

# Early Cognitive Skills through the Setting of Play-Design

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## Abstract

Considering the educational role that play activity undertakes in the early childhood, it is critically important for the multi-dimensional development of the children. It is also effective on improving their problem-solving skills and positive experiences. Space design and toy selection play an important role among the dimensions to be considered in the play therapy process. Play is main process effective benefits from instruments and toys for children to develop functional thoughts and behaviors. Cognitive and Behavioral Development is frequently used for children's psycho-motor, cognitive, social, emotional, language and personality development. As a result, the concepts of accessibility/ergonomics, security, aesthetics, personal space, creativity, order, compulsion, hierarchy and autonomy were addressed in terms of the child-design relationship, and the importance of children playing an active role was emphasized by designing flexible, transformable with rich physical stimuli that supported the development of imagination, curiosity and creativity. Within the scope of the study, play-design relationship is discussed by focusing on how the act of children behavior and learning can be supported.

## Keywords

Play, Design, Early-Childhood, Cognitive Development

## 1. Introduction

According to Froebel (1904), "Play is the greatest reflector of individual development in early childhood". Play includes real-life experiences and elements related to them in children's lives. Children learn to express themselves and socialize by displaying their curiosity and creativity very openly through play. In other words, children rediscover the environment they live in while playing. Montessori,

Piaget, Vygotsky and Waldorf Play Theories included in the study address child development from different aspects. According to Parry and Archer (1974), play has two aspects; the first is to keep children in the play area; the second is the educational aspect of play. Versatility and the ability to respond to the changing mental needs of the child are the most important educational points for play areas. Therefore, the instrument which the play is played is equally important as the play in child development (Gibson, 1986). Because the effect of this design on the physical, mental, social, sensory and psycho-motor development of children is quite important. Children's stimulation and experience affect children's development and perception providing the opportunities. Therefore, children's development and needs should be well understood and the design instruments should be structured with the right stimuli in terms of child requirements, and the child-play relationship should be designed in terms of stimuli and experiences in which the child can be active. It is based on the child's learning and experience. In addition, the main purpose in child development is to create opportunities which children can explore their ideas, offer flexible, thought-provoking diversity, and meet their psychological needs (Poyraz & Dere, 2003). The experience that play provides: Stimulation, Creativity, Encouraging, Challenging, Motivation, Imagination, Multi-Purpose, Critical Thinking, Socialization (Gürbüz et al., 2021; Hughes, 2009; Read, 2007; Alqudah, 2003; Moore et al., 1996). Play Design: child development, developmental characteristics, anthropometric and psychosocial data, age-gender, Functional objectives; Comfort, Aesthetic, Warmth, Easy Usage, Colors, Softness, Adaptability, Luxurious (Hughes, 2009; Alqudah, 2003; Korpella et al., 2002; Gür And Zorlu, 2002). And finally, Ergonomics, Size, Hygiene, Healthy, Accessibility, Sensitivity, Flexibility, Security. All these objective of design criteria that should be considered when creating a play.

A rich content play experience designed considering the differences of each child can establish relationships through the areas of interest they have acquired. It is emphasized that the idea should be consistency in qualitative experience criteria and the style of interaction design should be specified (Dudek, 2012).

Hypotheses:

H1: There will be a difference in design criteria between designers and child development experts in terms of cognitive evaluations;

H2: There will be a difference in the functional design criteria between child development experts and designers play instruments.

## **2. Children Cognitive Development and Design Theories**

### **2.1. Design Theories**

Children recognition of objects, the concept of learning's has revealed through "Experimental Psychology" that there is a close connection between the learning processes and levels of children and the environment. The fact that the stimuli created by the physical and social environment turn into an experience, discovery

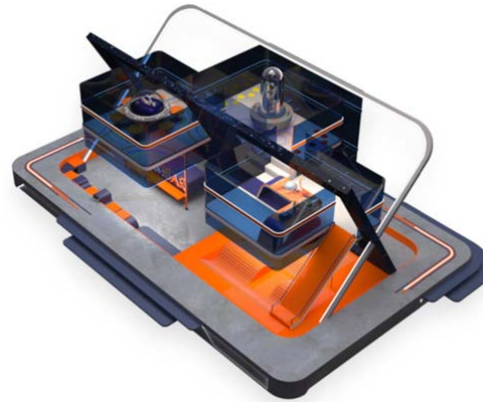
and learning for children (Dudek, 2012; Gür & Zorlu, 2002; Weinstein, 1987; Moore et al., 1996). Many theories have developed regarding these learning processes and concepts. According to one of these, critical theory, critical pedagogy can challenge the everyday activities and practices that people are familiar with, exploring the relationship between power and knowledge (Sanoff, 1995).

Ecological systems theory is a system that interconnects the experiences of individuals with an environmental perspective on child development. The physical content of the play design is based on the concrete stages of the experience. According to Moore et al. (1996) physical content, physical elements, design-supporting and impressive elements affect the user psychologically (Korpella et al., 2002). Experience uses metaphor or theme infrastructure elements with the perspective of the design concept supporting the physical content. Effective psychological content is concise, strong, reflects all sensory elements and is like all comprehensible equipment (Pallasmaa, 2005).

