

Affordances of Elementary Schoolyards for Children: An Elementary Schoolyard Design**İlkokul Bahçelerinin Çocuklar İçin Sunduğu Olanaklılıklar: Bir İlkokul Bahçesi Tasarımı****Habibe ACAR¹, Demet Ülkü GÜLPINAR SEKBAN¹****Öz**

Çocuklar eğitim hayatına başladıklarında, gün içindeki zamanlarının önemli bir bölümünü okulda geçirmektedirler. Oyun, çocukların en önemli ilgi alanını oluşturmaktadır. Açık alanlarda oyun oynama çocuklar için son derece önemlidir. İlkokul dönemine karşılık gelen orta çocukluk dönemi (6-10 yaş) çocukların ilgi, merak, keşif, macera duygularının en üst düzeyde olduğu bir dönemdir. Bu dönemde çocukların bu beklentilerini karşılayan açık alanlarda zaman geçirmeye ihtiyaçları vardır. Bu bağlamda ilkokul döneminde çocukların zamanlarının önemli bölümünü geçirdikleri okullarının açık mekanları ve sunduğu fırsatlar oldukça önemlidir.

Bu çalışmada; “çocukların sağlıklı gelişimine katkı sağlaması için ilkokul bahçeleri hangi niteliklere sahip olmalı?” sorusundan yola çıkılmıştır. Bu kapsamda öncelikle çocukların açık alanlardan beklentileri ve açık alanların onların gelişime katkıları konularında literatür araştırması yapılmıştır. Daha sonra genel olarak ilkokul bahçelerinde görülen sorunlar, eksiklikler ve literatür bilgileri değerlendirilmiştir. Sonuç olarak, Trabzon'dan seçilen bir ilkokul için peyzaj tasarımı fikir projesi geliştirilmiştir. Bu sayede çocukların açık alanlardaki beklentilerini karşılayan, hem ders ve öğrenme hem de ders aralarında oyun aktivitelerine imkan sağlayan bir ilkokul bahçesi tasarlamak hedeflenmiştir.

Anahtar Kelimeler: İlkokul, Okul bahçesi tasarımı, Olanaklılık teorisi, Çocuk ve çevre.

Abstract

When children start their education term, they spend significant part of their time in the school. So children's the most important interest is play. Playing in open space is extremely beneficial for children. Also the middle childhood period (6-10 age) that is equivalent to the elementary school period is term in which children's interests, curiosity, discovery, and adventure feeling are at the highest level. Therefore, children need to spend time in open spaces that meet their expectations, in this period. In this context, open spaces of schools where elementary school children spend significant part of their time and the opportunities these areas offer are very important.

This study was initiated by the question that “which qualities should elementary schoolyards should have in order to make a contribution to healthy development of children?” In this context, firstly literature was looked into for children's expectations from open spaces and these spaces' contribution for children's development. Afterwards, in general, problems, deficiencies and literature information in elementary schoolyards have been evaluated. As a result, a landscape design project for an elementary school selected from the city of Trabzon have been developed. Thus, it was aimed to design an elementary schoolyard that can be used as an open class and also allows play activities during breaks and meets the expectations of children.

Keywords: Elementary school, Schoolyard design, Affordance theory, Child and environment.

1. Introduction

When children start their education life, they spend significant part of their time in school. In this term, even so they started their education, it should not be forgotten that they are children. So children's the most important interest is play. Playing in open space is extremely beneficial for children. Also the middle childhood period (6-10 age) that equaled to elementary school's period is term that children's interests, curiosity, discovery, adventure feeling are the highest level. Therefore, children need to spend time in open spaces that meet these expectations, in this period.

In this context open spaces of schools where children who are in elementary school's period spend significant part of their time and opportunities of these areas are very important.

1.1. Importance of Open Spaces for Children

Play is the most important activity for children. The time individuals spent with games during childhood contributes to their healthy development. Especially playing in open areas contributes to discharge excess energy of children, to come together and socialize with their peers, to carry out activities such as polluting and contaminating during play and learning, and to the development of creativity according to opportunities offered by the area (Acar and Gülpınar Sekban, 2017). The physical environment affects the child's behavior, moreover, the behavior is shaped by spaces (Barker, 1968). Researches indicate that environmental experiences help children prepare for life and contribute positively (Acar, 2009). Especially playing in the ages of 6-8 contributes to the child's social, emotional, physical, intelligence and ability development.

