

CHILDREN'S PARTICIPATION AND BIOPHILIC DESIGN IN  
PRESCHOOL LEARNING ENVIRONMENTS



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MAY 2019

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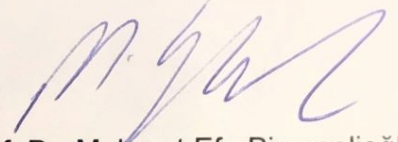
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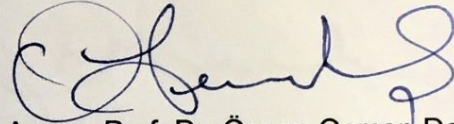
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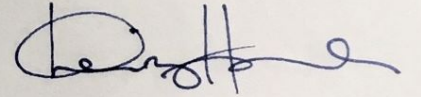
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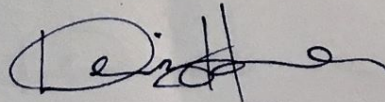


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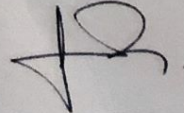
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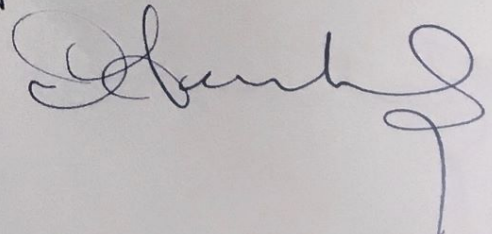
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## ABSTRACT

### CHILDREN'S PARTICIPATION AND BIOPHILIC DESIGN IN PRESCHOOL LEARNING ENVIRONMENTS

Ergüneş Kütük, Gülfem

MDes, Design Studies Master's Program

Supervisor: Prof. Dr. Deniz Hasırcı

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The aim of this study is to create a biophilia-based preschool education class design proposal in participatory design by giving a central role to the design process for children aged 2-6 who are educated in pre-school education institutions. Another aim of the study was to examine the place in recent years in the field of education progressively biophilic design in the world and Turkey, to look at the connection of children with nature and to contribute to the formation of the participatory process in the preschool class model that will be offered a design proposal. From this point of view, a case study of ten children was carried out at Montessori College in Bademler Village in İzmir. In the workshop where ten children participated, observations, interviews and questionnaires were applied. Through to the case study, biophilic participatory approach model is presented considering the opinions of the students who are the center of design with the biophilic participatory approach and the MNE regulations. At the same time, design proposals for preschool learning environments were given in line with the results.

**Keywords:** Participatory design, biophilia design, preschool, learning environments, Montessori, Turkey

## ÖZET

### OKUL ÖNCESİ ÖĞRENME ORTAMLARINDA ÇOCUKLARIN KATILIMI VE BİYOFİLİK TASARIMI

Ergüneş Kütük, Gülfem

Yüksek Lisans, Tasarım Çalışmaları Yüksek Lisans Programı

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Bu çalışmanın amacı okul öncesi eğitim kurumlarında eğitim alan 2-6 yaş grubu çocuklara, tasarım sürecinde merkezi bir rol vererek, katılımcı tasarımda biyofilya merkezli okul öncesi eğitim sınıfı tasarım önerisi oluşturmaktır. Çalışmanın bir diğer amacı ise son yıllarda Dünya'da ve Türkiye'de gittikçe gelişen biyofilik tasarımın eğitim alanlarındaki yerini irdelemek, çocukların doğa ile olan bağlantısına bakmak ve tasarım önerisi sunulacak okul öncesi sınıf modelinde katılımcı sürecin oluşumuna katkı sağlamaktır. Bu düşünceden hareket ile İzmir'de yer alan Bademler Köyü Montessori Koleji'nde on öğrenciden oluşan bir durum çalışması gerçekleştirilmiştir. On çocuğun katılımcı oldukları çalıştayda gözlem, görüşme ve anket uygulaması yapılmıştır. Gerçekleştirilen durum çalışması sayesinde, biyofilik katılımcı yaklaşım ile tasarımın merkezi olan öğrencilerin görüşleri ve MEB yönetmeliği dikkate alınarak biyofilik katılımcı yaklaşım modeli sunulmuştur. Aynı zamanda çıkan sonuçlar doğrultusunda okul öncesi öğrenme ortamlarına yönelik tasarım önerileri verilmiştir.

**Keywords:** Katılımcı tasarım, biyofilik tasarım, okul öncesi, öğrenme ortamları, öğrenme ortamları, Montessori, Türkiye

This work is dedicated to;

**Yard. Doç. Dr. Yalçın ERGÜNEŞ and Nurgün ERGÜNEŞ**

For their precious love of 32 years...

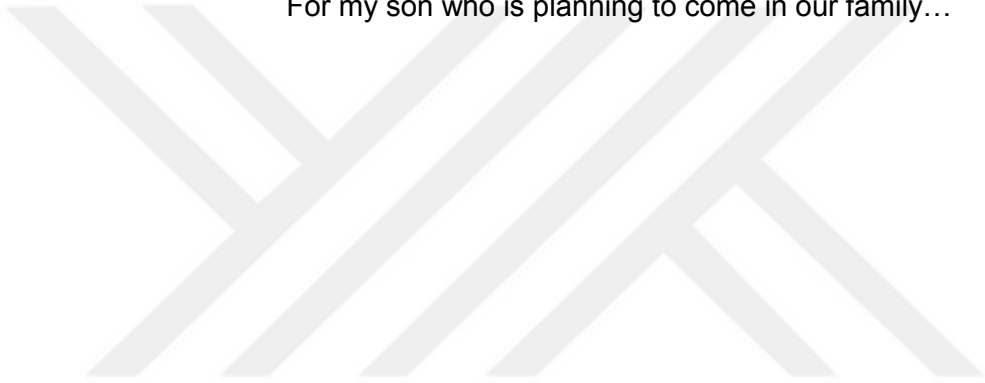
and

**Yiğit Ali KÜTÜK**

For being the meaning of my life and being the dad of my son...

and

For my son who is planning to come in our family...



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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 AIM OF THE STUDY**

The aim of this research is to create design proposals for preschool learning classes, which are proposed by the Ministry of National Education (MNE) in accordance with the contemporary approaches in education, biophilic participatory approaches. Another aim is to create a proposal for a biophilia-based preschool education class design by using participatory design instruments and by giving a central role in the design process to the 5-6 age group children who are educated in pre-school education institutions. In addition, the opinions of teachers and parents who play an active role in this process are considered. Moreover, another objective of the study is to focus on biophilia as a field gaining significance each day, contribute to the development of biophilic design in Turkey, and to examine its place in educational environments. Implications of children's connection with nature is investigated and findings are reflected on the design of a preschool learning environment.

#### **1.2 RESEARCH QUESTIONS AND HYPOTHESIS**

Research Questions (RQ)

RQ1. What is the importance of biophilic participatory approaches regarding the design of preschool learning environments?

RQ2. What possible improvements might a biophilic participatory design model for the design of preschool learning environments suggest?

RQ3. What are the desires and views of childrens concerning the design of preschool learning environments?

RQ4. What reflections improvements can biophilic participatory approaches have on preschool learning environments in Turkey, in accordance with the MNE?

Hypotheses (H)

H1. The views and thoughts of children about the planning of learning environment will create differences in the design of these classes.

H2. Alternative design suggestions can be made in accordance with the psychological and physiological characteristics of the learning classes to be formed by the biophilic participatory approach.

### **1.3 STRUCTURE OF THE THESIS**

This thesis consists of five chapters:

In the first part of the study, the aim, method and justification of the research are explained.

In the second part, child development and early childhood education will be discussed. The perception of child psychology and development in designing preschool children's areas is very important. The way children perceive and learn is quite different from adults. Therefore, it is very important when we think that the cognitive, physical, emotional, kinesthetic and social development of 2-6 age group children will affect the whole life.

In the third chapter, children's learning skills and developmental stages of pre-school education areas in the world with contemporary approaches in education are discussed. It also referred to the importance of pre-school education in Turkey. The contemporary approaches and the class model proposed by the Ministry of National Education (MNE) will be evaluated and evaluated.

In the fourth chapter, attention is drawn to the relationship between biophilic participatory approach and human-nature. Participatory design, participatory design in natural environments, biophilia theory, the impact of biophilic design in pre-school settings and biophilic participatory design proposals are mentioned.

In the last chapter, biophilic participant approach model and design suggestions of learning environments are given based on the wishes and opinions of children.

## **CHAPTER 2**

### **CHILD DEVELOPMENT**

In this chapter, the definition of child development and developmental areas will be discussed. On one hand, general term of a child is defined as a person continuing the stages of development from infancy to puberty; on the other hand, development is a process including some aspects such as physical, cognitive, emotional, social, and adapting skills to life. Infancy period is range from birth to 2 years. Early childhood years refer the ages from 2 to 6 years. Lastly, middle childhood generally is considered as the years from 6 to 12 (Rathus, 2011).

Child development is considered as a subfield of developmental psychology. As an umbrella term of developmental psychology includes a variety of studies related to physical, psychological, and behavioral changes that occur in human life span (Passer & Smith, 2011). There are many motives for studying in the area of child development. Some of these can be listed understanding human nature, examining the origins of adult behaviors, explaining the effects of culture on development, optimizing conditions of development, and gaining insight into the origins and treatment of developmental problems (Rathus, 2011).

The concept of development in linked with early childhood education can be considered as systematic and adaptive changes in the body and mind based on results of growth and maturity (Jackman, 2012). Therefore, it is important to focus on the principle of developmental psychology is that one developmental area have influence on another one. In other words, child development occurs in a holistically way (Jackman, 2012). Main developmental areas can be classified as physical, cognitive, affective, kinesthetic, and social development.

In the context of this thesis, infancy period and early childhood period will be discussed rely on developmental areas which were mentioned above.

## **2.1 Physical Development**

Physical development begins with conception to birth. The germinal stage continues about 2 weeks of period when a sperm fertilizes a female egg. This fertilized egg is defined as a zygote. Through repeated cell division, the embryonic stage begins at 3 weeks. The placenta and umbilical cord develop at this stage. These two important structures enable embryo to develop bodily organs and systems. After 9 weeks from conception until birth, the fetal stage begins. After the period of 27 weeks, the fetus is likely to survive any premature case (Passer & Smith, 2011).

After conception of birth, infancy period begins until the age of 2 years. In this period developmental changes occurs as cephalocaudal and proximodistal development. Which means that developmental changes and from inside of body (central nervous system) to outside of the body (controlling arms and legs). As child grows and matures, differentiation comes with her. That is, child's physical reaction to the world becomes more specific than global (Rathus, 2011).

Early months of infancy are significant in structuring a ground for all developmental areas. Infant who is the child in infancy period tries to explore around the environment with senses like seeing, hearing, tasting, smelling, and feeling. Physical movement, sensory exploration, and social interaction are very important for infants' development. Therefore children need to be exposed a variety of stimulus. With the help of maturation, children learn to control head movements, hand skills, movements of body like rolling over, crawling, sitting, and walking (Rathus, 2011).

In infancy, there are remarkable changes in height and weight. Especially the brain has shown huge improvement about its size until age of 5. Plasticity ability of brain which means brain can repair damage itself is much more about 1 to 2 years of age and gradually reduces. It is important for children to be exposed to various stimulations to improve their neural pathways in the brain. These neural networks enable children to accomplish functions of developmental areas (Rathus, 2011). However, this rapid growth process slow down during early childhood period.

The development of gross motor skills which indicate large muscles movement (locomotion) displays enormous improvement in early childhood period. They can

stand up one foot, walk up stairs, ride bicycle, grab a small ball, jump, run and climb. Children often learn motor abilities by teaching themselves and observing the behaviors of other children. Consequently, children at this stage tend to play more physically oriented play such as rough-and-tumble play which consists of running, chasing, and wrestling (Rathus, 2011).

Fine motor skills which involve small muscles used in manipulation and coordination develop eventually behind gross motor skills. Children can hold a pencil, dress themselves, and use blocks based on a pattern thanks to control over their hands and especially fingers (Rathus, 2011). In this period, parents should allow children to do practice about situation which I mentioned above. Child drawings show improvements from scribbling to recognizable pictures with the help of fine motor skills and cognitive abilities.

## **2.2 Cognitive Development**

Cognitive development focuses on the changes of children's brain structures and functions. Cognitive process consists of all type of mental activity involving gaining, understanding and modifying information (Bjorklund, 2012). The focus of cognitive theories is related to how children are configuring their perception of themselves and the world (Schunk, 2008). One of the most important cognitive theories belongs to Jean Piaget.

According to Piaget, learning actualizes active exploration and discovery in physical and social environment. Children use assimilation and accommodation getting new information about the world. Moreover, children are born with schemata which mental structures are providing gain or organization of knowledge (Rathus, 2011). Assimilation means to interpret new concepts with the help of existing schemata. That is, children use existing cognitive structure to get new information (Schunk, 2008). Accommodation is to change existing schemata in order to understand new information. Children change existing cognitive structure with their experiences (Jackman, 2012). Piaget also mentioned about equilibrium which means the balance between assimilation and accommodation. Equilibrium is kind of biological instinct to make a balance cognitive structures and environment (Schunk, 2008).

Jean Piaget divided cognitive theory into 4 stages which is sensorimotor stage (birth to about 2 years), Preoperational stage (about 2 to 7 years), concrete operations stage (about 7 to 12 years), and formal operations stage (12 years

through adulthood) (Schunk, 2008). In the context of this thesis, first two stages of Piaget's cognitive theory which are sensorimotor and preoperational will be discussed.

Sensorimotor stage is defined rely on how children perceive the world during infancy period. At this stage, child's attempts to understand her surrounding rely on physical movement and sensory exploration (Schunk, 2008). First of all, infant begins to learn with the help of her reflexes and senses. In time, these reflexes and senses become behaviors. Babies enjoy repeating behaviors and then repetition makes children discovery new behaviors (Jackman, 2012). During this stage, infants display goal-oriented behaviors and mental representation of objects (object permanence). Babies try to solve problem mental trial and error method.

Preoperational stage begins at about age 2 in which, they perceive the world through symbols like words and images but they are not fully capable of understanding basic mental operation and rules. This stage is characterized by symbolic thinking which means that objects from outside world have mental representation in child's mind. This ability allows children to solve problems by thinking before acting (Jackman, 2012). Children can use words for objects and keep objects' images in their mind. Therefore, they can distinguish simple concepts like differences or similarity (Passer & Smith, 2011).

Egocentrism is a notable trait in preoperational stage that children think about the world only in a relation with themselves. They have a difficulty perceiving the world from other's aspects. In other words, they believe that other people experience this world in the same way they do (Passer & Smith, 2011). This way of perception inclines children to make wrong relation between cause and effect. Children believe that everything happened with a reason therefore they display precausal thinking like animism, artificialism, and transductive reasoning that is reasoning from the specific to the specific (Rathus, 2011).

The preoperational child cannot understand conservation. The principle of conservation is that basic characteristics of objects such as volume, number and mass are conserved even if their appearance is changed. For example, 4 years old children think that there is more water in taller glass even if the short one has the same amount water. Centration which means the ability to focus on one dimension is specific trait of preoperational children. Another reason why children

show conservation is also irreversibility. That is, it is difficult for children to reverse an action mentally (Passer & Smith, 2011).

During preoperational stage, rapid language development provides children to improve their vocabulary capacity. Children have difficulties to think that one class consists of several subclasses. Class inclusion is a result of centration (Rathus, 2011). Although there are 5 dogs and 3 cats in a picture, children tend to think that there are more dogs than whole animals. Cognitive difficulties of preoperational child gradually decrease at the end of the stage.

### **2.3 Affective Development**

Infants' emotional reactions can be understood with the help of their facial expressions, vocalization and other behaviors provide a channel to their unique emotional world (Passer & Smith, 2011). For example, crying is expression of stress and staring at objects is expression of interest. Almost 18 months of age, babies develop a sense of self which means they can recognize themselves in a mirror (Passer & Smith, 2011). Gradually, stress divided into separated emotions like anger, fear, and sadness. At this stage, conversation about how children feel about various situations is important for children to understand their emotions at early ages (Shaffer, 2009). As emotional reactions become more complicated with age, emotion regulation grows into important for children. Emotional regulation means the ability of revising and regulating emotional reactions. For example, babies suck a pacifier to relief themselves.

Attachment is one of the most important issues in the social and personality development in infancy. This term can be defined as a strong emotional bond between infant and their primary caregiver in which this is a mutual relationship (Shaffer, 2009). As infant's needs are met like feeding, loving, cleaning and social interaction, child becomes more attached her primary caregiver. This secure attachment enable infant to feel comfort, to explore environment, and to build main structure for all type of developmental areas. In early months, infants try to interpret and differentiate parent's emotion in order to understand the relationship emotions and ambiguous situation. This ability is called as social referencing. The parent's ability to express their emotions and responsiveness to emotional reaction is very important for children to develop basic emotional patterns about social interaction (Shaffer, 2009).



