72.
- Sönmez, N., Alptekin, S., & Bıçak, B. (2018). Preschool education teachers' self-efficacy perceptions and servant training needs in inclusive education: A mixed method study. *Abant İzzet Baysal University Journal of Faculty of Education*, 18(4), 2270-2297.
- Summak, E. G., & Aydın, Z. (2011). Creativity in national education programmes and research on creativity. *E-journal of New World Sciences Academy*, 6(1), 362-385.
- Toyran, G. (2015). *Investigation of preservice preschool teachers' creative thinking levels and critical thinking tendencies in terms of some variables* (Publication No. 418037) [Master's thesis, Dokuz Eylül University]. YÖK. <https://avesis.deu.edu.tr/yonetilen-tez/6f33360c-f8d9-4fdd-b97d-f708f0119f26/okul-oncesi-ogretmen-adaylarinin-yaratici-dusunme-duzeylerinin-ve-elestirel-dusunme-egilimlerinin-bazi-degisenler-acisinden-incelenmesi>
- Turhan, H. (2016). *The effect of multi stimulus educational environments on students' reading comprehension and written expression skills* (Doctoral dissertation, Ankara University (Turkey)).
- Vardi, Ö., & Demiriz, S. (2019). Preschool teachers' views on children's curiosity. *E-Kafkas Journal of Educational Research*, 6(4), 44-58.
- Vygotsky, L. S. (2004). Imagination and creativity in childhood. *Journal of Russian & East European Psychology*, 42(1), 7-97. <https://doi.org/10.1080/10610405.2004.11059214>
- Woods, A., Fletcher, P., & Hughes, A. (1986). *Statistics in language studies*. Cambridge University Press.
- Wortham, S. C., Barbour, A., & Desjean-Perrotta, B. (1998). *Portfolio assessment: A handbook for preschool and primary educators*. International Association for Childhood Education.
- Yalcin, M. (n.d.). *Progressive development of creative design skills from kindergarten education*. Google Scholar. <https://scholar.google.com/citations?hl=tr&user=rERIr2cAAAAJ>. Retrieved from
- Yaşar, M. C., & Aral, N. (2010). The effect of preschool education on creative thinking skills. *Journal of Theoretical Educational Science*, 3(2), 201-209.
- Yuvacı, Z. (2018). *Examination of creativity levels of 6-year-old children receiving preschool education according to the creativity of their teachers and classroom environments* (Publication No. 486042) [Doctoral dissertation Gazi University Institute of Educational Sciences]. YÖK. <https://avesis.gazi.edu.tr/yonetilen-tez/4ad1403c-b85a-4130-ab2d-321ed064337d/okul-oncesi-egitim-alan-6-yas-cocuklarinin-yaraticilik-duzeylerinin-ogretmenlerinin-ve-sinif-ortamlarinin-yaraticiliklerine-gore-incelenmesi>