Play supports children's perception, motor ability, coordination (Özdemir, 2011) and allows learning, activity, self-expression, realize skills, use creative potential, opportunity, exercise. Play is also child's language and expression tool of self (Acar, 2013). Children tend to play everywhere with their own materials and imaginations. However, it is especially important for them to play, especially in open areas. Because it offers the following opportunities for the child to play in the open spaces; Connect with the environment, Recognize the natural environment, Feel the nature events, Freedom, Discharge excess energy, Pollution and contamination needs, Being together with peers and socializing, Support physical development, Explore opportunities in the environment.

According to White and Stoecklin (1998), children like to see in open spaces; Water; Vegetation in where the trees, bushes, flowers and the long grass; Animals, creatures that

live in ponds; Sand confused with water; Natural color, diversity and change; The seating surface under, in, on, to provide shelter and ghosting places and features; Nook, privacy, and places to which point of view; Especially replaceable structures, materials, and equipments in their dream.

In our study in Trabzon in September 2017 children likes to see in open spaces (Acar and Gülpınar Sekban, 2017); Equipment and material variety; Higher quality playgrounds; Green area / plantation / natural materials; Different activity areas; Clean, regular and soundness spaces; Water-related spaces; Sporting activities; Larger areas; Security; Socialization; Sand; Topography; Animals.

These features children want to see in open areas offer significant opportunities for their plays but most importantly for learning in different areas. Because “Kids don’t need equipments, they need opportunities” (Shell, 2001). At this point, the most important concept is Affordance Theory. Affordance is the most fascinating concept in ecological perceptual psychology (Kyttä, 2003) and the concept was developed by James J. Gibson in late 1970s. Affordance is functional facilities of the environment (Acar and Öztürk, 2017). In other words, according to the affordance theory, environment not by its own elements but by the functional possibilities it offers. For example while tree allows climbing, vegetation allows to hiding (Kirkby, 1989). Therefore, the opportunities offered by the environment indicate the affordances of that environment. Important parts of J. J. Gibson's theory of affordances; “What do the different features of the space provide?” and “What do the different object and space features reminds people?”.

Children perceive these affordances during the movement. These perceived affordances are used or not used according to the needs of the child. In other words, even if children do not use it, there are potential opportunities offered by the community.

1.2. Importance of Schoolyards for Children

Children use open spaces of different qualities in their daily lives. Among them, school gardens have an important place for children. In our country, children spend most of their time at school during the education period (about 8 months per year). This period is further increased in private education institutions. Children spend their subsequent time periods usually at the study centers or at home. That is, their chances of spending time out after school are rather low. Also, it can be said that children do not use open areas outside the school especially during the periods when it starts to get dark earlier.

While the average time spend at school is 1300 hours per year for a student in primary and secondary education in the USA (Brink et al., 2010), in Turkey, approximately 935 hours (Ayaşlıgil and Turan, 2009). This period constitutes approximately 20-25% of the time children spend in school (Cheskey, 1996). In this case, it is extremely important for children to use this important time in school in terms of outdoor use. Therefore, schoolyards should have opportunities to meet children's expectations. School gardens are accepted as places where children's free and natural behaviors are legitimized and encouraged (Sebba and Churchman, 1986). The acceptance of school gardens as places that are intertwined with play leads to the expectation of the benefits of games from school gardens. This shows that school gardens have positive effects on students' social, physical, emotional, cognitive, movement development and creativity (Fjortoft, 2004; Lindholm, 1995; Tandoğan, 2016).

1.3. Landscape Design Approaches at Elementary Schoolyards

“Which affordances should an elementary school garden provide for children?” and “Could we respond to these expectations if we designed an elementary school garden?”. These two questions above have been the starting point of the study. In addition, when we look at the studies related to the subject, it is seen that there are studies about the quality and quantity of schoolyards but there are few studies to produce projects related to these areas. From this point of view, it is thought that this study will make an important contribution to the related field.

Studies on elementary schoolyards have been examined to form the basis for school garden design. According to a research, the activities that students do in the school gardens are determined as follows (Lindholm, 1995); Activities under the supervision of teachers, Team games, Group games, Other dual games, Wandering alone, Role playing.