In early childhood period, children become more awareness about themselves. Thanks to maturation of memory and symbolic thinking, children can differentiate their characteristics like age and sex from others (Shaffer, 2009). Children tend to define themselves based on their loved actions, their physical characteristics, their properties and their choices. Psychological definitions like friendly and helpful are not used by children at this period (Shaffer, 2009).

Children's ability of self-conscious enables them to experience some socially constructed emotions like embarrassment, pride and shame. Their emotional expressiveness and skills to regulate emotions provide children with gaining emotional competence (Passer & Smith, 2011). At his stage, children more often talk about their feelings and desires. About age of 3, children's behaviors are determined by their desires. They think that behaviors of others are reflection of their desire instead of their beliefs (Shaffer, 2009). 4 to 5 years old children begin to understand that beliefs are mental interpretation for reality and that people's actions are affected by both beliefs and desires even if these actions are inaccurate. It is important for children to develop this belief-desire theory for all later social cognitive development (Shaffer, 2009).

#### **2.4 Kinesthetic Development**

The sense of kinesthesia provides people with awareness about their muscles and physical capacity (Passer & Smith, 2011). With the help of developing kinesthesia, children can learn the basic abilities for coordinated body movement (Passer & Smith, 2011). Developmental appropriate exercises at any age should be used for children to improve their capacity of manipulative movement skills. Consequently, the ability to use the body for expressing ourselves is improved by gaining information about muscles, sensation, reflexes, coordination and movement (Jackman, 2012).

Howard Gardner's multiple intelligence theory defines bodily-kinesthetic intelligence as the ability to combine the body and mind in physical activity. The learning environment should be simulative and challenging for children's physical activities. Moreover children with kinesthetic intelligence are sensitive tactile experiences. Teacher should consider the fact that children with kinesthetic abilities learn by moving, doing, and touching. They are in need of being active like at hand-eye coordination activities and at hands-on activities (Jackman, 2012).

## **2.5 Social Development**

Psychologist Erik Erikson claims that personality of human develops encountering a series of psychological stages. Each stage include a different conflict about how perceive ourselves in relation to other people and the world. Four of these life crises take place in infancy and childhood which are basic trust versus basic mistrust (first year), autonomy versus shame and doubt (about 1-2 years), initiative versus guilt (about 3-5 years), industry versus inferiority(about 6-12 years) (Passer & Smith, 2011).

In the first year of life, the developmental role of infant must to trust the main caregiver and the environment. This crisis is formed based on the fact that infants are able to trust their caregiver to provide food, relive discomfort, display warmth and affection (Shaffer, 2009). It is important for infant to feel comfort, satisfied, and contentment with environment (Rathus, 2011). About 1 to 3 years, children's developmental task is to gain individuality. Children have desire to make choices and gain self-control like feeding and dressing themselves Parents need to be more permissive for children to actualize their choices (Shaffer, 2009).

From age 3 until age 5, children desire to accomplish independence from their parents. They take initiatives and actions about trying new things and testing themselves (Rathus, 2011). Important role of parents is to establish a balance between child's sense of initiative and learning respect for other's space. In some cases, child's activities may lead conflict with other family members (Shaffer, 2009). About 6 to 12 years, the developmental task is to become master social and academic skills. If children are enough industrious, they will get social and academic skills to feel self-confident (Shaffer, 2009). All of life crisis need to be solved for healthy psychological adjustment when confronting them.

### **2.5.1 Family Relations**

Erik Erikson mentioned about two dimensions of parenting which is highly important during childhood and adolescence. These are parental acceptance/responsiveness and parental demanding/control (Shaffer, 2009). Acceptance and responsiveness are related to how much parents display their support and affections to their children. Furthermore, parental warmth and sensitivity are crucial for infants to establish secure attachment between family

and child. These parents generally try to maintain child's curiosity which is increasing child's desires to explore, sociability and cognitive development by smiling at, praising and encouraging their children. Children of these parents do not feel any sense of rejections and fear to make any mistake because they know that when their parents criticise them about misbehaviors, parents show a great affection and reasonable attitude towards their children (Shaffer, 2009).

Another dimension which is demandingness/control means that how much control or supervision is used by parents about children's behaviors. More controlling parents are concern about their rules and demanding which have impact on children's freedom to express and personal spaces. Less controlling parents give their children more space to follow their interests and make decisions about their own actions (Shaffer, 2009). In the early childhood period, as child gain her autonomy, parents might be more controlling and demanding about her behaviors. However this kind of attitudes cause a loss for child about improving concept of social and personality development. It is important fact that warm and responsive parenting is always related to positive outcomes like secure attachment, social adjustment, and a strong sense of morality in children's lives (Shaffer, 2009).

### **2.5.2 School Relations**

School is one of the most influential environments in child's life as well as family. Children begin to formal education including basic academic skills and knowledge. Moreover school has another role to get information about culture. These cultural concepts are related to being good citizens, obey rules, collaborating with classmates, and respect the authority. School has a variety of dimensions like physical environment, content of curriculum, attitudes of teachers, student involvement, peers relations, and parent involvement. These dimensions define the effectiveness of school and the qualification of child's school experiences (Shaffer, 2009).

A good school should provide children with developmentally appropriate abilities related to academic achievement, social skills, positive attitude toward learning beyond ages, and competence about obtaining a job (Shaffer, 2009). It is important for children to feel secure and gratified about teacher's positive attitude. If children feel more secure and comfort in school, they are more likely to become academically successful and regulate their emotional changes.

The relationship parent and teacher in school are important for children's development. Parent involvement in school process enables children to improve sense of self esteem to specialize academic skills. Teacher's authoritative instruction which means a warm and concerned but controlling style makes children become more motivated about learning. Another important function of school is peer relations. As child's cognitive and social abilities develop, children's desire to engage with other in social interaction will become more notable (Shaffer, 2009).

Mildred Parten claims that there are 6 categories of play among preschool children 3 of them called as nonsocial play which means that children do not interact socially. Furthermore, social play consists of 3 categories which are parallel play, associative play and cooperative play. Children play with the same toy in a different way in parallel play. This is the early stage of peer interaction but object (toy) is still center of motivation. Secondly, associative play is beginning of peer interaction. Although children seem like play together, they keep their individual motive in the group. Lastly, cooperative play is established by a group of children depend on group's goals. Each child has a role and mutual motive in group oriented play (Jackman, 2012). In these kinds of play, children are influenced by other children like they play. A variety of social skills which are sharing, helping, taking turns, and dealing with social conflicts are experienced and learned by children in the context of social play (Rathus, 2011).

## **CHAPTER 3**

### **PRESCHOOL LEARNING CLASS THEORY AND CONTEMPORARY APPROACHES**

#### **3.1 Definition and Importance of Preschool Education**

The preschool age between 2-6 years of age, known as the first childhood years of learning, is a process in which children develop significantly in terms of physical, cognitive, emotional and social aspects (Yapıcı ve Ulu, 2010). In this period, the concept of pre-school education has emerged in order for children to develop as a qualified person in all areas of development and to be supported in the right direction and to gain basic skills that will guide their future lives. According to Eliason and Jenkins (2003), it is important for a qualified education to be given in preschool period to shape the life of the child.

The preschool period covers the period from the birth of the child to the age of 6 and many definitions are made about this period. All kinds of systematic, organized and planned educational activities aiming to ensure the development of children between 0-6 are called pre-school education (Kuru-Turaşlı, 2008: 2). Pre-school education; starting from the birth of the child, to the beginning of primary school is of vital importance in the future life. In this period, physical, psychomotor, social-emotional, cognitive, language development, and self-care skills are completed to a great extent, continued with the cooperation of family and institution, a process in which the personality is also defined (Akduman, 2010).

Pre-school education in the broadest sense;

- During the period from birth to 6 years of age,
- To support the child's cognitive, language, social-emotional, physical development areas,
- In accordance with developmental characteristics and individual differences,
- It aims to explore, develop and use its existing potential,

- Providing the social-emotional and mental competences required by the primary school,
- It allows the child to recognize, adopt and adapt to the cultural values of the society where,
- Offering a convenient environment with rich stimulus for all these,
- It can be defined as a systematic and planned training process in a preschool education institution, in which family or alternative programs are given (Kuru-Turaşlı, 2008).

### **3.2 Objectives of Preschool Education**

Before looking at the aims of pre-school education, it is necessary to know the general aims of the Turkish National Education. Because, the general objectives of pre-school education are determined in line with the general objectives of Turkish National Education (Akduman, 2010).

The general objectives of the Turkish National Education are all members of the Turkish nation;

1. The aim of Atatürk revolution is to raise citizens who are dependent on the principles of Atatürk nationalism, who adopt their cultural values and who are aware of their responsibilities to their country.
2. Body, mind, morality, soul and emotions developed in a balanced and healthy way to a personality and character, free and scientific thinking power, a wide world view, respecting human rights, value the personality and enterprise, who are responsible for the community; train as constructive, creative and productive people,
3. Developing their interests, skills and abilities to prepare them for life by providing them with the necessary knowledge, skills, behaviors and the habit of working together and to enable them to have a profession that will make them happy and contribute to the happiness of the society.

Thus, on the one hand to increase the prosperity and happiness of Turkish citizens and Turkish society; on the other hand, to support and accelerate economic, social and cultural development in national unity and integrity, and finally to make the Turkish Nation a constructive, creative, elite partner of contemporary civilization (MEB, 2015).

The objectives and duties of pre-school education, in accordance with the General Objectives and Basic Principles of Turkish National Education;

1. To ensure that children acquire body, mind and emotion development and good habits,
2. Preparing them for primary school,
3. Creating a common development environment for children from conditions of unfavorable environments and families,
4. To provide children to speak Turkish correctly and beautifully (MEB 2015).

As stated above, the primary aims of preschool education in our country are to support the development of children in all aspects, to make them ready for primary school, to minimize the inequalities of opportunities that exist among children and to ensure that children use the language of their country correctly (Kuru-Turaşlı, 2008). Apart from these, OMEP (World Organization for Early Childhood Education), a non-governmental organization working for children since 1948, has universal objectives;

**Social objectives:**

- To look after the children of working women,
- To provide education to each child and to contribute to their individual development,
- To make important contributions to the socialization and relationship of children with each other and with others,

**1. Educational purposes:**

- To educate the child's sense organs and to increase the sensitivity of the child to the environment,

**2. Developing purposes:**

- Based on the child's natural development, controlling his own body, making his own self-control independently, providing the development of basic skills such as speaking, learning, language skills (Akt. Kuru-Turaşlı, 2008; Akduman, 2010; Biber, 2010).

Supporting all areas of development of preschool children is considered to be the main goal of education given in this period. For this reason, children's cognitive, social and emotional, physical development to support and facilitate the transition to primary school can be counted among the general aims of pre-school education (Biber, 2010).

Both national and universal goals clearly show the importance of the pre-school period, which can be called the most precious phase of human life, and the education to be given by both the institution and the family in this period. All these indicators reveal how important and necessary pre-school education is.

### **3.3 Basic Principles of Preschool Education**

In the preschool period, there is a need for the child to be met correctly in order to reach the later periods as healthy individuals (Tokuç, 2007). In this period, the learning speed is high and the learning is the basis for later experiences. Although the developmental characteristics of each age are unique to that age group, each child is unique (MEB, 2013). Certain principles need to be taken into account in order to achieve the objectives of pre-school education and to have a healthy education (Biber, 2012). In 2013, the Ministry of National Education based its program on preschool education with some basic principles. These principles are:

- Pre-school education should be appropriate to the needs and individual differences of the child.
- Pre-school education should support the motor, social and emotional, language and cognitive development of the child, provide self-care skills and prepare it for primary school.
- In order to meet the needs of children in preschool education institutions, learning environments suitable for democratic education should be prepared.
- While organizing events, children's interests and needs should be taken into consideration as well as the facilities of the environment and the school.
- During the training process, the child should start from what he / she knows and be allowed to learn by experiment.
- Children should be given the right attention to Turkish language.
- Pre-school education and the emotions and behaviors of children such as love, respect, cooperation, responsibility, tolerance, cooperation, solidarity and sharing should be developed.
- Education, ensuring that the child feels self-esteem and trust and self-control.



- The game is the most appropriate learning method for children in this age group. All activities should be organized based on games.
  - In communication with children, they should not be treated as deforming, they should not be subject to pressure and restrictions.
  - Children should be encouraged to develop independent behaviors; adult support, guidance, and adult reassurance should be provided when they need help.
  - Children should be encouraged to recognize the emotions of themselves and others.
  - Children's imagination, creative and critical thinking skills, communicating and communicating their emotions should be developed.
  - When preparing programs, the characteristics of the family and the environment should be considered.
  - Effective participation of the child and the family in the education process should be ensured.
  - Pre-school education and guidance services should be integrated.
  - The child's development and preschool education program should be evaluated regularly.
- Evaluation results should be used effectively to develop children, teachers and programs.

In this critical period, which we call preschool from birth to primary school, the learning speed of children is high. The general developmental characteristics of an age group are valid for the other children in that age group. But each child should have his / her own characteristics and individual differences (Tokuç, 2007).

Pre-school education is a critical process that affects the child's future life in terms of forming the basis of the child's cognitive skills in the following years, providing the child with a positive personality, providing a correct attitude towards life, and forming habits, beliefs and value judgments. At the same time, it should be ensured that parents are included in the education given to the child and that education should be maintained consistently (Biber, 2012). For this reason, it is very important to adopt the principles of pre-school education and to give education to children who benefit from pre-school education in line with these principles.

### **3.4 Preschool Education in the World**

Child development and education have been among the topics of interest to adults since the history of mankind. Considering that the importance given to the education of the child is reflected in all areas of the society, this effort is not empty. Countries, institutions and families are aiming to raise individuals in accordance with their policies, cultures and perspectives. The expectations of countries, institutions and families are effective in achieving these goals. Although early childhood care and education services, which gained rapid progress along with industrialization, took different forms and forms depending on changing socio-economic and political factors in different countries of the world, it has achieved a significant place in many countries today (Alat, 2014).

In the United States, the age of compulsory school age varies between five and eight years. Early childhood education and care starts from birth and lasts until the age of eight. The terms used in US early childhood education differ. There are many types of kindergarten, preschool, pre-kindergarten, compensatory education program, nursery school, child care centers / day-care centers, family child care / family day care (Erden, 2012). The US is also implementing the Head Start Program to reduce poverty impacts and increase academic achievement for children of low-socio-economic or immigrant families.

Pre-primary education in the UK is mostly left to local education authorities and independent institutions. Children aged 3-5 years attend an independent kindergarten or a kindergarten. For younger children, the training provided is mostly provided by private, voluntary or independent individuals. Participation in education is not mandatory but optional (Yoleri, 2012). Pre-primary education in the UK is mostly supported by local authorities. However, the United Kingdom Education Act 2002 showed that children aged 3-5 years attached great importance to pre-school education within the scope of studies aimed at early learning (Erden, 2012).

Early childhood education and care policies in Australia are based on high quality, accessible, low cost and availability. Pre-school education is given within the framework of the Early Age Learning Program. Within the framework of this program, the learning of children between 0-5 years of age is supported and enriched and their transition to school is facilitated. Although participation is high

due to support for pre-school education, the participation rate in some regions where natives live, declines (Kurt, 2014).

### **3.5 Preschool Education in Turkey**

Pre-school education in Turkey can be given in the learning environments opened by the various institutions. Pre-primary education institutions are most commonly employed by the Ministry of National Education (MNE) and the Social Services Child Protection Agency (SSCPA). There are also learning environments affiliated to the ministries of health, labor and social security and universities (Büte ve Balcı, 2010). In Turkey, there are various institutions providing care and education services for children aged 0-6. These institutions; independent kindergartens, kindergartens, practice classes, summer school classes, private kindergartens, day care centers and mobile / mobile preschools.

**Independent Kindergartens:** Learning environments affiliated to the Ministry of National Education (MNE) aiming at the education of 36-72 months old children.

**Kindergarten:** Primary schools, secondary schools and physical conditions are suitable for institutions that provide education to children under 48-66 months (Özen, 2008).

**Application Class:** It is the classes opened in the education-training institution which implements preschool education program affiliated to the Ministry of National Education for the purpose of education of 36-72 months old children. (Erden, 2012b).

**Summer School Classes:** In cases where there is a demand and appropriate conditions, the preschool classes are opened to give education to preschool children in line with the preschool education program, not to exceed two months, in summer months, 60-72 months old children (Deterarla-Gül, 2014).

**Private Preschool / Day Nursery and Day Care Homes:** Institutions aiming at healthy growth and education of children in this age group between 0-6 years old who are opened to Ministry of National Education or Social Services Child Protection Agency (Özen, 2008).

**Mobile / Mobile Bus Kindergartens:** Kindergartens open to pre-school education and to support the development of children who cannot attend pre-school education by reaching 36-72 months old children and their families in the regions where families with insufficient financial resources live (Erden, 2012b; Deterarla-Gül, 2014).

Pre-school educational institutions in Turkey can be opened by various organizations. Pre-primary education institutions are most commonly employed by the Ministry of National Education (MNE) and the Social Services Child Protection Agency (Büte ve Balcı, 2010). Independent preschools are pre-primary education institutions affiliated to the Ministry of National Education. Due to the fact that they are not connected to any school, building structures differ according to other learning environments. This difference imposes different responsibilities on school principals, supervisors and teachers. Nearly all of the primary school administrators who are responsible for their kindergarten are those who have received education outside the preschool education area. A similar situation applies to the audit process.