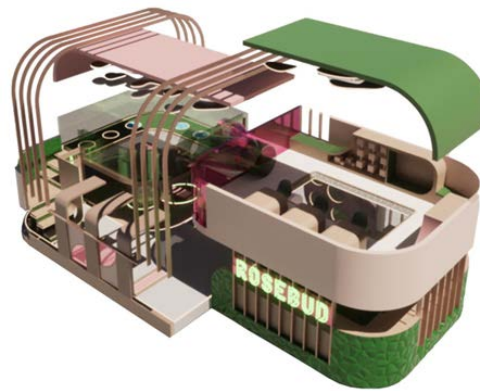
## 2.2. Play as An Early Learning Setting

Development is a multifaceted and complex process. Children constantly grow, change and improvement. It would be correct to interpret this process holistically because each developmental area affects each other (Day & Miiidbjjer, 2007). For Piaget, development is a process of change in which children, which is discovering their world, revise their knowledge in a way that more closely matches reality and thus reach a state of balance between their knowledge and the nature of the physical and social world. Vygotsky (1978) viewed development as a socially transmitted process and argued that children acquire knowledge and skills through dialogues with more skilled and experienced members of their society. From the moment a child is born, they change and progress in different aspects. It is possible to talk about many different parameters for this process to proceed healthily without interruption. One of the key elements of development, especially in early childhood, is learning. In childhood, the response to learning motivation occurs primarily through play. Play is one of the most effective teachers of a child's development period. It plays a major role in children's fun, learning, relaxation, growth, and self-discovery. To sum up, play is an indispensable tool for children's Stimulation, Creativity, Encouraging, Challenging, Motivation, Imagination, Multi-Dimensional, Critical Thinking, Socialization development. Therefore, the educational aspect of play activity is of critical importance, especially in early childhood. It is inevitable that play activities that contribute to all areas of child development will be one of the basic learning tools of a well-organized learning and behavior setting. Play greatly affects the child's mental, physical, emotional and social development.

Considering the educational role that play activity undertakes in the early childhood, it is critically important for the multi-dimensional development of the children (Bell, 2002; 2006). In relation to this, the interactive characteristics of the designed objects and spaces, which take place, come to the fore. Since the



**Figure 1.** Astroit.



**Figure 2.** Seed.

opportunities of interaction establish in childhood directly affect physical and mental development, should shape the design criteria appropriate with their development. Such as **Figure 1** and **Figure 2**; both play spaces are designed for stimulating cognitive development. Both of them are for playing boxes where children learn according to their themes through play. The variety of stimuli encountered by the child through their surroundings interacting provides supportive and holistic development. They have to encounter in the physical and social environment turn into experience, discovery and learning for children. Therefore, the more the experiences in the early childhood are differentiated, the better development in various areas are supported.



**Figure 3.** Physical, functional and cognitive dimensions of play-children development.

The study mainly focused on play through design for early development. As a result, the concepts of Stimulation, Creativity, Encouraging, Challenging, Motivation, Imagination, Multi-Dimensional, Critical Thinking, Socialization were addressed in terms of the child-design relationship, and the importance of children play an active role was emphasized by designing flexible, transformable with rich physical stimuli that support the development of imagination, curiosity and creativity (**Figure 3**). Within the scope of the study, play-design relationship is discussed by focusing on how the act of children behaviour and learning that can be supported.

### 3. Result and Discussion

This study is supported by literature research on play and its design criteria on children's mental development. Thus, in line with the answers given and the research conducted, the design criteria of play will be determined. The research environment was collected by applying a survey technique in order to evaluate the play and design criteria of child development and designer experts in Ankara in 2022-2023 as an expert opinion. The reliability statistic of Cronbach's Alpha Test result was 0.83 with 9 participants.

**Table 1.** Demographic changes of the participants.

Demographic Changes								
Gender	Women			53	Men			11
Education	Under-graduate			41	Graduate			23
Age	20 - 25	13	26 - 35	24	36 - 45	15	46-above	11
Occupation	Designer			34	Pre-K Teacher			30
Experience	1 - 5 year	21	6 - 10 year	19	11 and above			24

In **Table 1**, the experts who were chosen from designers and Pre-k teachers contributed to the survey, 23 have a graduate degree were 41 have under-graduate degree of these, 21 have 1 - 5 years of professional experience, 19 have 6 - 10 years, and 24 have 11 years or more of professional experience.