When we look at what opportunities a school garden should have in terms of space according to Lackney (1994), out-of-school areas that need to be in an elementary school are described as follows; Areas of landscape design, Hard ground areas, Grass play areas, Outdoor classroom, Plant growing area, Outdoor store and play house, Nature and outdoor work area, Car park area.

In Erdönmez's study (2007), the functions of an ideal school garden are as follows; Recreational areas (Break time and ceremony area, Relaxation area), Physical and mental development areas (Sport areas, Play areas), Educational areas (Outdoor classroom, Practice garden (Organic Gardens), Special gardens (Butterfly, bird etc.), Other areas (Car park).

However, when we look at the elementary school gardens in our country, it is seen that there are deficiencies in terms of quality and quantity. It is known that school gardens are not designed by the relevant professional disciplines. According to Regulation on Primary Education Institutions of the Ministry of National Education (Article 90, Play area) in Turkey, "*There should be tools for activities like hanging, climbing, balance and jumping and should be spaces sand pond, volleyball/basketball courts in the school gardens*". In article 91 (application garden), it is stated that "*Agricultural studies and trials are carried out, ornamental plants and trees are planted and law areas are arranged in schools where the garden is suitable*" (Anonymous, 2019). But, these recommendations are very limited in practice. The most important reason these situation is that schools do not have enough open space. This issue should be kept in the foreground especially in urban planning studies.

2. Materials and Methods

"What qualities should elementary schoolyards have to contribute to the healthy development of children?" This question is the starting point of study. In this context was conducted literature review and landscape design project for open area of an elementary school selected from the city of Trabzon has been developed. In this way, it is aimed at designing an elementary school that meets the expectations of children in terms of open areas, which can be used both as open air classrooms and allows play activities between the lessons. At the same time, how the literature information can be evaluated in an existing field is also revealed with a project.

2.1. Landscape Design Project and Design Process for An Elementary School Selected From Trabzon

The study was conducted in the city of Trabzon. The public elementary school gardens have similar deficiencies in Ortahisar district which is the central district of Trabzon. In this context, it was thought that the study could be conducted in any of these schools. So, a landscape design project belonging to Ayfer Karakullukçu Elementary School in Konaklar Quarter of Ortahisar District of Trabzon Province was prepared. The location of the study area in Trabzon is given Figure 1.



Figure 1. Location of the study area in Trabzon

Project work consists of the following stages;

- Problem definition
- Survey
- Analysis and Synthesis
- Preparation of requirement list
- Function scheme and Main decisions of the design
- Final design project

Problem Definition: Identification of problems related to the area at the beginning of the project is important for revealing the objectives of the project. In the project area, which is a primary school garden, the areas of activity that meet children's outdoor needs are not sufficient in terms of quality and quantity. For this reason, there should be options to meet children's expectations from open areas in the direction of school open area facilities. From the point of view of this work, the open areas that children use in this elementary school are not sufficient in terms of quality and quantity (Figure 2).



Figure 2. Pictures from project area

Survey: Survey indicates the current situation of study area (Figure 3).