### **3.5.1 Objectives and Development of Preschool Education in Turkey**

The pre-school period, which covers the period between 0 and 6 years, covers a critical period in which children are laid. Developments in this period are very important in terms of shaping the child's next life and being ready for the next life (Akduman, 2010). Children who have a chance to benefit from pre-school education are considered to be more advanced in their future lives than their peers who cannot benefit from pre-school education in many areas such as academic achievement and social skills.

The primary objectives of pre-school education are to support children's development in all aspects, to make them ready for primary school, to minimize the inequalities of opportunities that exist among children, and to ensure that children use the language of their country correctly (Kuru-Turaşlı, 2008). Supporting all areas of development of preschool children is considered to be the main goal of education given in this period. For this reason, children's cognitive, social and emotional, physical development to support and facilitate the transition to primary school can be counted among the general aims of pre-school education (Biber, 2010).

The development of pre-school education in Turkey has followed a slow but steady process. In 1923, the first legal regulation in the Republican period, 'Regulation on the Operation of Pregnant Women and Breastfeeding Mothers' was enacted. It is known that there are 5,580 children and 136 teachers at 80 preschools at the time the Republic was announced. In the 1927-1928 academic year, the Main Teacher School was opened in Ankara for two years. This school, which was active until 1930-1931, was closed due to the shifting of the budget to

primary schools. important developments related to preschool education in Turkey is slow in terms of corporate training and attract attention after 1960, though, it appears that the gradual start of major move. Pre-primary education institutions have been defined in the "Primary Education Law No.222/1961 "as an optional primary education institution to educate children who have not arrived at compulsory primary education. After this law, studies on pre-school education were accelerated. In 1992, 'Preschool Education General Directorate' was established as a new unit under the Central Organization with the Law No. 3797 (Deretarla-Gül, 2008; Deterarla-Gül, 2014; Gülaçtı, 2012).

### **3.5.2 MNE's Preschool Education Policies in Turkey**

Training programs implemented in the preschool education institutions in Turkey teachers from time to time with feedback from experts revised and re-revised. In our country, a program was prepared in 1952 about pre-school education but in this program, the aims for the acquisition of children were not determined. Then a program was prepared in 1989, and the programs were developed in 1994, 2002, 2006 and finally in 2013. The program, prepared in 1989, was abolished in 1994 because it was aimed at the education of the children of the 4-5 age group, it was subject-based and it kept the children's developmental features in the background. In 1994, a new child-centered program was organized. This program is organized as 0-3 Age Nursery Program, 3-6 Age Kindergarten Program and 6-7 Age Kindergarten Program. 1994 program, Nursery program; The characteristics of children between 0-36 months of age, cognitive, language, social-emotional, self-care and physical development were taken into consideration and they were arranged according to three different development stages: 0-12 months, 13-24 months and 25-36 months. The 1994 kindergarten program was designed to support and accelerate the development of children between 37 and 60 months of age in all areas and to provide a basis for the education program for children aged 61-72 months. It also features a guiding program for teachers. However, as a result of the researches and feedback received, it was observed that teachers gave more importance to teaching subjects. Since the goals and the behaviors that need to be gained remain in the background, program development studies have started. During the development work, the nursery program was left intact. Kindergarten and preschool program has been reorganized as 36-72 Monthly Children's Education Program (Düşek & Dönmez, 2012).

In the 2002 Preschool Education Program, the developmental characteristics of children between 36-60 months and 60-72 months in terms of psychomotor field, social-emotional field, cognitive area and language development area were given. When we look at the general characteristics of the 2006 Pre-school Education Program; many theories and opinions are gathered in a common denominator for the benefit of children. It is a program that takes students to the center. It is seen that there is a modern program that aims to create activities in line with the aims and achievements. The program development studies were conducted by taking into consideration the national and international researches, the feedback from the practices and the current situation analyzes within the scope of the Project on Strengthening the Preschool Education Project (Gelişli & Yazıcı, 2012).

Looking at the 2013 Preschool Education Program, children who attend preschool education institutions have a healthy growth through rich learning experiences; It has been developed in order to achieve the highest level of development in the areas of motor, social and emotional, language and cognitive development, to gain self-care skills and to be ready for primary school. In addition to supporting children's development, the program is a multi-faceted program with supportive and preventive dimensions, as it aims to prevent inadequacies in all areas of development. The program is a 'developmental' program based on children's developmental levels and characteristics and in this sense, based on the development of all areas of development. This program, which has a 'spiral' feature as an approach, is 'eclectic' as a model. Learning centers are important. The child develops better in environments where he can freely experience and move freely, and better demonstrate his skills. For this reason, teachers are expected to consider learning environments as interior and exterior spaces as a whole (MEB, 2013).

### **3.5.3 MNE Regulation on the Formation of Pre School Education Environments**

Ministry of National Education Department of Construction and Real Estate Department published in 2015 'Educational Structures Minimum Design Standards Guidance' for kindergarten buildings; Ground +1 (4 classrooms, 80 children), Cellar, Ground + 1 (6 classrooms, 120 children), Ground + 1 (8 classrooms, 160 children) type projects have been proposed. According to this manual, European Conformity (CE) marking is required for all materials in

kindergarten, indicating that the material meets basic quality and safety standards. At the same time, it is emphasized that the construction materials used should be Electronic Stability Program (ESP) certified as proof that they do not harm the environment and International Organization for Standardization (TS-EN-ISO) 14001 certified products should be preferred. This manual also covers a number of standards relating to the general physical characteristics of the class (area, location, doors, windows, floors, ceiling, daylight, ventilation) (MEB, 2015b).

Class space should be planned to be 2.40m<sup>2</sup> per person. Doors should be made of unbreakable tempered or stranded glass, window opening to minimize the risk of accidents and even scans the space and the opening should be designed to protect children from bumps. Coverings A class of healthy, friction and impact resistant, low maintenance, must be covered with building materials. Sound insulation must be taken into consideration in the walls and water based paints should be used. The class should benefit from daylight as much as possible and, if possible, open a door to the garden (Ertürk & Kara, 2018).

#### **3.5.4 MNE Model Proposal for Preschool Education Environments**

The MNE 2013 establishes environment learning centers in the classroom environment. Learning centers are 'the playgrounds that are separated by materials such as lockers, boards, different colored carpets, floor coverings or tapes pasted on the floor, which contain different materials selected in accordance with the achievements and indicators discussed in the daily training plan flow' (MEB, 2013). In MNE (2013) Preschool Education Program, two examples of learning center were presented to teachers in order to effectively organize and use the classes.



**Figure 3.1** MNE general directorate of primary education preschool education program

1. Block Center
2. Dramatic Play Center
3. Art Center
4. Book Center
5. Science Center
6. Sand and Water Table
7. Music Center
8. Entrance and Waiting Area

The above drawing reflects a preschool education environment proposed by the Ministry of National Education where many centers can be placed. In classrooms where space is smaller, not all learning centers may be included. In such a situation, existing learning centers can be used for more than one purpose. For example, the art center can also be used as the center of science, while the dramatic play center can also be used as a block center (MEB, 2013).





**Figure 3.2** MNE general directorate of primary education preschool education program

1. Entrance-Hallway / Block Center
2. Dramatic Play Center

According to the MNE (2013), there are some points to be considered in the creation of these environments: 'Learning centers should be clearly separated from each other. The aim is to enable children to work more effectively in small groups in each learning center. Although the learning centers are separated from each other, they are not separated and independent. While working in a learning center, children can easily follow what is happening in others. Access from one learning center to another is quite easy. Learning centers are separated by child shelving cabinets with open shelf system. It is important for the child to have access to the material he wants to work on his own and to remove the material on his own once he has finished. In order to prevent possible collisions and injuries, the edges of the tables and chairs should be oval, not pointed (MEB, 2013).

#### 3.5.4.1 Learning Centers

Learning centers; 'daily education prepared by the teacher, and the appropriate materials to be used in accordance with the flow and the indicators selected from each other, cabinet, board, carpet and so on. playgrounds separated by materials' (Özkubat, 2013). As most of the children attend the pre-school period, they spend most of their time in classroom settings and mostly in learning

centers. When the interior features of the classroom environment are considered, it is expected that the classroom will be organized in a way that will enable children to be active in the learning process, to develop creativity, problem solving, independent movement and self-regulation skills (Ertürk-Kara, 2018).

Learning environments reflect the philosophy of the educational program. Early childhood care and education is one of the most important factors that directly affect the quality of its services. Learning environments have two sub-units. One of them is physical environment and the other is social emotional environment. The importance of the physical environment on all areas of development, skills and creativity of the child is also indicated by the studies. It is important that a preschool education institution is designed to meet the educational needs of children. Well-designed learning environments support children's effective learning and develop creative problem-solving skills. Careful and carefully planned learning environments are important for the success of training programs. In order to be able to plan and implement this training program in accordance with its purpose, learning environments should be arranged to include learning centers (MEB, 2013).

Teachers are expected to make arrangements for individual needs and interests of children by taking into account the physical characteristics of the class and the number of children in the learning centers (Aysu ve Aral, 2016). The number of children in a class determines the number of children in the classroom and the physical conditions of the class. The centers which should always be present in pre-primary education institutions; block, book, music, art, science and dramatic play centers. Cards of different colors and names of symbols of the centers in the class should be prepared and placed in a place where children can see and should be adhered. For example, for a book center, a card with a picture of a child reading a book / book or a card for the art center, and a card with a picture of the palette and paint brushes can be prepared.

#### 3.5.4.2 The Importance and Characteristics of Learning Centres

Early life experiences determine the attitudes of the child to the educational institution, his / her interest in learning and his / her self-knowledge, and affect his / her academic success (MEB, 2013). A quality pre-school education enhances the chances of children to enrich their learning experiences, support their abilities, attend school, ensure a successful transition to primary education and

school success, as well as increase the possibility of contributing to the society in the long term and hampers such consequences as unemployment and poverty (Tokuç, 2007). It is important in this respect that a preschool education institution is designed to meet the educational needs of children. Well-designed learning environments support children's effective learning and develop creative problem-solving skills. Careful and carefully planned learning environments are important for the success of training programs. In order to be able to plan and implement this training program in accordance with its purpose, learning environments should be arranged to include learning centers (MEB, 2013). Centers recommended to be present in preschool education institutions; block, book, music, art, science and dramatic play centers. In addition to these centers, new centers can be added considering the classroom environment and conditions.

**Book Center:** The main objective is to develop children's language and reading and writing skills. It should be positioned in the most light area of the class.

**Art Center:** Provides opportunities for children to develop their fine motor skills and creativity by experimenting and exploring art materials. The center should be near the sink and easy to clean if possible.

**Science Center:** The main objective is to promote children's research, curiosity and develop their skills such as problem solving, cause and effect relationship, thinking, using senses. In this center, except for the materials they can observe, they should be used in materials they can use actively (Ertürk-Kara, 2018).

**Block Center:** It is a center that allows children to realize the figures of different sizes, shapes and colors in their environments and the relationships between them and to use their creativity through building-building games by using different figures. A large area is needed for this center and children should be away from the centers that need to be silent as they are mobile and can make a lot of noise.

**Music Center:** Children will be able to do studies to increase their cognitive, language, motor, social and emotional skills with the help of instruments and tools in this center. In addition, the teacher should take care to make music tools and equipment that make different sounds from the material with the children.

**Dramatic Play Center:** For this center a wide area should be arranged to support children to play freely, interact with each other and create different game scenarios, and it should be ensured that this area is away from the

centers that need to be quiet. This learning center includes materials that allow the child to take different roles, to make new discoveries, to visualize events and people as improvised from daily life.

### **3.5.5 MNE and Montessori Approaches**

Montessori kindergarten education has been implemented in practice in the Gazi University in Turkey for the first time officially. Today, it is applied in different learning environments in many cities. The implementation of the Montessori approach, its physical order, its materials and the mission of the teacher differ from the programs in our country. In Montessori the environment is prepared by the teacher but is constantly revised according to the needs of the children. After working with materials, children know where to put it. The materials to be given to the child in Montessori are expected to represent the real life. However, given the preschool education institutions in our country, such a class order or the realism of materials is not very common (Özbek & Ayaz, 2017).

In Montessori's approach, the teacher's greatest task is to observe children. In the updated preschool education program, there are observation forms, development reports and portfolios where the children are observed and their results are recorded. In the Montessori approach, individual activities, which are centered on the center of the child, are at the forefront, while small and large group activities are included in the current pre-school education program, although individual activities are supported. Another characteristic of the Montessori approach is the simultaneous education of mixed age groups, which is not possible in our country when compared with the learning environments where the current pre-school education program is applied.

### **3.6 Contemporary Methods and Approaches in Preschool Education**

John Lock, who lived in the 17th century, began to undergo a change in his perspective on society by means of the concept of Tabula Rasa. After that, different approaches to child care and education were discussed. While some of these views and approaches cannot keep up with time and changing situations, some of them have survived to the present day by proving their validity and reliability as a result of long-term research. Some of these approaches have become universal by crossing the borders of the country in which they were put forward and continue to be used in many countries around the world. This section will focus on these approaches: Reggio Emilia, Waldorf and Montessori.

### **3.6.1 Reggio Emilia Approaches**

The origin of the Reggio Emilia Approach is based on the Second World War. The people of Reggio Emilia decided to evaluate the aid given to them by the post-war state by building a school for the children's future. The first teacher of the school, which was completed with the support of the people, was Loris Malaguzzi, who made great contributions to the philosophy of the approach (Şahin, 2014). Malaguzzi argues that education is a right and that children should work in cooperation with school, family and society in order to get a quality education (Metin & Aslan, 2017).

In these learning environments where the views of Vygotsky, Dewey, Bruer and Piaget are felt, children are important. In this approach, each child is individually focused, while the child's family, friends, school environment and the relationships with the community in which he / she lives are considered (Metin & Aslan, 2017). The image of a strong child, a multi-role teacher, a rich and educative environment, strong relationships, project-based learning are the prominent principles of this approach. In the Reggio Emilia approach, the child is a part of the society in which he lives, expressing his own needs and receiving the same respect as adults, not as someone who is incapable of needing continuous help, who fails to do business on its own (Şahin, 2012).

The foundation of learning in Reggio Emilia is projects. These projects can last for a week or even a few months. These projects are considered as units created with the help of teachers based on the ideas of children. Teachers, parents, visual art experts (atelierista) and child development experts (pedagogista) come together in a project inception and process to discuss which subject concepts can be taught with the project (Edwards, Gandini & Forman, 1998).

Teachers' dedication to understanding children in the long term is the main point of the Reggio Emilia Approach. The most important task of the teacher is that she is the one who learns with children. Teachers should listen to children, observe, communicate with them, contribute to children's learning and learn something from children. Two teachers in the classroom routinely share their responsibilities. Thus, a teacher constantly makes systematic observations, takes notes and records children's speeches. These observations are planned and evaluated according to the curriculum, shared with other teachers, visual art experts and families. Teachers in different learning environments often work together under

the leadership of the pedagogy and learn from each other (Thornton & Brunton, 2010) .

The physical environment has an important place in the Reggio Emilia preschool program. The main purpose of the planning of new spaces and the reorganization of the old ones is the integration of each class with the other parts of the school and the environment around the school. The aim of teachers is to prepare rich environments that will lead children to research and problem solving. At the entrance of the learning environments, there are mirrors (on the wall, floor and ceiling), photographs and works of children to attract the attention of both children and adults (Aslan, 2005). Classes are opened to a common square, kitchens are open, access to the outside environment, windows in the size of the walls, courtyards and doors from each class to the outside is provided. There are also exhibitions of the project work and class materials at the entrances of the classes. In any case the environment is organized in a clear and informative manner for those who want to see (Pekdoğan, 2012). Other supporting features in the environment include large areas of continuous reorganized materials to attract interest in their aesthetic characteristics. Teachers and children gather in this area for chats and discussions. The materials should be rich in color, texture and patterns. Children should be guided to see colors and tones, to feel texture, and to recognize similarities and contrasts. Reggio Emilia is also often referred to as the third teacher (Edwards, Gandini & Forman, 1998).

### **3.6.2 Waldorf Approaches**

The Waldorf Educational Approach was developed in 1919 by Rudolf Steiner. The Waldorf approach is a holistic approach that aims to transform education into an art. It aims to develop children's social, emotional, spiritual, moral, physical and mental aspects in a balanced and versatile way. Special emphasis is placed on supporting the individuality, self-confidence and integrity of children (Çelik, 2013; Onur & Topkaya, 2017).

The basic principle of Waldorf education is to enable children to develop an understanding of their understanding and place in the world. According to Waldorf, people are primarily citizens of the world. For this reason, the aim of the Waldorf Education, which aims to educate children in all aspects, is the philosophy of heart, mind and talent for all children. The Waldorf Education Approach does not focus much on current information in order to reach and

improve the child's hidden skills. In this way, the child enjoys learning and exploring the world is fun. According to Waldorf learning environments, when children link learning between their own experiences, they become more relevant and lively and begin to learn with these experiences (Nicol, 2016).