**Table 2.** Mental Contributions, play and children development.

Objectives	Children's Mental Development and Play				
	Education		Experience		
	Under-graduate	Graduate	1 - 5 year	6 - 10 year	11 and More
Stimulation	4.71 (0.46)	4.50 (0.76)	4.84 (0.37)	4.58 (0.59)	4.25 (0.79)
Creativity	4.79 (0.50)	4.43 (1.01)	4.73 (0.50)	4.79 (0.50)	4.71 (0.62)
Encouraging	4.05 (0.95)	4.04 (0.85)	3.81 (1.16)	4.07 (0.91)	4.05 (0.95)
Challenging	3.71 (1.22)	4.07 (0.91)	3.73 (1.00)	3.92 (1.01)	3.96 (0.95)

**Continued**

Motivation	4.19 (0.89)	4.25 (0.79)	3.96 (0.95)	4.24 (1.05)	4.19 (0.89)
Imagination	3.64 (1.33)	3.71 (1.22)	3.81 (1.16)	3.38 (1.27)	3.81 (1.16)
Multi-Dimensional	4.07 (0.91)	4.08 (1.09)	4.21 (0.88)	3.96 (0.96)	4.05 (0.95)
Critical Thinking	4.38 (0.82)	4.54 (0.65)	4.24 (1.05)	4.43 (0.85)	4.29 (0.85)
Socialization	4.75 (0.53)	4.71 (0.46)	4.54 (0.58)	4.79 (0.50)	4.83 (0.56)

In **Table 2**, with the Criteria of Stimulation, Creativity, Encouraging, Challenging, Motivation, Imagination, Multi-Purpose, Critical Thinking, Socialization. The design criteria that structure the play benefits; were evaluated. In this section, there was a homogeneous distribution among the participants and the values obtained were high. The mentioned values were found important by both designers and child development experts.

**Table 3.** Functional objectives of play and children development.

Objectives	Function and Play				
	Education		Experience		
	Under-graduate	Graduate	1 - 5 year	6 - 10 year	11 and More
Comfort	3.81 (1.16)	3.64 (1.33)	3.73 (1.00)	3.71 (1.22)	4.71 (0.46)
Aesthetic	4.79 (0.50)	4.43 (1.01)	4.73 (0.50)	4.79 (0.50)	4.79 (0.50)
Warmth	4.05 (0.95)	4.04 (0.85)	3.81 (1.16)	4.08 (1.09)	4.05 (0.95)
Easy Usage	3.71 (1.22)	3.86 (0.94)	3.73 (1.00)	3.96 (0.98)	3.81 (1.16)
Colours	4.19 (0.89)	3.81 (1.16)	3.96 (0.95)	3.52 (0.89)	4.05 (0.95)
Softness	3.64 (1.33)	3.72 (1.20)	3.84 (1.08)	3.91 (1.41)	3.69 (1.28)
Adaptability	4.09 (0.86)	4.11 (0.83)	4.21 (0.78)	4.04 (1.01)	4.07 (0.91)
Luxurious	2.64 (1.32)	2.84 (1.25)	3.14 (1.16)	2.88 (1.23)	2.98 (1.)

In **Table 3**, the functional design criteria that structure the play; Comfort, Aesthetics, Warmth, Easy Usage, Colours, Softness, Adaptability, Luxurious were evaluated. In this section, there was a quite homogeneous distribution among the participants and the values obtained were high except Luxurious which were rated around 2.70 - 3.15. The mentioned values were found important by both designers and child development experts.

In **Table 4**, the Physical design criteria that structure the play; Ergonomics, Size, Hygienic, Healthy, Accessibility, Sensitivity, Flexibility, Security were evaluated. In this section, there was a quite homogeneous distribution among the participants and the values obtained were high. The mentioned values were found important by both designers and child development experts.

**Table 4.** Physical criteria of play and children development.

Objectives	Children Physical Development and Play				
	Education		Experience		
	Under-graduate	Graduate	1 - 5 year	6 - 10 year	11 and More
Ergonomics	4.61 (0.63)	4.33 (0.81)	4.63 (0.64)	4.25 (0.73)	4.21 (0.74)
Size	4.79 (0.50)	4.87 (0.34)	4.73 (0.50)	4.88 (0.43)	4.71 (0.61)
Hygienic	4.84 (0.43)	4.79 (0.50)	4.85 (0.36)	4.93 (0.26)	4.92 (0.38)
Healthy	4.38 (0.82)	4.54 (0.65)	4.38 (0.82)	4.43 (0.85)	4.54 (0.65)
Accessibility	3.76 (1.10)	3.86 (0.94)	4.07 (0.91)	4.08 (1.09)	4.16 (0.85)
Sensitivity	3.64 (1.33)	3.71 (1.22)	3.81 (1.16)	3.96 (0.98)	3.67 (1.20)
Flexibility	3.92 (1.05)	4.08 (1.09)	3.81 (1.16)	4.07 (0.91)	4.19 (0.89)
Security	4.79 (0.50)	4.94 (0.24)	4.88 (0.43)	4.85 (0.36)	4.92 (0.38)

#### 4. Conclusion

The experience is a reflection of the physical content of the play design. The physical content of the experience plays and design is based on the concrete stages. It is important for children to play an active role in the action in terms of children's cognitive skills. Therefore, in order to meet children's developmental needs such as Stimulation, Creativity, Encouraging, Challenging, Motivation, Imagination, Multi-Purpose, Critical Thinking, Socialization, the formation for the differences in the body's movements and postures should be considered by touching on how they think about the act of play they are in in their minds. In addition, stimulating children's perception in many ways makes them intensely active for their cognitive skills.

#### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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