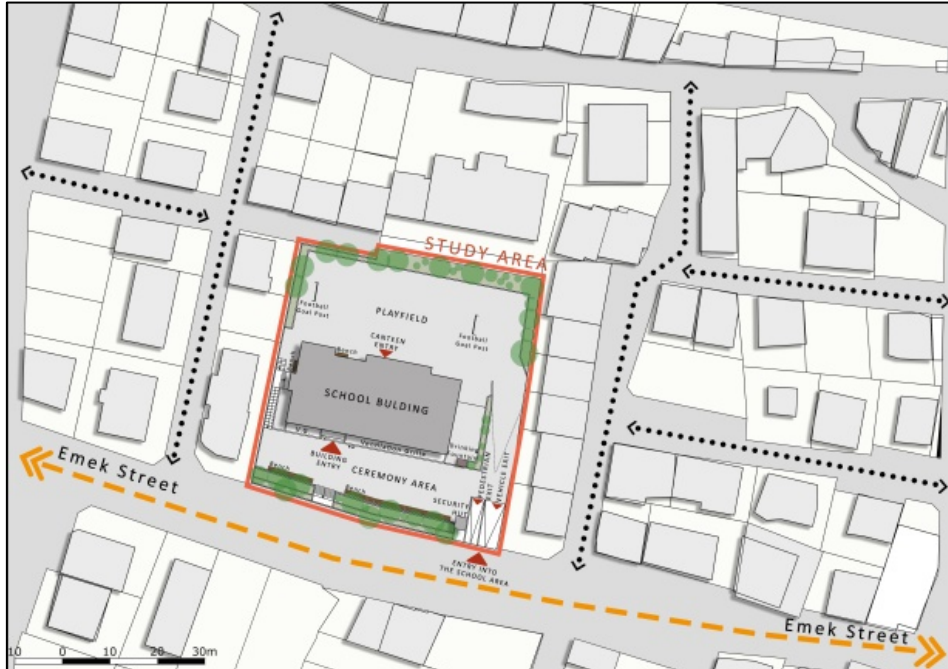


Figure 3. Survey of the study area

Analysis-Synthesis: It is essential to make the necessary determinations by considering the data belonging to the current situation of the area separately. Afterwards, analyzes are synthesized by overlapping and design strategies are determined for the project

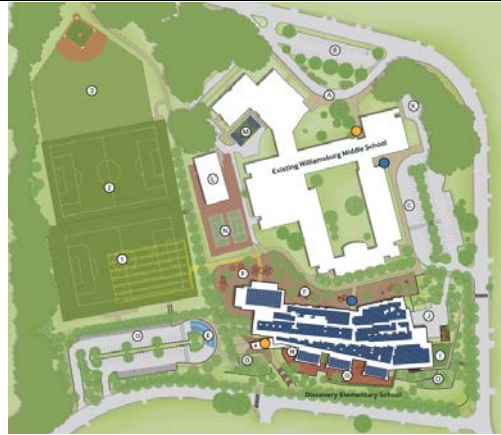



by identifying problems related to the area, opportunities offered to children, how these opportunities can be evaluated in design, user-related data and design approaches to be developed in this direction. The analysis titles and contents covered in this context are given in Table 1.

Table 1. The analysis titles and contents

Structural Analysis	Plant Analysis
Equipment:	<i>Abies nordmanniana</i>
Sitting furniture	<i>Ailanthus altissima</i>
Lighting	<i>Platanus orientalis</i>
Football pitch	<i>Cercis siliquastrum</i>
Trash can	<i>Morus sp.</i>
Fountain	<i>Hibiscus syriacus</i>
Hard/Soft ground:	<i>Nerium oleander</i>
2480 m ² hard ground	<i>Philadelphus coronarius</i>
375 m ² planting area (soft ground)	<i>Spiraea x vanhouttei</i>
620 m ² building area	<i>Euonymus japonica</i>
	<i>Jasminum fruticans</i>
Space Analysis	User Analysis
Ceremony space	Students: 605 people
Football field	Teachers: 27 people
Sitting spaces	Managers: 2 people
Free activity areas	Administrative staff: 5 people
Traffic training area	School bus: 10
Car park	

In this phase, the literature knowledge on the theoretical and project examples related to the subject was also analyzed. In this context, the open areas of different elementary schools are also examined. Among these samples, especially ones which take into account the ecological design principles were evaluated. Some of these elementary schools are Discovery Elementary School (Arlington, ABD), Manassas Park Elementary School (Virginia), Lucie Aubrac School (Toulouse, France), Wilkes Elementary School, Little Cedars Elementary School (Snohomish, Washington) (Table 2).

Table 2. Some schools designed with ecological criteria

Discovery Elementary School (Arlington, ABD)	
Project Attributes (The American Institute of Architects, 2017).	
Year of Design Completion: 2014	Site Area: 59500m ²
The design of the school area is based on two important criteria. These; challenge the tendency of low expectations, and focus on children first. The design criteria aimed to make children enjoy their time at school and to contribute to their learning by attracting the attention of children. In addition, creating sustainable school spaces and raising awareness about climate change are among the main objectives (The American Institute of Architects, 2017).	
	
Manassas Park Elementary School (Virginia)	
Project Attributes (The American Institute of Architects, 2019).	
Year of Design Completion: 2009	Site Area: 13000m ²
School area of the inner space and outer space is designed to be integrated. The study was specifically designed around especially children, cannot be expected to preserve or protect something they do not understand purpose. Especially maintaining sustainable design criteria into consideration. Sustainable spaces have been created where children can accumulate memories while learning. (The American Institute of Architects, 2019).	
	