The classroom environment is designed to address children's senses. According to Steiner, children are extremely sensitive to their environment and learn about their environment by using all sense organs. Therefore, the colors of the walls, furniture and materials in the class are important (AÇEV, 2015). Plain, non-eye-tight colors are preferred. Furniture made of natural and solid materials are used. Since the toys in the classroom can be used for many different purposes, they are encouraging children's imaginary games (Çelik, 2013). Children, friends through friendship is established. They can apply what they learn by taking a role in different situations. In the classroom, natural materials are included in order to recognize nature and to join with nature (gourd, cones, branches, pebbles, etc.). Children are encouraged to take on some tasks within the classroom to improve their imitation abilities and to help them take responsibility. For example, repairing, preparing snacks, cleaning tables, taking care of flowers. While carrying out these tasks, children make their own choices. The teacher does not force children to do a job and children are allowed to make their own choices (Kotaman, 2009).

Waldorf classes are part of the home environment. Based on Steiner's theory, academic education is not considered appropriate for children before the age of seven. A classroom environment full of rich stimuli supports children's learning. For example, the teacher helps to support children's language development through stories, poems, and songs. Children's math skills are developed through imaginary games. Art, music, drama and science activities are included as in every program. All this does not take place as a transfer of knowledge from the teacher to the child. There is no compulsion in the learning phase. Naturally, children are provided with these skills (Onur & Topkaya, 2017).

Teachers acknowledge that each child is a different individual. Early ages, especially pre-school period, are of great importance. For this reason, teachers do not rush pre-school years and take steps to form the basis for later periods by knowing that they are a different individual to each child. Waldorf teachers prioritize respect, enthusiasm and safety. Since children are very interested in

what is happening around them in the first seven years of life, the teacher is obliged to provide appropriate stimuli to the child. The teacher should approach the child with respect and allow him to learn at his own pace. Because the important thing is not the speed of development. What is important is the quality completion of the development (Nicol, 2016).

Teachers try every way to cooperate with families. It shares responsibilities in the child's development process and tries to maintain consistency between home and school. Regular family training and mutual information sharing is done. Families are taught tools and methods that can support their children's development and learning at home. In this way, it is ensured that the environments where children can reveal their true potential are sustained (AÇEV,2015).

### **3.6.3 Montessori Approaches**

It was developed in 1907 by the Montessori Method Maria Montessori, which was introduced with the first Children's House. M. Montessori, the first woman doctor of Italy, established the method of her method with her studies on mentally ill children and decided to adapt her method to the education of children with disabilities as a result of her success. For the first time, the approach applied in the Children's House reached maturity with the guidance of children's interests, attitudes and behaviors (Feez, 2010).

On the basis of the Montessori Approach, it is possible to find the effects of Rousseau, Pestalozzi and Froebel with the free education approach that believes in the potential of the child. It is possible to see the traces of Rousseau and Pestalozzi in the Montessori approach. These are; education based on the education of senses, libertarian education, education based on the views of individual education, education with mixed age group (Özbek & Ayaz, 2017).

#### **3.6.3.1 The General Purpose of Montessori Educational Program**

The Montessori approach aims to educate the child with real activities and child-centered learning experiences that connect the child to the natural world instead of toys. For this purpose, there are some principles adopted by the learning environments where the approach is applied;



1. **Respect for the Child:** Providing self-effective learning by offering options to the child, gaining autonomy and developing positive self-perception.
2. **Absorbing Mind:** The child is not an empty container to be filled. The child learns by configuring itself without needing to teach someone else.
3. **Periods of Development and Sensitivity:** The child learns certain things more easily during each development period. These periods are also the times when it is more open to environmental stimuli (Montessori, 1912).
4. **Multiple Age Groups:** Classes should be not divided according to levels (kindergarten, first grade), but according to their developmental periods (early childhood, primary and secondary education).
5. **Auto-Control:** Children with freedom of choice control and learn by themselves.
6. **Child's Love of Working and Repetition:** The play is not considered a leisure time, and the desire and the will of children are respected.
7. **Polarization of attention:** Children work by focusing on materials in continuous time periods (Özbek & Ayaz, 2017).

In the Montessori approach, the child is in the process of learning through the interactions that s/he has established by moving towards the target rather than being a passive, recipient. This approach encourages the child to understand his/her environment through natural observation, to explore the surroundings with questions of what and how, to test hypotheses and to improve their natural curiosity (Montessori, 1912).

#### 3.6.3.2 Development Phases of Preschool Children According to Montessori Approach

According to Montessori, who defines childhood as the most dynamic period from developmental point of view, development is not a linear unidimensional process starting from birth to maturity. Four stages are defined, including processes that are associated with each other and which progress in a certain rhythm and which are called sensitive periods in development; infancy, childhood, adolescence and maturity (Lillard, 2011).

The Montessori approach is often known to be used in preschool institutions but can be applied at all levels of education, including high school. This approach classifies children and young people according to their level of development.

According to this classification, education levels are created (MAF, 2019). These are;

- 0-3 Age program,
- 3-6 Early childhood,
- 6-9 Primary School,
- 12-18 Secondary and High School.

Children are educated in the same class according to this age range. Because children outside the school also interact with people of different age groups, not only with their age group. Very old grouping allows the small child in the classroom to watch older children working, so that they can get an idea of the future work and help older children help young children, thus reinforcing what they have learned (Lillard, 2011). In the Montessori Approach, very age grouping can be implemented through individual training. Today, mass education is carried out based on the assumption that students in a class mostly learn the same subject at the same time (Guttek, 2004; Isaacs, 2015).

3.6.3.3 Children's Learning Skills According to the Montessori Education Program Montessori, 'Game is the work of the child.' with the words of the importance of the life of the child has emphasized. In this context, pre-school education offers great opportunities in terms of meeting the needs of children with their peers, meeting their needs with time and developing the concept of self in a healthy way. Children will be able to identify their strengths and weaknesses in preschool education settings, which are prepared so that they can be with their peers and spend time together (Akduman, 2010).

Montessori mentions the periods of susceptibility that enable the child to acquire a special ability and culminate in the acquisition of this ability. When it does not act according to the requirements of the periods of sensitivity, the ability to discover a new ability will be lost. These skills can be gained later. But if it is not gained during periods of sensitivity, then more efforts are needed to be won (Guttek, 2004).

These sensitivity stages and age periods are as follows:

- Movement (0-1 years),

- Language (0-6 years),
- Small objects (1-4 years),
- Layout (1-2 years), music (2-6 years),
- Elegance and kindness (2-6 years),
- Sensitivity of the senses (2-6 years),
- Writing (3-4 years),
- Reading (3-5 years),
- Spatial relations (4-6 years),
- Mathematics (4-6 years) (Guttek, 2004).

In these sensitive periods, the working mind of the child mind is different from that of adult. The child will learn in a situation known as 'absorbing mind' during this period. The child can learn these issues much more easily during periods of sensitivity. For this reason, academic studies in Montessori kindergartens are given importance due to these sensitive periods (Lillard, 2011). The most beautiful example of learning through absorbing mind in sensitive stages is to learn a child's native language. Any language to be learned after the 0-6 year period, which is the sensitive stage for the language, cannot be learned with the ease of mother tongue nor as well as it. However, it is observed that children easily learn 2-3 languages in 0-6 age group.

In the Montessori classes, the following types of activities are applied for children aged 3-6.

- Daily life skills,
- Developing senses,
- Communication, language and literacy,
- Maths,
- Cultural characteristics,
- Creativity (Isaacs, 2014).

#### 3.6.3.4 General Design Characteristics of Montessori Learning Environments

The Montessori Method attaches great importance to the child's independence. Because independence is needed to use freedom. Therefore, Montessori's educational environment is designed to give children independence. Unnecessary help to the child by adults is the biggest obstacle to his independence. For this reason, the Montessori teacher is passive in the

classroom and does not provide unnecessary help to the child. Class furniture from Montessori Approach is designed in child size (Montessori, 1964).

In the Montessori Approach, materials such as the control of the error, the panels in the walls, and the products such as pictures should be hung at the eye level. Children should be actively involved in meal times. It contributes to the preparation, collection and cleaning of the table. At the same time, they are responsible for the cleanliness of the class and are important applications that help children to dominate the environment and gain independence. One of the most important elements of the method in pre-school and primary school stages is the specially designed materials. These materials lead to self-control through self-control and help the child to move towards specialization through subsequent activities. Since each material contains control of the error, the child can work on his/her own without the help of a teacher (Montessori, 1964). The teacher introduces the material to a child who is ready for a new material with a special presentation method. This includes all the steps from the removal of the promotional material from the shelf to the later placement of the student to the rack for the student to be used. After the teacher presents the material, the child will work on his own or with small groups formed by himself until the child specializes in this material. The teacher will observe and record the work of the child. Montessori materials are placed from simple to complex on shelves that children can reach according to their daily life, sensory, cultural, linguistic and math curriculum areas. There is only one set of materials in the Montessori class. It develops a spirit of unity among these children, although it is not explicitly requested. To work with a material that someone is working with, the child must ask permission to use or wait for him to finish his work. This also prevents children from working with the same materials (Guttek, 2004).

In a preschool class with an average of 25 people, everyone will have the opportunity to follow the use of materials by their friends, as they will work with different materials. Each part of the Montessori material is carefully designed and is part of a series of other materials from simple to complex. As children move through a series of materials, they naturally move from sensory activities to concrete stages.

Montessori divided his materials into 5 groups;

1. Daily living materials
2. Sensory materials

3. Mathematics materials
4. Language materials
5. Universal Education (Geography, biology materials) (Isaac, 2015).

The reality and naturalness around Montessori is of great importance. The aim is to teach the child its nature. This natural and real environment can also find all the pieces of material necessary for the child's choice of his / her own material. So the child becomes part of the order in class. Each material has a constant place in this order. All materials are clean, complete, and have an aesthetic appearance. This allows children to study carefully and to complete the study without any problems. The beautiful, elegant and attractive colors of the materials to be used encourage them to practice. In particular, the suitability and uniformity of the parts used in a set allows children to easily find all parts of that study (Feez, 2010).

## **CHAPTER 4**

### **BIOPHILIA IN PARTICIPATORY DESIGN**

In the participatory approach, biophilia aims to give children the right to speak while designing preschool classes with biophilia design in order to develop children's connections with nature and to offer children a good future in spiritual and physical terms. This chapter explores the definitions of participatory approach and biophilia design concepts and the effects of these concepts on children. Then, a biophilic participant design proposal will be presented.

#### **4.1 Participatory Design**

Participation can be expressed in many ways, such as playing an active role in the design process, supporting and contributing to this process. The participation in which common decisions can be made is based on the fact that individuals can meet at a common point, respect each other and express their opinions freely, although they defend different opinions. To be able to adopt the new ideas that have been developed, to accept that the differences arising from various ideas are treasures. To help lay the foundations for the formation of new ideas (Sanoff, 2002).

The idea of participation is to increase the social development of individuals in the society through democratic and liberating practices. At the same time, individuals develop their sense of ownership in their designs (Muller et al. 1991; Sanoff 2000; Greenbaum & Loi 2012). Individuals are more strongly able to take on the events that they take responsibility for as long as they can participate in an event and can be included in the results that arise with this participation.

The aim of participatory design, which is a human-centered concept, to create products, areas, and services that can be more useful to the needs of users. In the decision-making process, the views of the participants are directly taken and contributes to the development of these views (Simonsen & Hertzum 2010).

Therefore, the aim of the participatory design can be interpreted as a combination of many different theories and applications, including planning and designing the areas where people will live and spend time. According to Hester (1990), participant design argues that when they have the ability to make decisions in the design process, their inner feelings and pride have emerged.

For participatory design, it is important for people to be actively involved in the given areas rather than passively, and to feel that their ideas are heard in this process. Thus, the planning and design process becomes a learning process for both designers and participants (Sanoff, 1990). Participatory design encourages individuals to participate in the social environment in which they live and contribute to the areas in which they live and to give them more speech. Participation not only strives for better product services and systems, but also promotes and reinforces participants' inner motives (Couto 1987; Sanoff 2000). Robertson and Simonsen (2012) believe that with participatory design, people should be involved in the design processes of products, environment, enterprises and social institutions, and that the needs of individuals can be better met.

All living areas with different dimensions ranging from the smallest location to the existence of cities are composed of common living spaces integrated with each other (Habraken, 1982). The needs of individuals vary with the changing time. However, living spaces are also differentiated. Therefore, designers need to be in touch with the users in order to create new areas for the users who need to change the design process.

The concept of participation is the process of demanding the best for individuals, as well as definitions such as giving people the right to speak, democratic and open environment, unprocessed information (Miessen, 2010). The participatory design approach argues that individuals can develop their creativity and offer a different perspective in the cultural landscape arrangement (Sanoff, 2008) and that the users should express their ideas freely in the design process (Hurst, 2000).

When the participatory design process is examined, it is seen that this is not a result oriented process. When the non-participatory design process is considered, it is seen that the process during implementation is quite different from the participatory approach. Not only the participant who manages the

process with the non-participatory design, but also the needs, desires and needs of the users. In this context, the role of users in new designs remains only one consumer. Only when the question of whether the design is appreciated is the right of the users to express themselves (Reich et al. 1992; 1996). However, this idea and implementation process is quite the opposite of participatory design. Because the participatory design advocates that the decisions should be taken jointly with the participants. Therefore, the ideas of the participants are very important in the existence of a design (Bjögvinsson, Ehn & Hillgren 2012).

The design process, which includes many areas of life, should be able to direct different disciplines and individuals in different conditions to work together with the designer and the user (Petric, Mayer, Jonti, Ucelli, 2002, 2). As in all other areas, joint decision-making in common living spaces, individuals to express themselves and to respect the ideas of individuals in different emotional thoughts is a democratic sharing is realized. Creating a democratic environment within the participatory approach is very important. In this respect, participatory design is a central concept for the users. According to Robertson and Simonsen (2012), individuals will have a voice in the fields and products to be designed and not only create a democratic environment, but also design that the design will be more acceptable in terms of user demands.

#### **4.1.1 Participatory Design Theories**

Design has the potential to create a critical awareness by disrupting existing systems, and can establish a relationship between people's behavior and the emotions formed over time (Markussen, 2013). In this context, the concept of user participation is an important issue that designers and participants take in the design process (Habraken, 1985). Since the concept of user participation is a combination of different concepts, it incorporates the ideas and experiences of the participants who have social content in the process of design.

In urban studies and in other fields, individuals can decide to shape their own fields and these social decisions can be transferred to the environments where different groups are together (Sanoff, 2000). Sanoff (2000) defines the process of participation as an opportunity to change the areas where individuals live. Since the concept of participation has a concept that involves various fields together, quantitative methods and research are not measurable (Sameh, 2011).

Participation has a balancing position between the participants in the society and in the planning of the design process. Participatory planning has social structures



similar to the development of rights granted to participants. In this respect, public participation has an impact on the achievement of the aims of the society and groups (Smith, 1973).

In order to transfer the concept of participation to a method that is difficult to solve, some theories have been formed by many researchers (Turner,1978). In one of these, Irvin and Stansbury (2004) determined the advantages and disadvantages of Citizen participation. Irvin and Stansbury (2004) discusses the participation of citizens in the decision-making phase of local governments as advantages and disadvantages within the scope of the administration and citizen participation, and discusses how the decision-making process should be and the results of this process (See Table 4.1).



**Table 4.1** Advantages and Disadvantages of Citizen Participation in Decision Making Processes

		CITIZEN PARTICIPATION		GOVERNMENT	
	ADVANTAGE	DISADVANTAGE	ADVANTAGE	DISADVANTAGE	
<b>DECISION PROCESS</b>	<ul style="list-style-type: none"> <li>• Education (informing representatives)</li> <li>• The government's ability to persuade and illuminate.</li> <li>• For Citizenship identity acquisition.</li> </ul>	<ul style="list-style-type: none"> <li>• Ignoring the decisions taken.</li> <li>• Loss of time if decisions are ignored.</li> </ul>	<ul style="list-style-type: none"> <li>• Education (informing citizens)</li> <li>• Citizen, persuasion and trust building.</li> <li>• Strategic agreement</li> <li>• The legality of decisions.</li> </ul>	<ul style="list-style-type: none"> <li>• Obtaining results.</li> <li>• If the decisions taken are ignored, there will be financial loss.</li> <li>• The loss of confidence of the citizen to management as a result of not implementing the decision.</li> <li>• Better practice decision.</li> </ul>	
<b>RESULTS</b>	<ul style="list-style-type: none"> <li>• Remove obstacles to reach the conclusion .</li> <li>• Participation in the process of participation and to have a say.</li> <li>• Creating more feasible decisions.</li> </ul>	<ul style="list-style-type: none"> <li>• If the opposing groups affect the intake of decisions, the emergence of worse management.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove obstacles to reach the conclusion.</li> <li>• Reduce the costs associated with the problems.</li> <li>• Creating more feasible decisions.</li> </ul>	<ul style="list-style-type: none"> <li>• The loss of decision-making control.</li> <li>• Adoption by management because bad decisions cannot be rejected.</li> <li>• Restrict the budget so that existing projects can continue.</li> </ul>	

(Source: *Invin ve Stansbury, 2004*)

As mentioned in Table 4.1, it is seen that the participatory approach process in the decision-making process is very useful when it is examined correctly. However, this process does not go as desired and if the process can not be evaluated correctly, there are serious disadvantages in both sides. However, this process does not go as desired and if the process can not be evaluated correctly, there are serious disadvantages in both sides. If these conditions are not met, the situation will affect both sides negatively. The ideas and thoughts of the affected participants are not taken seriously, and if they are not made feasible by the administrations, the suspicious approach of the participants and the process will increase and will eventually lead to a lack of trust. The lack of trust in the

participatory approach is certainly not correct. In this direction, the benefits of the participatory approach will be seen more clearly in the projects by taking more feasible decisions in order to undertake the duties that fall on both sides. Therefore, some theories have been developed by the researchers to make the design more applicable in this complex structure (Turner, 1978).