Lucie Aubrac School (Toulouse, France)	Project Attributes (Archdaily, 2019)
Year of Design Completion: 2012	Site Area: 2425m ²
This school area designed has given importance to afforestation in order to communicate with nature. The project has been shaped according to design decisions that give importance to material and sunshine duration in terms of sustainability.	

	
Wilkes Elementary School (Bainbridge Island, United States)	
Project Attributes (Archdaily, 2015).	
Year of Design Completion: 2012	Site Area: 5990 m ²
There are places that keep learning and play together. Courtyards are designed to make the most of daylight. Children play in the foreground.	
	
Little Cedars Elementary School (Snohomish, Washington)	
Project Attributes (Nac, 2019).	
Year of Design Completion: 2009	
Has a design understanding that attaches importance to naturalness. It aims to create interesting, flexible and intriguing spaces with the external environment. In order to ensure the fresh air intake of children, they have attached importance to air conditioning and air flow. By positioning libraries and classrooms outdoors, they have facilitated children's learning.	
	

In general, schoolyards in private education institutions in Turkey provide opportunities for activities that support the physical, social and academic development of children. However, it is difficult to see examples of good practice in government education institutions in this direction. In fact, in 2011, “Okullar Hayat Olsun” named project was initiated by the Ministry of National Education of the Republic of Turkey. The aim of the project is to open schools for the service of parents, neighborhood residents and the

community, to turn schools into a 'Lifelong Learning Center' for students and adults and 'lively safe areas' that allow for recreational and entertainment activities. The project, which is carried out together with the cooperation of the Ministry of Forestry and Water Affairs of the Turkish Republic and the Union of Turkish Municipalities, has open spaces that are gained to schools, however these are insufficient. In Trabzon, it is also necessary to reconsider the open areas of elementary schools in terms of their contributions to children.

Preparation of Needs List: As a result of the work done so far, a list of needs has been prepared which includes the users of this elementary school, the needs of these users, the activities that meet these needs and the spaces where these activities are to be carried out. While the needs list was being prepared, interviews with the school administrators and the examples regarding the subject were also taken into consideration. According to this information the needs list is prepared in five main headings (Table 3).

Table 3. Needs list of project

Ceremony	Ceremony Demonstration/Performance space
Sport	Football field Basketball court Volleyball court
Education	Outdoor classroom
Lesson	Alphabet garden Music garden Picture garden Reading space Traffic training area Plant growing / Experiment area
Play	Free activity areas Climbing wall Hopscotch play area
Other	Eating-Drinking area Car park

Function Scheme and Main Decisions of the Design: Later a function scheme and main decisions of designs sheet showing the project locations of the spaces in the list of needs and their relations with the other places has been prepared (Figure 4).



Figure 4. Survey of the study area

Final Design Project: The plan and render images of the completed project are given in Figure 5, 6.



Figure 5. The plan of project



Figure 6. Render images of the project

3. Results and Recommendations

As a result of this work, application project has not been prepared. Only a suggestion has been made about how to change an existing elementary schoolyards. Design is a problem that has different solutions according to the creativity of the designer, the approach to the subject and the possibilities of the area. When we remove the designer factor, larger school open areas will provide more opportunities for children. For this, especially in urban planning phase, school open area sizes should be determined considering the importance of the subject. Nevertheless, the elementary school that is being worked on is more fortunate than some schools in Trabzon city center which are surrounded by traffic and buildings in terms of open area usage.

The project put forward in this study has been designed in the direction of school administrators' thoughts about school problems and wishes, children's expectations

according to literature knowledge and the recommendations of the designer. However, since children's behavior in the environment and their perception of the environment are different from adults, it is recommended that children should participate in the design process as much as possible. Elementary schoolyards were considered within the scope of the study. However, there is a need for qualified architectural solutions in schools where children can be in contact with the outside world while in the school. This is because the studies that have been carried out reveal that even watching the natural areas or almost natural areas has a positive contribution to human health and success.

Finally; today, the need for a skill-oriented education system has emerged in the changing exam systems in our country. For this reason, it is very important for children to support these developments from elementary school years.

Acknowledgements

We would like to thanks Muharrem iek who is the Director of Ayfer Karakulluku Elementary School and Hseyin Kanca Assistant Director of Ayfer Karakulluku Elementary School who shared his views about school with us during the project.

This study was presented orally in International Forestry & Environment Symposium (IFES) on 07-10 November 2017 and summary of the study was published in Symposium Abstract Book.

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