One of them, Irvin and Stansbury (2004), determined what the ideal conditions of participation were. According to them:

- Contribute to the benefit of the project to be created by the citizen,
- Participating individuals can easily reach the decision-making areas,
- In order for the participants to participate in the decision-making process, financial assistance is expected from them,
- The individuals of the participant group to be formed consist of individuals with different cultures, ideologies and structures,
- Participants and other individuals do not need to have superior technical knowledge.

At the same time, according to UN Habitat (2009), it argues that participation is necessary but the applicability is generally ignored. Therefore, there are certain conditions for participation to be applicable. These are:

- Granting permission of the opposing groups to present their reactions to the decision process and to support the society,
- Taking the decisions seriously in the accession process should meet at a common denominator,
- Learning the views of the other participants in the process of participation which includes different disciplines,
- Increased participation in social consciousness and urban development.

If these two similar conditions can be achieved, it seems that participatory approach designs are always more viable. According to Kunz (2006), when the participation is made in the right conditions, the points reached are as follows:

- To meet the problems of the basic needs of people in the areas where they live and to meet them correctly,
- The formation of a healthy and educated environment,
- Development of physical development and mental awareness,
- With the interaction of individuals in the society, social cohesion and their sense of belonging towards the environment they live in has increased,

- Affecting the spiritual and cultural structures of individuals towards themselves and their environment,
- The results are achieved, such as the fairness of the participants in decision-making and direct access to resources.

#### **4.1.2 Participatory Design Methodology**

Participants undertake serious responsibilities with the participation of individuals in social, social and cultural issues. In finding solutions to these problems, it is important to obtain support from the experts to ensure that the participants are willingly involved in clarifying the solutions. In this process, the participants should be included in the design processes except the lack of technical methods. According to Sanoff (2000), the accession process is to be guided by the participants in a correct way to their effectiveness and to make the participants feel a sense of achievement. Therefore, in the participatory approach, some methods have been developed by the researchers to accurately incorporate individuals into the areas where decisions will be taken (Turner, 1978).

In order for the developed methods to function properly, planning and targets must be determined properly and the overall strategies in the process should be done correctly. As the concept of participation is a long-term process, it is imperative that all methods and techniques should give importance to the correct planning and clear determination of the targets to be determined. Many methods have been developed by researchers to shape the environment, to increase the intellectual development of the individuals in the society and to involve the participants in the decisions to be taken. Thanks to the different methods developed by the participants and the process managers, the participatory design approach can provide a more useful progress (Sanoff, 2000).

It is important to determine the useful methods in the participation processes of each project in which the participant individuals are actively seen, in order to harmonize many different ideas and to improve the participation process (Thompson, 2008, Wates, 2008). Many of the developed projects should be reshaped against the problems that need to be adapted in the changing time and have their own method and technique. The methods vary depending on the energy within each project, the participation of different groups, technology and designers (Sanoff, 2000, Wates, 2008).

The identification of many methods and techniques proposed by the researchers depends on the number of people in the project, time, planning, differences in the group, and the type of information to be obtained. In addition to the fact that each project should determine its own method, the information to be reached at the end of the process can be adapted to the desired group in different techniques. For example, in the flow of quantitative and qualitative information, whichever process should be used depends on the process of the project. At the same time, this information can be obtained by using various techniques. Therefore, Sanoff, Wates and Toker U suggest different methods to be used at different times of the process, as seen in Table 4.2 (Sanoff, 2000, Wates, 2008, Toker, 2012).

**Table 4.2** Different methods of Participatory Design

<b>Awareness Methods</b>	<b>Indirect Methods</b>	<b>Group Interaction Methods</b>	<b>Open-ended Methods</b>	<b>Brainstorming Methods</b>
-Exhibition in public place	- Surveys and Questionnaires	-Workshop	-Public Forum	-Gallery
-News Media and Social Media		-Charette process	-Participation cable TV	-Pin card
-Walking Tours		-Design-in	-Planning Ballot	-Nominal Group Technique(NGT)
		-Participation Games	-Digital Technology	-Cranford Slim Writing
				-Ringii Process
				-Delphi Method
				-Interactive Brainstorming
				-Group Process

(Source: Sanoff, 2000; Wates 2008; Toker, 2012)

Sanoff (2000) mentions many participatory approach techniques such as strategic planning, vision, charrette process, community action planning, participatory action research, participation techniques and visual preference assessment. Although each technique has its own methods, we will talk about the main participant technique. In the above table, 5 main participant technical methods are indicated. They are grouped together in sub-headings according to the method technique. To mention briefly;

**Awareness Methods:** Awareness method is important for the proper functioning of the participatory process. It is necessary to encourage people to participate as well as to know what problems and targets are in the areas where people will participate as participants. For this reason, exhibitions and fairs organized in

public places will enable participants to know what they are participating in. At the same time, the news media (radio, newspaper and television), such as an article or announcement given to individuals and the power of persuasion is developed. With the theme of sensitivity to environmental issues, people are given the opportunity to get acquainted with the environment they live in and to raise awareness by walking tours in the areas (Sanoff, 2000).

**Indirect Methods:** Surveys and Questionnaires provide information on the ideas and opinions of people. With this approach, the measurements are made more easily, although not based on scientific data, and the results are obtained more quickly (Spinuzzi, 2004).

**Group Interaction Methods:** The method of group interaction is one of the methods, which facilitates the participatory process and includes the most work in the workshop. As this method is long-term, participants in the groups formed must solve problems and actively participate in the groups (Sanoff, 2000, Wates, 2008).

It is a long-term participation process that is shaped by the complex structure of the project, in which the ideas of the participants and the people who manage the project can be shared with the charrette process as a part of this method. With this process, many groups that have variability within themselves determine the problems identified in the operation of the project and conduct many group meetings in order to solve the problems arising from these problems. With these group meetings, ideas are developed, suggestions are presented and the decision-making phase is made easier (Sanoff, 2000).

A charrette is a participatory process in which participants are able to make their decisions and debates through designs, with the process of gathering information for the participants to be effective and starting with the exchange of ideas in accordance with the collected information. Part of this process is "Design-in". With Design-in, designers and participants can produce new alternatives by discussing different ideas. Drawing programs, which are used in conjunction with developing technology, also have an impact on this process (Sanoff, 2000, Toker, 2012).

Participation games, which are the final part of this process, as mentioned in Jerome Bruner (1967), have the most effective role in the learning process and

enable people to participate in the process by developing their desire to learn and to participate. Duke (1974), who defines the game as the best learning process, also needs to use the games as a learning tool in order to enable individuals with different views to better understand the process and accept different thinking structures (Abt, 1970).

**Open-ended methods:** This is a part of the method of the public forum to transfer the decisions taken to the target audience and informed about the project, people are approved about the process. Since public meetings are held within a limited period, the participants of the project and the participants are very limited about the process. On the public forum, which is an open meeting, voting is carried out by hand raising method (Sanoff, 2000; Waste, 2008).

According to Sanoff (1994), different television programs predict that people can participate more in projects. According to him, television should be used as part of the participatory process. This makes it easier for communities to be informed about the process.

The planning compass is a form of method designed to enable groups to meet with each other and to express themselves in public meetings. With this method, it is aimed to develop active citizen participation (Sanoff, 2000). This is the latest piece of digital technology. To create the animation of the project which is planned to be done using the computer together with the developing technology and to show what the interior and exterior will look like (Waste, 2008; Sanoff, 2000).

**Brainstorming Methods:** According to Lumsdaine & Lumsdaine (1993), although what is necessary in teamwork is the problem solving, the most important thing is to produce ideas rather than problem solving.

In this method with small groups, the problem is solved in a verbal way and different written brainstorming techniques have been developed for large groups. Some are as follows;

The Gallery and Pin Card methods are a bit similar. Both are formed by writing ideas on paper within a group as individuals who cannot express their ideas within a group and ideas are taken for consideration. With the Nominal Group Technique (NGT), participants should quietly write their ideas on paper in a short

period of five minutes. Then the ideas are discussed by the group (Delbecq, Van de Ven & Gustafon, 1975). The Cranford Slip Writing method is used in a large group, but participants are asked to write 20 ideas on a sheet of paper. Evaluation is carried out by individuals in another team. During the process of Ringii, participants take notes in the process and send these points to the project's practitioner. The ideas with the Delphi method are carried out by computer and or survey applications, not through direct interaction. The process is not interrupted until you reach the best idea in this process. The ideas collected are evaluated by each participant (Delbecq, Van de Ven & Gustafon, 1975). With interactive brainstorming, the ideas of the participants are taken orally and in writing (Waste, 2008). During the group process, participants can work with each other and share their ideas orally (Toker, 2012, Waste, 2008).

As a result, there are many methods used in the participatory approach. Designers must carefully decide how these methods should be included in the process. In this way, they can achieve useful results from the projects they will get through a proper participation process.

#### **4.1.3 Participatory Design with Children**

The concept of participatory design cannot be defined by a single definition. Nevertheless, participants who adopt participatory design share some opinions: 1. Design ideas are shaped by the opinions of the participants from different conditions. 2. Designers should spend time with each other in the environment in which they are located, rather than focusing on the area in which they will be designed. 3. Any decision must be taken democratically with designers and participants (Sanoff, 2007). In this respect, the first thing that needs to be done regarding the user participation in the design process is to conduct field research and gather information according to the needs of the users. However, in the designs made for children, the designers are consulted by their parents and teachers instead of consulting the children who are the main users (Druin, 2002). This situation, as mentioned above, is not suitable for the user participation process but why the solution of children's lack of participation in the process of participation can be evaluated by looking at the short historical process of childhood.

Before the 18th century, children in the West had been kept in the family environment until the age of six to seven. Later, children were treated as adults and certain positions were given to be active in social life for their liberation



(Jans, 2004). With the emergence of children's rights at the beginning of the twentieth century and the emergence of compulsory primary education in children's education, children were separated from the existing fields of study and included in the education process. By this way, the difference between children and adults and the level of the community where children were formed changed and children were kept under certain limits such as home and school (Cunningham, 1995; Jans, 2004).

In the United Nations Convention on the Rights of the Children, which is the most widely accepted human rights declaration, children are granted certain rights. Some of these are the complete development of the child in good conditions and the protection of the child from harmful effects and abuse that may pose a threat to his / her personality. At the same time, participation in family, culture and environmental issues within social life should not be prevented. This agreement does not discriminate between children and the decisions are taken according to the benefit of the child and the right to participate in the areas where they will live and develop (UN Children's Right, 1989).

According to the children's rights convention, children are considered as children until they are 18 years of age, and their needs are provided by their parents and children are protected. However, it is argued that children should have the right to participate in the decisions they will have about their lives and in areas where they can express their ideas freely (UN Children's Right, 1989).

According to Wyness (1999), the process called *ve childhood süreç* is a process of playing games and needs are provided by adults. Children should not be affected by the negative aspects of life. The level of competence of children to participate in design is also criticized. The focus of child participation is that children have the same voice as adults in social life and can be treated equally with economic and cultural classes (Kymlicka, 2002).

Adults find it difficult to understand children's views and areas of interest (Sommer, 2003). We need to understand how the communication should be between adults and children, how the adult needs to be completed in the life of the child, and how to take care of the children in this way (Skivenes & Strandbu, 2006). The aim of child participation is to ensure that there is a consensus between adults and children. At the same time, by looking at the experiences of

children in this process, it is to develop the potential of adults to understand them (Kjørholt, 2001).

Designers should make designs in line with their needs, especially in areas where children can be involved. While making these designs, designers should give importance to how children should be involved in the project and contribute to the area to be designed (Hussain, 2000). At the same time, taking into account the family structure of the child, the child should be encouraged to participate in the environment in accordance with the conditions and conditions (Hart, 1992).

Roger Hart's (1992) mentions a stair of participation in which he argues that there are eight ways to involve children in projects. (See Table 4.3). This model, which has not been designed for use only in design projects, can be used directly in all projects for children. According to Roger Hart's (1992), child participation is divided into two categories.

**Table 4.3 Roger Hart's Participation Ladder**

<b>DEGREES OF PARTICIPATION</b>	8. Child-initiated, shared decisions with adults	In the project initiated by the children, the decisions are made by the children, but from the adults they take the ideas.
	7. Child-initiated, and directed	Children start and manage the project. Adults are passive.
	6. Adult-initiated, shared decisions with children	The project is initiated by adults and children continue. Children are included in the decision-making phase.
	5. Child-initiated, shared decisions with adults	Although the project is determined and conducted by adults, children are given sufficient information. They can express their ideas freely.
	4. Child-initiated, shared decisions with adults	Children are informed and assigned tasks by adults. The child performs voluntary participation. However, the impact on the project is low.
<b>NON PARTICIPATION</b>	3. Tokenism	Children are asked to be participants, but opportunities are limited. Participation is for demonstration.
	2. Decoration	The children are dressed in printed t-shirts and dance in certain projects without explanation. They are used as decor according to given commands.
	1. Manipulation	The final decision of the child is the limited participation of the child. Kids don't know about the process.

*(Source: Rogert Hart, 1992)*

Thanks to this model of Hart (1997), in many areas where children's right to speak is limited, adults, designers and others who will carry out the project will be more useful to children by identifying their wishes. One goal of Hart's participation ladder is the failure of many projects that show children as participants. It should be noted that children are part of the social culture. As is argued in participatory

approach, each participant must have the freedom to make decisions in their own fields. Therefore, participation and other rights of children as part of social life should be kept at the highest level (Smith, 2009).

#### **4.1.4 Children's Environments formed with Participatory Design**

In order to understand the children's ideas and ideas about their habitats, one should first look at their spatial perceptions. The famous child psychology research Piaget (1929), with the results obtained from his research on children, states that the most important factor for children to perceive spaces is mental development and ages.

There are four main periods of mental development. These are expressed as sensory dynamic (0-2 years), pre-treatment (2-6 years), concrete procedures (6-12 years and formal procedures (12 - other age). (0-2) and (2-6) years are the periods when children's senses, intuitions and perceptions are active. (6-12) and (12 - other) is the period when the age period has gained independence with stimulants, it shows its individuality and its ability to think develops (Piaget, 1929). According to Piaget (1962), every period of child development is shaped by the influence of the previous period. In all these periods, children start to develop their cognitive development in order to understand the environment.

Naturally, the way in which children who are in the transition phase from sensory to cognitive stages are different from adults. Both the experience and the size of the spaces are used according to their needs. However, he does not have the right to choose his own time. Many factors such as location selection, education, playgrounds etc. in most of the children's periods are shaped by adults, and decisions that are deemed appropriate before children's ideas are taken are imposed on children.

Children who are the most important building blocks of socio-cultural development are required to be a part of change, innovation and democracy. Therefore, societies should give up their oppressive attitudes towards children. Instead, areas where children can be free should be established (Hart,1997). In this respect, children should have the right to participate in the areas where they are involved. It is more accurate to see them as individuals who can have a say in the areas where they spend their lives, not just as people who play.

The main purpose of the participatory design is to be able to inspire designers to use the space to be designed (Schuler & Namioka, 1993). The term lar participation Katılım can be defined as the decision-making process in partnership with others by including them in their own lives and in their own decisions (Hart, 1992).

According to Miser (2000), the concept of participation is a tool used for the participants to reach their goals. At the same time, it is to provide and develop the common characteristics of the participants on social areas. Finally, participation is the process of planning and implementing innovations with different groups coming together.

Although the participatory design is designed for adults, new designs are made in many areas where children spend their time actively. Therefore, designers should consider the users of the designed areas as children. At the same time, adults and children's needs are separated from each other by observing them will have the opportunity to create their designs (Hussian, 2010).

Child participation starts first in the family. It then continues in other areas of school and social life. Therefore, the creation of platforms that can express their wishes and views freely in the school areas where children spend most of their time is a point that should be emphasized by designers in the fields of pre-school class design as well as in all areas of children. Therefore, it is not enough to take the views and opinions of parents and teachers. Participatory projects can lead to effective results, such as strengthening children's psyche and increasing the imagination of children.

#### **4.1.5 Participatory Design in Natural Environments**

In recent years, people's environmental awareness and awareness have been improving thanks to developing technology, communication tools and social media. In this way, people can be aware of most of the environmental problems that occur in the world and they have a better perception of the situation in which they are published and the environment they live. Thus, people feel that they need to change their level of consciousness by protecting the environment they live in. Because environmental disorder is influenced by the culture of the people living in the society and the way of life of the people and the environmental problems will continue as long as these effects do not change (Bookchin, 1996).

According to Guattari (1990), if a solution cannot be found for environmental problems, human life on earth will gradually deteriorate, and even most of the vital activities will disappear. The relationship between the ecological movement and the human-nature relationship is addressed as a result of environmental problems and the destruction of nature. Human and nature are inseparable. Human is a living entity in nature. They have to live in nature and therefore must be in constant interaction with nature. With this necessity, human beings have a repressive attitude towards nature by considering their own needs.

However, the ecological movement does not allow the alienation of human beings with nature and believes that they should get closer. In this direction, people feel closer to nature. They begin to respond to their needs in their nature, in addition to their wish and desire. Human, by giving up their centrist attitude, starts to see nature as an integral part of their life (Atasoy, 2015).

The solution of the ecological problem is in the relationship between human and nature, questioning, changing and contributing to new projects in harmony with nature. Bookchin (1994) sees nature as a participatory part of people, but also wants to prove the socialization of nature within itself. In this respect, it is understood that the ecological approach exists within people and the destruction in nature will be solved by the inclusion of people.

In the human-nature relationship, it is observed that people are gradually removed from human life and that people are included in the process because of the destruction caused by destruction and more clear decisions will be taken. In order to solve the current problem, participatory design has a significant impact on creating awareness of what individuals need to do for nature, which is the main part of their lives.

#### **4.2 Biophilia Theory**

Wilson (1984) interpreted the biophilia concept used by Erich Fromm for the first time in 1964 as a fundamental thought in the relationship between man and nature. Biophilia can be defined as a genetic human need and tendency that arises for the purpose of connecting and maintaining people with life (Kahn, 1997). In addition, biophilia can be explained as a concept that connects with the innate needs of human beings to nature and their effects on their physical and

intellectual development (Kellert 2012, 2014; Wilson 1984; Kellert & Wilson 1993).

The concept of biophilia is the passion of nature, which is created as a result of people's admiration for nature and feeling close to nature. Despite the increasing tendency of people to the cities along with the developing modern world, their desire to be closer to nature has recently re-emerged and is making a return to nature to live a whole life away from the cities. Nature is where we feel good, where we can relax physically and mentally. At the same time, nature has healing properties such as reducing stress and getting rid of diseases (Samuel & Sarah, 2009).

Sorento (2012) refers to the biophilia approach as a desire to participate in other forms of life in nature. The benefits of contact with nature often depend on repeated experience. People may have an innate tendency to relate to nature, but as with most of the things that make us human, this biological tendency needs to be developed to feed and function (Wilson 1986; Kellert 2012).

This concept can be questioned in all other branches of science as well as in the field of architecture. In the fields of architecture and interior architecture, it is stated that biophilic design nourishes from human-nature interaction. Although biophilia is a new term, it is understood that the relationship between human and nature is not a new concept. Even in historical buildings, nature themes, animal and plant symbols are used for decorative purposes.

According to Wilson (1986), the concept of biophilia is not only a design element used in areas to be created for humans, but also as important as the general needs of which people execute their lives. Therefore, biophilic design can be interpreted as an approach that advocates the use of natural systems in interior design to improve human health. As a result of many researches and studies, it has been observed that the inclusion of natural life in interior designs has positive effects on human health and human psychology.

#### **4.2.1 Biophilia Design Principles and Objectives**

Biophilic design is in a strong bond with sustainable design in the place of natural lighting, fresh air and natural materials (Ryn, 2007). The main point of biophilic

design is the design of the structure, which has daylight, air, plants and green areas, and is designed with nature.

Biophilic design aims to create a healthy, successful and fit living space in the modern built environment where people live. There are a number of principles that must be adhered to for successful implementation of biophilic design. These principles symbolize the essential requirements for the efficient implementation of biophilic design. The principles of biophilic design are determined by Kellert and Calabrese as follows.

- Biophilic design occurs as a result of repetitions in nature and there must be a constant connection.
- Biophilic design focuses on the connection points of the natural world, which will improve the health, health and vigor of people in the contemporary environment.
- Biophilic design adds an emotional bond to certain environments and areas.
- Biophilic design enhances the beautiful relationships between people and nature, and the sense of responsibility.
- Biophilic design encourages direct interconnected and integrated architectural designs that interact with each other (Kellert & Calabrese, 2015).

Biophilic design must be repeated and in a continuous interaction with nature. The main aim of biophilic design is to enable new areas that are being shaped to benefit from natural systems. In this way, the continuity and functioning of the new areas is continuous. In a design where biophilic design is applied, workarounds and flexibility should not be provided. The use of natural ecological systems requires long-term sustainable areas. It is observed that the successful application of biophilic design can provide physical and mental benefits for people.

#### **4.2.2 The Effect of Biophilic Design on Preschool Environments**

In the world where urbanization is increasing, people spend most of their time in closed spaces, away from nature (Petrovic, 2017). However, it is very important for children to have personal ties with nature. In this way, when children are



adults of the future, they will have a protective attitude about the environment they live in (Louv, 2008).

Children exhibit a discovery in nature. At the same time they create their own learning styles in nature (Thompson & Thompson, 2007). Children's use of nature as a research area for themselves, they feel that free in nature. At the same time they decide what they want to do. They are in an environment where they can learn many things with their own games (Rivkin, 1995). For this reason, nature becomes an environment with many elements liberating themselves. It affects the development of children with various objects and materials (Chawla, 2007).

As a result of the researches conducted today, it is observed that the external environments and nature have a positive effect on the learning and developmental characteristics of the children in the early childhood period (Rivkin, 1995). For this reason, we need to make the discoveries of the areas where children spend their time properly and in this way children should be able to design their fields and their ties with nature, in a correct and functional way. Most of the children spend most of their time in learning environments. For this reason, designers need to pay attention to learning areas that will strengthen children's connections with nature (Beatley, 2011 & Browning, 2014).

Although children genetically inherit general personalities and intelligence, their role in the environmental factor is significant in their development (Louv, 2008). For this reason, it is necessary to focus on the learning areas, schools, kindergartens and houses where they spend most of their time, and the interior spaces where children spend their time to strengthen their ties with nature should be designed in line with the principle of biophilic design and thus children should be given a biophilic design principle (Moore & Marcus, 2008).

Some materials used in interiors should be reminding children of nature and at the same time there should be green space around the home and learning areas. The design of these green spaces should be at the level of improving the children's learning abilities. Designs that increase the physical activity of children and outdoor toys should provide a natural learning effect on children. In this way, children will experience different experiences of each of these products (Moore & Marcus, 2008).

In the educational areas, only the green spaces used in the outdoor areas do not strengthen the strengthening of children's ties with nature. It is important to have a homogeneous transition between the interior and exterior. In this way, children will be able to continue their development and learning in the interior. For this purpose, it is necessary to use the interconnecting design elements of interior and exterior. For example, the long windows that are used from the interior to the ceiling will allow sufficient daylight to enter the space. At the same time, many materials such as natural materials to be used in furniture, the nature sounds that can be heard due to the location of the school, bird sounds etc. should be designed in a natural transition according to the biophilic properties of the interior and exterior (Moore & Marcus, 2008). As a result of the research, it has been proved that children's learning levels, concentrations and confidence increased as a result of the transportation of natural materials and tissues brought by biophilic design (Louv, 2008).

#### **4.2.3 The Influence of Biophilic Design on Children**

Most people live in urban life and spend most of their time in closed spaces. As Petrovic (2017) states, in the world where urbanization is increasing, people spend less time in nature. As a result of the research conducted on the weakness of ties with nature, it was observed that people's lives and performances were adversely affected. Children's lives are also affected by the lack of nature of adults. As children grow and develop away from nature, their connections with nature, their tendency to protect nature and their learning abilities are gradually decreasing. Therefore, it is very important to create natural areas with participatory design for adults and children.

With the increasing urbanization of children, they cannot grow together with nature, their ties with nature decrease and the environments where they can show their own physical tendencies are gradually disappearing (Louv, 2012). By keeping up with the conditions brought by this urbanization in parents, they allow the children to spend their time in television and computer environments, limiting their efforts to find their own self (Moore & Marcus, 2008). For this reason, the love of nature given in childhood when the characters of children are formed, will be provided to be environmentally sensitive individuals besides their characteristic features such as trust and love that will join their characters in their future lives. However, the presence of adults who guide children in this educational process is an important factor (Chawla, 2006).

According to Moore and Marcus, each individual is born in connection with nature. Therefore, he argues that children have an instinctive connection to objects that exist in nature, an urge to curiosity and discovery (Moore & Marcus, 2008). For this reason, in order to increase children's ties with nature, it is necessary to establish interaction with natural world in child development and learning and to create appropriate environments accordingly (Kellert 1997; Sobel 2002; Chawla 2006).

Like Moore and Marcus, Wilson thinks that children have an innate sense of nature and that they are genetically encoded against natural life (Wilson, 1993 & 1996). According to this thought, children first develop their sensory and emotional characteristics (Kellert, 2002). For this reason, the perception of adults and children is very different from each other. Children are active learners compared to adults and behaviors in learning processes need to be planned effectively. For example, it would be more effective to allow the child to discover himself / herself rather than to verbalize something that you would like to teach children (Bredencamp & Copple 1997 & Piaget, 1952).

Children are restricted to a number of tools brought by modern life, reducing their sense of discovery over time and moving towards becoming individuals who are closing in on themselves. However, children who have contact with nature have a more developed level of freedom and imagination than children who are disconnected from nature. Children who are connected with nature calm down, provide concentration, and their senses of creativity and creativity increase (Louv, 2012).

Nature is one of the main sources of human life. At the same time, it has enormous effects on its personal and emotional development. The process of developing and realizing all these conditions by individuals starts in childhood. Children who are able to connect with nature freely develop themselves with their games and creativity in their learning processes, and develop their perspectives by revealing their exploratory features in expressing their feelings and thoughts. At this point, each individual should not lose the effect of nature during childhood and throughout his life (Kellert, 1997).

### **4.3 A Proposal for Biophilic Participatory Design**

In this section, biophilic participant design is mentioned. First, the Skivenes and Strambu's Child Participation Model. The second is the 14 Patterns of Biophilic Design. These two approaches are explained in detail.

#### **4.3.1 Skivenes and Strambu's Child Participation Model**

Skivenes and Strambu (2006) state that with the model of child participation, adults should protect the rights of children and that they should support children to participate in the events. In addition, they say that the participation of children should be combined with their subjective opinions and experiences.

According to Skivenes and Strambu (2006), children should have the right to participate in the decision-making process and to present ideas in order to involve children in a democratic society. The reason why children's perspective and children's participation is concerned is the idea of giving children the chance to stand in the field of economics as well as in the cultural sphere (Kymlicka, 2002).

The concept of a child perspective is generally a perspective that takes the children's rights into consideration, which can be shaped by newly created approaches to the study and analysis of child studies (James & Prout 1990). Child participation gives children the right to decide on their own fields and to participate in the issues. It also allows children to be seen as individuals who can freely say their opinion about the subject, not as a group that exists within the participatory community. However, the creation of participation areas where children can freely express their ideas is not enough. In addition to this, it is necessary to understand how adults and other individuals see their children, to understand their views and to simplify the participation of adults in the areas where children participate.

Skivenes and Strandbu (2006) discuss some of the methods that facilitate the effective working of children's projects, managing the process equally with adults, and facilitating child participation.

- Children should be able to express their opinions first when they make an opinion, rather than addressing others' ideas. Children should be informed in accordance with the decisions taken during the process and at the end of the process.

- Children have the opportunity to express their feelings and thoughts during the decision-making phase of the project. Children should either express themselves or express themselves by an adult of their choice.
- Child arguments created in the process should not be put aside, should be taken seriously. In the event that these arguments are not taken into account and not used, equal opportunities are not offered to the children in the project. Therefore, every information that expresses the thoughts of children is important.
- Children should be informed about the decisions taken at the end of the process and the stages of obtaining the result. The child who is informed has the freedom to appeal to the result if he wants (Skivenes & Strandbu, 2006).

The methods created help children to have a say in different areas. However, the correct progress of a participation is not only achieved by the implementation of these four procedures. Every adult is differentiated within children. Therefore, designers, adults, or other people who manage the process should consider the social and cultural differences of children and must establish the conditions for participation. In this respect, while talking about the ways in which children should participate in the areas where children will participate, differentiation in expressing their ideas and thoughts, the body language they use in communication and the stories they have acquired in their social life are important conditions to consider.

In particular, when the children of the participant class are at the forefront, the ideas created by both adults and children, such as the perspectives of both adults and children, giving children a serious role in the decision-making process, explaining the decision to the child at the end of the process and, if necessary, recognizing the right of the child to appeal it must be taken into attention. In this way, the child will have a more active role in the process of being a participant (Skivenes & Strandbu, 2006).

#### **4.3.2 14 Patterns of Biophilic Design**

As a result of the increasing urbanization, people's stress, intellectual development and health are affected. Biophilic design has an important role in the healing of these affected points. Because biophilia is a concept that aims to strengthen people's ties with nature. For this reason, people want to be included

in their living spaces. It is understood the importance and importance of biophilic design when looking at new and existing buildings, avenues, streets, parks and urban planning in modernized and developing urban environments.

The green building designs that emerged in the 1990s focused on the improvement of the environment as a result of the connection between the human potential working and the planning quality in the cities (Browning & Romm, 1994). The connection with nature arose from a study by Roger Ulrich, who had a healing effect on people. In this study, Ulrich (1984) demonstrated the difference in the healing process between patients in contact with nature and patients away from nature. In this study, stress was decreased in patients present in nature, creativity strengths were improved and a rapid increase was observed in their recovery (Ulrich, 1984). With this research, it is seen that the effect of biophilic design on people is strong.

Orr (2000), who stated that people feel better and adapt more to the environments in the places where the elements are used in nature, support the definition of Wilson (1984) that people's interest in nature is an innate trait. Biophilia design, which touches on the fact that people feel better with the elements of nature such as sunlight, relationship with animals, green fields, bird chirps, water resources, looks at the relationship between nature and human, the biological level and the design of the existing social environment. In this context, it enables us to understand the extent of the relationship between man and nature and to have an idea about the benefits of biophilia to human in the new designs to be created.

Ryan, Browning, Clancy (2014), biophilic design, human physiological and psychological as well as complementary qualitative and quantitative research have expressed clearly. With 14 patterns centered on biophilic design, it gives an opinion on the extent to which the design to be applied in the fields of architecture and interior architecture should be measured and divided into three main categories. These are; Nature in the Space, Natural Analogues, and Nature of the Space (See Table 4.4).

**Table 4.4 14 Patterns of Biophilic Design**

<b>Nature in the Space Patterns_</b> Inclusion of living things (plants, water, animals) in the environment.	<b>Natural Analogues</b> Transfer of materials such as material, color and shape to life.	<b>Nature of the Space Patterns_</b> Psychological and physical response of people to different places in nature.
<p><b>1. Visual Connection with Nature_</b> indoor and outdoor plants, green walls, water, fields, bird sounds, nature pictures</p> <p><b>2. Non-Visual Connection with Nature_</b> natural ventilation, nature sounds, nature fragrances, textured materials.</p> <p><b>3. Non-Rhythmic Sensory Stimuli_</b> cloud movements, shadows, reflections of water and sounds of nature</p> <p><b>4. Thermal &amp; Airflow Variability_</b> solar heat, shade, radian, seasonal vegetation, space orientation</p> <p><b>5. Presence of Water_</b> All water sources, fountains, water walls</p> <p><b>6. Dynamic &amp; Diffuse Light_</b> lighting, light filters, sun and moonlight</p> <p><b>7. Connection with Natural Systems_</b> seasonal pattern, wildlife, daily patterns</p>	<p><b>8. Biomorphic Forms &amp; Patterns_</b> furniture designs, wood works, wall paints, structural systems</p> <p><b>9. Material Connection with Nature_</b> structural systems, ergonomic systems, natural materials</p> <p><b>10. Complexity &amp; Order_</b> facade materials, material texture and colors, auditory and odorous stimuli, plant combination</p>	<p><b>11. Prospect_</b> Landscapes, balconies, focal lengths, transparent materials</p> <p><b>12. Refuge_</b> asylum areas, weather and climate, recreation areas, lowered ceiling</p> <p><b>13. Mystery_</b> hidden forms, transparent materials, light, shadow, sound</p> <p><b>14. Risk/Peril_</b> floor to ceiling transparent external materials, infinity sensation, water walkways</p>

(Adapted from Ryan, Browning, Clancy (2014))

### 4.3.3 Proposal Combined

When the development of biophilia in young children is examined, it is stated that the development of children is formed from the first years of birth (Moore & Marcus, 2008). Since, each child interacts with the natural environment during their development, they need to explore nature and reveal their own superiority in order to realize learning conditions in these environments (Thompson &

Thompson, 2007). According to Rivkin (1995), it is argued that children have a sense of freedom and individuality on children and enable children to set up play environments as they wish. In the same way, Chawla (2007) states that the materials and objects that exist in nature attract the attention of children, and that children reinforce their desire to be in contact with these stimuli.

It is important to impose the fact that children, as in every living thing, are part of nature, as the positive viewpoints, values and tendencies of nature begin to develop in early childhood (Kahn, 2002; Kellert, 1997). However, children cannot spend time in nature because of many reasons. The reason for this is that the damage to the natural habitats where people show their power is one of the important factors for children to break away from natural habitats. Together with the developing technology, it is one of the biggest obstacles of children to stay away from still and open spaces when they turn to electronic devices such as tablets, computers and televisions and spend time in houses.

At this point, "14 Patterns of Biophilic Design" and "Skivenes and Strandbu's Child Participation Model" provide solutions to these problems. In the class models where children are involved, the use of 14 patterns to form biophilic design is thought to develop many factors such as imagination, mind-opening, relaxation, attention-grabbing, and discovery in the classroom model in which children will spend their education.



## **CHAPTER 5**

### **THE CASE STUDY**

Bademler Village Montessori College, in the light of the system revealed by Dr. Maria Montessori, it is a school based on experiments and individual experiences, according to each child's own character. It was also chosen as a case study because it is an environment within nature and therefore has biophilic design features. It was established in Izmir in 2017 under the Ministry of Education. Detailed information about this school and the details of the workshop held with children are given in the following sections. At the same time, the general characteristics of the selected school, the general knowledge about the participant children, the techniques used during the application, the instrument designed during the workshop, the results of the workshop, the methodology and findings of the study are discussed.

#### **5.1 Setting of the Study**

Bademler Village Montessori College is one of the Montessori education centers in Izmir. This school is located in Bademler village of Urla district. It was founded by Melis Kurtel Emin observing the development of her two daughters in other learning environments where she studied in Montessori. Bademler Village Montessori College was opened in 2017-2018 academic year. Montessori Primary School consists of four blocks in eight acres. It has a closed area of 1000 square meters in total (See Figure 5.1).

The Montessori school aims to provide children with an educational system that interacts with nature, trees, animals and plants. At the same time, in the light of the system put forward by Maria Montessori, it aims a teaching system that is based on experiments and individual experiences, which is set according to the speed of each child. One of the biggest goals of the school is to provide not only academic information in school, but also the education they will take against life.

There are preschool and primary schools under the school structure. The school has 50 children in total. With a mixed education system, the classes do not differ according to age levels. In the preschool class, children from the age of two years to six years are in the same class and receive the same education according to age levels. In the preschool class, children from the age of two years to six years are in the same class and receive the same education. This system continues in the elementary school. The courses begin at 9.00 am in the course hours given by the Ministry of Education and end at 17.00 pm. There are a total of fourteen teachers including School Director, Deputy Director, four primary school class teachers, preschool teacher, three English teachers, sports and music teacher and two psychologists. Beside the classrooms, there are common areas such as playgrounds, library, music room, picture room, gym, and dining hall where they can play in the garden (See Figures 5.2 and 5.3)



**Figure 5.1** General view of the school.



**Figure 5.2** View of the existing learning environment.



**Figure 5.3** View of the existing learning environment.

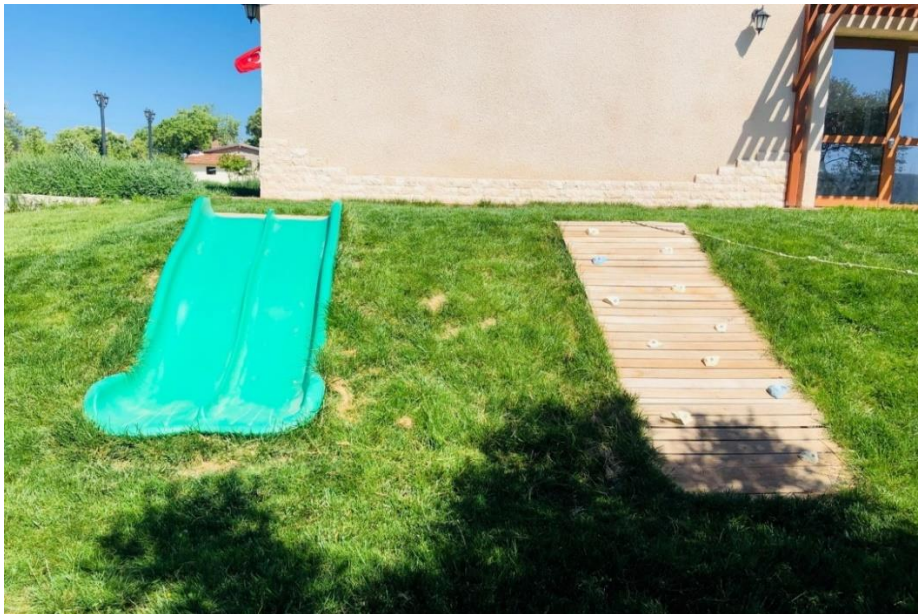


## 5.2 Sample Group

In the Izmir region, there are many private schools offering Montessori education. However, as a result of the school research, in some Montessori schools, it was observed that nature was not fully experienced by the children. The purpose of selecting the Bademler Village Montessori College is because it offers a wide range of playgrounds to the children as a result of having a large school garden, where various animals such as lambs, rabbits, peacocks, turtles can roam in nature (See Figures 5.4, 5.5, 5.6, and 5.7).



**Figure 5.4** Animals in the school.



**Figure 5.5** View from the playground in the school garden.





**Figure 5.6** View from the playground in the school garden.



**Figure 5.7** View from the playground in the school garden.

The Bademler Village Montessori College has agreed to cooperate with the study, with the full participation of children aged between two and six years. All stages of the study were carried out within the school and children were made to feel comfortable and safe within the school they were familiar with. In this way,

children were observed in their own fields and were not disturbed by any situation and participated in the workshop according to their own limits.

The children were taken in groups of three to avoid being left behind. In order not to fall back from their lessons, interviews were made with the children in the music room class, which was decided together with the school, not in their classroom environments, and questionnaires were applied, and design sheets were prepared and observations were made (See Figure 5.8).



**Figure 5.8** View of the school's music room.

A group of ten children, male and female, participated in the study. At the same time, a workshop was held under the supervision of a psychologist and classroom teachers. Before the beginning of the workshop, pre-school education children and classroom teachers were interviewed by the deputy director. After the preliminary interviews with the deputy director, a detailed discussion was held on the workshop under the supervision of the school head, the deputy director, the class teacher and the psychologist teacher, because of time constraints and the possibility that children's interests would be easily dispersed. After this meeting, it was decided that the answer to the two-year-old child would not be very clear due to the very small size of the children. Therefore, it was decided to continue working with children aged between five and six years who were

thought to have better communication. At the same time, the head of the school has taken the necessary permissions from the families. The workshop to be applied to the children was signed and written permission papers were signed by the participants who approved that the visuals and findings in the study will be used in accordance with the confidentiality principle in the study. Ten children, deputy director, class teacher and psychologist teachers participated in the study. Five and six year old children were selected from the males and females equally. In general, the time distribution of ten children with gender, age and time allocated to each children is given below (See Table 5.1).

**Table 5.1** Distribution of Participating Children

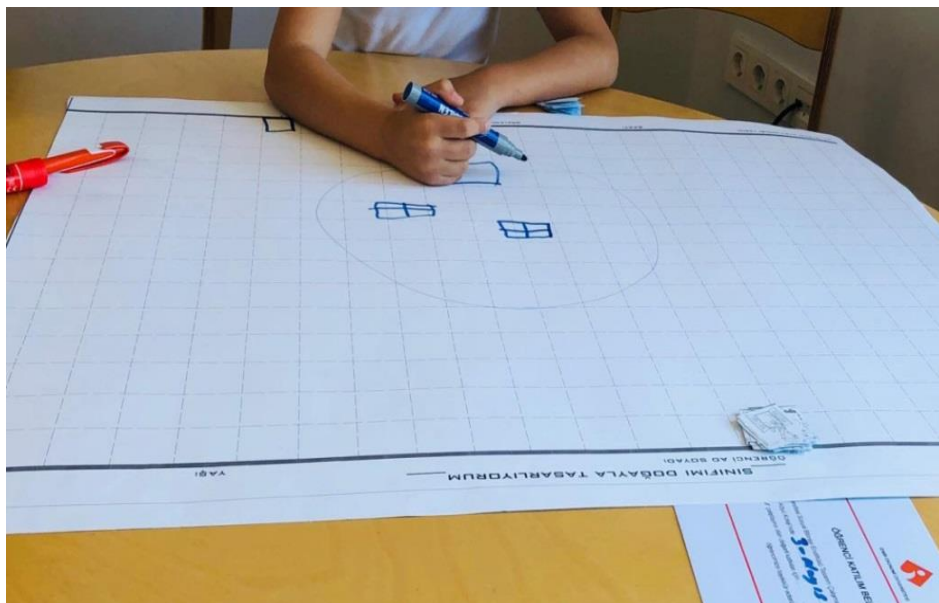
<b>CHILD</b>	<b>GENDER</b>	<b>AGE</b>	<b>START &amp; FINISH</b>
1	male	6	10:00 am_10:45 am
2	female	5	
3	male	6	
4	female	6	10:55 am_11:40 am
5	female	5	
6	male	6	
7	male	6	11:50 am_12.30 am
8	female	6	
9	female	5	
10	male	5	

### 5.3 Application

The workshop, which was held at the Bademler Village Montessori College, was organized in detail with the help of the deputy director and a workshop was held. It was decided that a period of two hours would be needed to prevent children from leaving their courses and other education programs. In this direction, the workshop was held between 10.00 am and 12.00-12.30 am. The deputy director welcomed the researcher within the school. After a one-hour interview, a suitable classroom for the workshop with children was set and prepared for the workshop. During the workshop, a camera system was installed in order to remember the children's behavior. Ten children participated in the workshop. Three tables were arranged as the children would be in groups in three groups. A questionnaire, design sheet, felt-tip pens and adhesives were placed on each table. At the same time each table was put on voice recorders. The pictures on the side of the

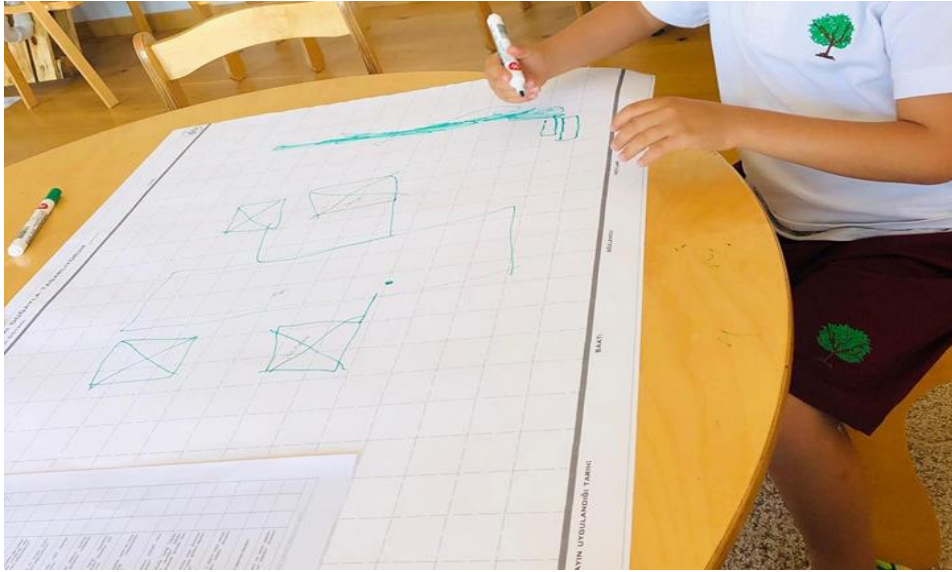
design sheet were made pre-cut in order not to waste time and cause harm to children.

At the end of the preparations, the children started to be taken into the classroom at 10.00 am. After the first group was admitted to the class, the children sat on their desks. In general, issues such as the aim of the workshop and how it would contribute to them was explained to children. According to this, first of all, they were asked to draw a class environment in general by using the felt pens on the table (See Figures 5.9 and 5.10). The walls, windows, doors in the classroom where the child wanted to position. Then, they were asked to place the pictures in the design sheets according to the answers to the questionnaire (See Figure 5.11). The answers to the questions were noted on the questionnaire and design sheet. At the same time, the child was asked questions about whether she wanted to see the current pictures, the inside of the class or the outside, and finally the child placed her paintings on the area she wanted. In this way, the workshop was completed in three groups, consisting of three children. Each group had a time of 45 minutes. When a group leaves and the other group enters the class, the preparation time for the new group is 10 minutes. After the completion of the workshop, the participants were given written participation certificates due to their participation in each child (See Figure 5.12).



**Figure 5.9** A child doing a drawing of the design sheet.





**Figure 5.10** A child doing a drawing of the design sheet.



**Figure 5.11** A view from the workshop.



**Figure 5.12** At the end of the workshop, the participation certificates given to the children.

## **5.4 Instruments**

The instruments used in the case study consist of three parts. (1) Questionnaire (3) Design Sheet and (3) Observation. In this section, each paper is explained in detail, the preparation stage, what they are prepared for and what they will do.

### **5.4.1 Questionnaire**

The questionnaire was used to collect primary data about the participating children. It was used in A4 format and was used for direct response from children. Questions were prepared based on 14 patterns of biophilia design. During the preparation of the questions, the definitions given for each section of the 14 patterns were fixed and questions were created on the children's language.

The 14 patterns of biophilic design consist of three sections. These; *Nature in the Space Patterns*, *Natural Analogues Patterns* and *Nature of the Space Patterns*. These sections are divided into sub-sections. The sub-sections of Nature in the Space Patterns; (1) Visual Connection with Nature, (2) Non-Visual Connection with Nature, (3) Non-Rhythmic Sensory Stimuli, (4) Thermal & Airflow Variability, (5) Presence of Water, (6) Dynamic & Diffuse Light, (7) Connection with Natural

Systems. The sub-section of Natural Analogues Patterns; (8) Biomorphic Forms & Patterns, (9) Material Connection with Nature, (10) Complexity & Order. The sub-section of Nature of the Space Patterns; (11) Prospect, (12) Refuge, (13) Mystery, (14) Risk/Peril. There are 14 questions in the questionnaire because there are 14 sub-sections in total and the questions are prepared according to these sections.

In questionnaire, there are areas such as the name of the school where the workshop was held, the date of observation, and the time at which it was made. In addition, the questions are divided into three sections. These are; (1) Available\_ current conditions in school and learning class, (2) Imaginary\_ how the child portrays his class in his imagination and how he wants to be, (3) Degree\_ The importance of these areas for the child. Questionnaire form is given in the appendix section is empty (See Figure 5.13 and Figure 5.14).

ÇALIŞTAY İÇİN SORULAR							
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ	GÖZLEM TARİHİ:	03.05.2018	SAATI:	10.00	HAYALİ DERECE	
ANA GRUP	DÜZEN	MEVCUT	HAYALİ		Hiç önemli değil	Bilmiyorum	Önemli
MEKÂNSAL DÜZENLERDE DOĞA	1	'Doğa ile Görsel Bağlantı' Okulundaki bahçede, sınıfta ağaçlar, bitkiler var mı? Tarif eder misin?	Hayalinde okul bahçede ve sınıfta ağaç ve bitkilerin nasıl olmasını isterdin? Bunları sınıfta görmek ister misin? Senin için ne kadar önemli?				
	2	'Doğa ile Görsel Olmayan Bağlantı' Sınıfta doğadaymış gibi sesler, dokular, renkler, kokular duyuyor musun? Tarif eder misin?	Sınıfta bu öğeleri duymak ister misin? Sınıfta hangi sesleri, dokuları, renkleri, kokuları duymak isterdin? Senin için ne kadar önemli?				
	3	'Ritmik Olmayan Duyusal Uyarılar' Doğada an vızılıtsı, kuş sesleri gibi sesler duyar mısın? Bu sesleri okulunda duyabiliyor musun? Tarif eder misin?	Kuş sesi ve an vızılıtsı gibi sesleri sınıf ortamında duymak ister misin? Bunu nasıl sağlayabiliriz? Senin için ne kadar önemli?				
	4	'Termal ve Hava Akış Değişkenliği' Okul bahçesinde havanın sıcaklığını, rüzgârının şiddetini hissediyor musun? Tarif eder misin?	Havanın sıcaklığının değişkenliğini ve rüzgârın şiddetini sınıfta hissetmek ister misin? Senin için ne kadar önemli?				
	5	'Su Varlığı' Okulunda su olanakları (çeşmeler, yapay göller, su yürüyüş yolları vb.) var mı? Tarif eder misin?	Su alanlarında nasıl oyunlar oynarsın? Sınıfta su alanları görmek ister misin? Senin için ne kadar önemli?				
	6	'Dinamik ve Yaygın Işık' Okul bahçesinde ve sınıfta güneş ışığından faydalanabiliyor musun? Tarif eder misin?	Güneş ışığının sınıfta daha çok girmesini ister misin? Sence nasıl olmalı? Senin için güneş ışığı ne kadar önemli?				
	7	'Doğal Sistemlerle Bağlantı' Okul bahçesinde ve sınıfta mevsimleri (İlkbahar, yaz, sonbahar ve kış) yaşıyor musun? Bu mevsimlerden aldığın hisler neler?	Sınıfta hangi mevsimin olmasını isterdin? (İlkbahar, yaz, sonbahar ve kış) Senin için seçtiğin mevsim ne kadar önemli?				
DOĞALI ANDIRAN DÜZENLER	8	'Biyomorfik Formlar ve Desenler' Okulunda ve sınıfta kullanılan doğal malzemelerden (ahşap) yapılmış eşyalar var mı? Sınıfta oturduğun sandalyenin, kullandığın dolabının, malzemesini seviyor musun? Tarif eder misin?	Boyle bir alanın olsaydı nasıl olmasını isterdin? Bunların olması senin için ne kadar önemli?				
	9	'Doğa ile Malzeme Bağlantısı' Sınıfta kendine ait oyun oynayabileceğin doğa ile iç içe (ağaç ev gibi) alanlar mevcut mu? Tarif eder misin?	Boyle bir alanın olsaydı nasıl olmasını isterdin? Bunların olması senin için ne kadar önemli?				
	10	'Karmaşıklık ve Düzen' Sınıfta çeşit çeşit bitkiler mevcut mu? (ağaç çeşitleri, çiçek çeşitleri gibi) Tarif eder misin?	Sence sınıfta hangi bitkiler olmalı ve sevdiğin bitkileri sınıfının içerisinde görmek ister misin ve bunlar sence ne derece önemli?				
MEKÂNSAL DÜZENLERİN DOĞASI	11	'Olasılık' Sınıftan okul bahçeni izleyebilir/ gözlemleyebilir misin? Tarif eder misin?	Sence sınıfta veya okulunun bahçesinde dışarıyı gözleyebilmen için ne yapmak gerekir? Senin için dışarıyı gözlemek ne derece önemli?				
	12	'Sığınak' Sınıfta saklanmak istediğin, merak ettiğin, mağara gibi alanlar var mı? Tarif eder misin?	Hayalinde o alanın nasıl olmasını veya başka nelerin olmasını isterdin? Senin için bu alanlar ne kadar önemli?				
	13	'Gizem' Dedektiflik gibi gizli şeyleri buluyor, ortaya çıkarıyor, keşfediyor musun? Sınıfta arkadaşlarıyla böyle oyunlar oynar mısın? Tarif eder misin?	Bu oyunları nasıl oynamayı isterdin? Senin için ne kadar önemli?				
	14	'Risk/Tehlike' Ufak korkular yaşadığın, heyecanlandığın yerler (suda, yüksekte vs.) sınıfta, okulunda mevcut mu? Tarif eder misin?	Bu alanların ne olmasını isterdin, nasıl olsun isterdin? (Survivor gibi) Senin için bu alanlar ne kadar önemli?				

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Figure 5.13 Questionnaire for Children

QUESTIONS FOR THE WORKSHOP						
SCHOOL NAME:	BADEMLER KOYÜ KOLEJİ	OBSERVATION DATE:	03.05.2018	TIME:	10.00	IMAGINARY DEGREE
MAIN GROUP	ORDER	AVAILABLE	IMAGINARY	Does not matter	Do not know	Important
NATURE IN THE SPACE PATTERNS	1	'Visual Connection with Nature'__ Do you have trees, plants in your school garden, in your classroom? Can you describe?	How would you like trees and plants in your imaginary schoolyard and classroom? You want to see this in your class? How important is it to you?			
	2	'Non- Visual Connection with Nature'__ Do you hear sounds, textures, colors, odors in your classroom as if you were in nature? Can you describe?	You want to hear these items in your classroom? What sounds, textures, colors, smells would you like to hear in your classroom? How important is it to you?			
	3	'Non-Rhythmic Sensory Stimuli'__ Do you hear sounds like bee buzz and bird sounds in nature? Can you hear these sounds at your school? Can you describe?	Would you like to hear the sounds of birds and bee buzz in the classroom? How can we achieve this? How important is it to you?			
	4	'Thermal & Airflow Variability'__ Do you feel the temperature of the air, the intensity of the wind in the schoolyard? Can you describe?	Do you want to feel the variability of air temperature and the intensity of the wind in your class? How important is it to you?			
	5	'Presence of Water'__ Does the school have water facilities (fountains, artificial lakes, water walkways, etc.)? Can you describe?	How do you play games in water fields? You want to see water fields in your class? How important is it to you?			
	6	'Dynamic & Diffuse Light'__ Can you make use of the sunshine in the schoolyard and classroom? Can you describe?	Do you want the sunlight to get into class more? How do you think it should be? How important is sunlight to you?			
	7	'Connection with Natural Systems'__ Do you experience the seasons (spring, summer, autumn and winter) in the school yard and classroom? What are your feelings from these seasons?	What season would you like to have in your class? (Spring, summer, autumn and winter) How important is the season you choose for you?			
NATURE ANALOGUES PATTERNS	8	'Biomorphic Forms & Patterns'__ Are there items made of natural materials (wood) used in school and class? Do you like the chair you use in your class, the closet you use, the stuff? Can you describe?	How would you like it if you had a field like this? How important is this to you?			
	9	'Material Connection with Nature'__ Are there spaces in your class where you can play your own game (like tree house)? Can you describe?	How would you like it if you had a field like this? How important is this to you?			
	10	'Complexity & Order'__ Are there different kinds of plants in your class? (tree varieties, flower varieties, etc.) Can you describe?	Which plants do you think should be in your class and would you like to see your favorite plants in your class and how important do you think they are?			
NATURE OF THE SPACE PATTERNS	11	'Prospect'__ Can you monitor your schoolyard from your classroom? Can you describe?	What do you think you need to do to observe outside in the classroom or in the garden of your school? How important is it for you to observe outside?			
	12	'Refuge'__ Are there any cave-like areas in your class that you'd like to hide? Can you describe?	How would you want that field to be in your imagination or what else? How important are these areas to you?			
	13	'Mystery'__ You find, uncover, discover hidden things like detective work? Do you play games like this with your classmates? Can you describe?	How would you like to play these games? How important is it to you?			
	14	'Risk-Peril'__ Are there places where you have little fears, excitement (water, high, etc.) in your classroom, school? Can you describe?	What do you want these areas to be, how do you want them? (Like Survivor) How important are these areas to you?			

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Figure 5.14 Questionnaire for Children

#### **5.4.2 Design Sheet**

The design sheet has been prepared based on 14 patterns of biophilic design like questionnaire and it is supportive of questionnaire. In Questionnaire, three main sections and three sub-sections were mentioned. The questions are described by this subsection. The questions prepared for the sub-sections in the design sheet were clarified and confirmed. It was designed as pictures so that it can attract the attention of children and visually understand them. Each picture corresponds to the headings in the lower sections of the 14 patterns. The design sheet was prepared in A1 format and was left empty without any restriction in order to determine the child's own space. The square shapes that appear on the paper are left to make drawing easier and to place the pictures. On the design sheet, there are areas where the workshop can specify the name of the school, the name of the children, the date, the time and the observation of the workshop.

There are 3 main headings in the design sheet. Each of these headings was evaluated for each child. An example of how the design sheet works, trees are mentioned in Visual Connection with Nature, one of the sub-headings of Nature in the Space Patterns. The questionnaire part of the question whether these trees are present in the school are asked. S/he was also asked if s/he wanted to see a tree in her dream class. In contrast, a tree figure was used in the design sheet. In this way, if the child wants to see the tree in the class model s/he had drawn during the workshop, s/he placed the tree in the interior of his class. If s/he wants to see the tree in the garden, he has affixed the tree outside the boundary. In this way, the child decides whether he wants to place this tree inside or out of the class model s/he has drawn. If the class s/he draws the tree into the space, it is concluded that the class wants to see greenery and the greenness in its class is incomplete. The results of the questionnaire are supported in this way. The design sheet is given figure 5.15 and figure 5.16.


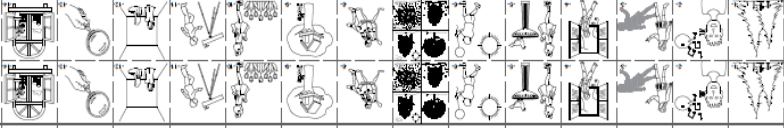
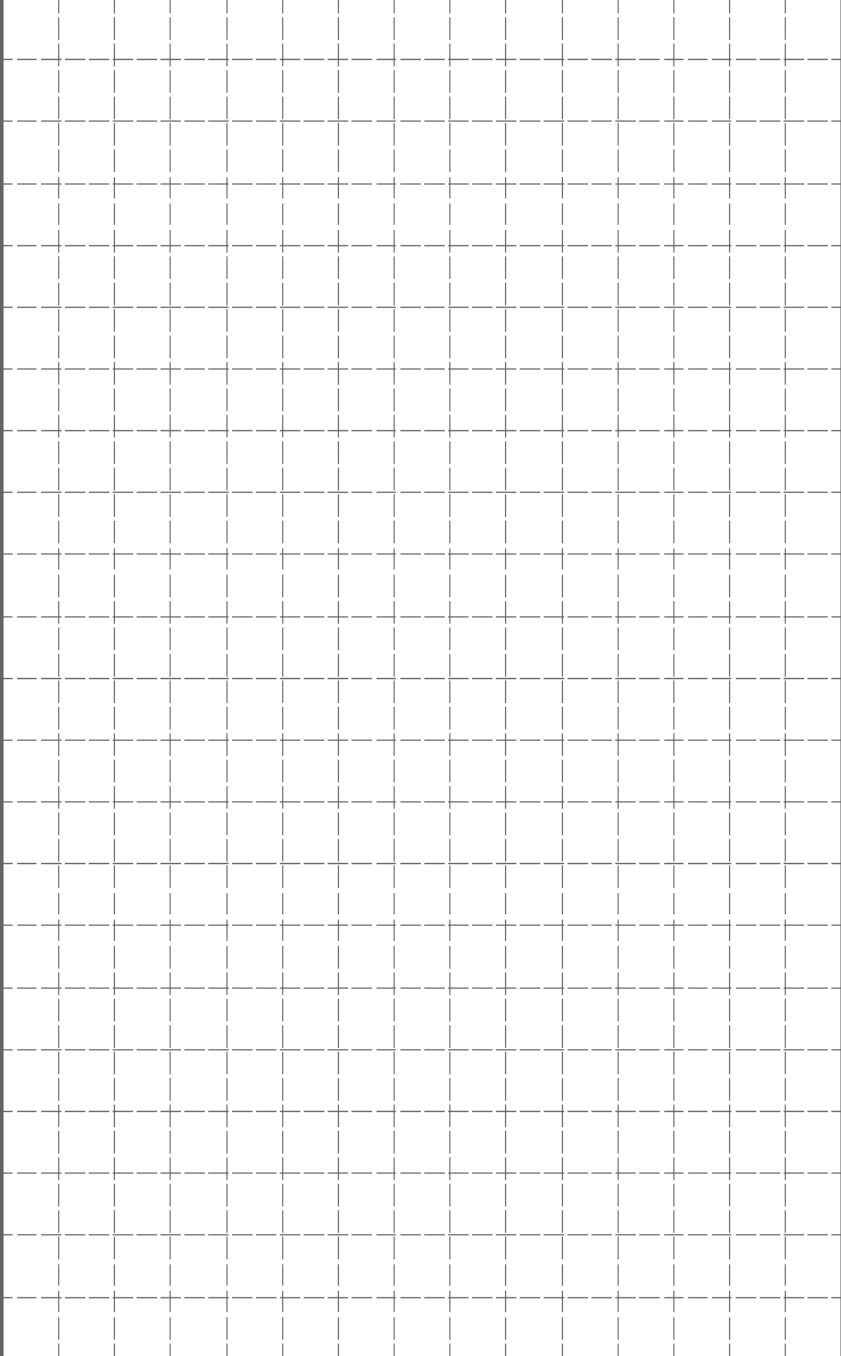
	OKULUN ADI: BADEMLER KÖYÜ KOLEJİ SINIFIMI DOĞAYLA TASARLIYORUM ÖĞRENCİ AD SOYAD: _____ YAŞ: _____												
		<div style="display: flex; justify-content: space-between; padding: 5px;"> <span>ŞALİŞTAYIN UYULANINDIĞI TARİH:</span> <span>ŞEMAN:</span> <span>GÖZLENDİ:</span> <span>NOTLAR:</span> </div>											
													

Figure 5.15 Design Sheet for Children



**DESIGN MY CLASS WITH NATURE**

SCHOOL NAME: BADEMLER KÖYÜ KOLEJİ

STUDENT NAME SURNAME: \_\_\_\_\_


AGE: \_\_\_\_\_

DATE OF WORKSHOP: \_\_\_\_\_

TIME: \_\_\_\_\_

OBSERVER: \_\_\_\_\_

NOTES: \_\_\_\_\_



**Figure 5.16** Design Sheet for Children



### **5.4.3 Observation**

The main purpose of the observation sheets, which consists of two styles of content, is designed to express the observations of the workshop. As in questionnaire and design sheet, the sections of the 14 design of the biophilic design were used in the observation part. The extent to which these departments are present in their learning environments is graded as a result of observations of the workshop person. Observation paper has three main sections and fourteen sub-sections. The extent to which each sub-section exists in the current school is stated. At the same time, the field was created in order to take notes beside the observer. You can see the empty form of the first observation form in figure 5.15.

The second observation sheet is designed for the workshop person to describe the field discoveries within and outside the school in sketches. You can see the empty form of the second observation form in figure 5.17, 5.18, 5.19, 5.20, 5.21, 5.22, 5.23, 5.24).

14 BİYOFİLİK TASARIM ÖGELERİ TASARIMCIDAN KAYNAK FORMU									
OKUL ADI:	ANA GRUP	DERECE ADIM AÇIKLAMA	GÖZLEM TARİHİ:					Açıklama	
			çok az	az	orta	iyi	çok iyi		
			1	2	3	4	5		
MEKÂNSAL DÜZENLERDE DOĞA	1	Doğa ile Görsel Bağlantı							
	2	Doğa ile Görsel Olmayan Bağlantı							
	3	Ritmik Olmayan Duyusal Uyarılar							
	4	Termal ve Hava Akış Değişkenliği							
	5	Su Varlığı							
	6	Dinamik ve Yaygın Işık							
	7	Doğal Sistemlerle Bağlantı							
DOĞALI ANDIRAN DÜZENLER	8	Biyomorfik Formlar ve Desenler							
	9	Doğa ile Malzeme Bağlantısı							
	10	Karmaşıklık ve Düzen							
MEKÂNSAL DÜZENLERİN DOĞASI	11	Olasılık							
	12	Sığınak							
	13	Gizem							
	14	Risk/Tehlike							

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sayfa\_01/04

Figure 5.17 Observation form: This form is to be used by the designer.


14 PATTERNS OF BIOPHILIC DESIGN OBSERVATION SHEET BY DESIGNERS										
SCHOOL NAME:		OBSERVATION DATE:					OBSERVATION DATE:			Description
MAIN GROUP		DEGREE	poor	fair	average	good	very good			
STEP:	DEGREE	STEP DESCRIPTION	1	2	3	4	5			
1	Visual Connection with Nature	Visual Connection with Nature								
2	Non-Visual Connection with Nature	Non-Visual Connection with Nature								
3	Non-Rhythmic Sensory Stimuli	Non-Rhythmic Sensory Stimuli								
4	Thermal & Airflow Variability	Thermal & Airflow Variability								
5	Presence of Water	Presence of Water								
6	Dynamic & Diffuse Light	Dynamic & Diffuse Light								
7	Connection with Natural Systems	Connection with Natural Systems								
8	Biomorphic Forms & Patterns	Biomorphic Forms & Patterns								
9	Material Connection with Nature	Material Connection with Nature								
10	Complexity & Order	Complexity & Order								
11	Prospect	Prospect								
12	Refuge	Refuge								
13	Mystery	Mystery								
14	Risk/Peril	Risk/Peril								
NATURE IN THE SPACE PATTERNS										
NATURAL ANALOGUES PATTERNS										
NATURE OF THE SPACE PATTERNS										

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Figure 5.18 Observation form: This form is to be used by the designer.

14 BİYOFİLİK TASARIM ÖĞELERİ_TASARIMCIDAN KAYNAK FORMU			
OKUL ADI:			GÖZLEM TARİHİ:
ANA GRUP	ADIMLAR	ADIM AÇIKLAMASI	ESKİZLER
 <b>MEKÂNSAL DÜZENLERDE DOĞA</b>	1	Doğa ile Görsel Bağlantı	
	2	Doğa ile Görsel Olmayan Bağlantı	
	3	Ritmik Olmayan Duyusal Uyarılar	
	4	Termal ve Hava Akış Değişkenliği	
	5	Su Varlığı	
	6	Dinamik ve Yaygın Işık	
	7	Doğal Sistemlerle Bağlantı	
İZMİR EKONOMİ ÜNİVERSİTESİ_ Gülferm ERGÜNEŞ KÜTÜK SOSYAL BİLİMLER ENSTİTÜSÜ_TASARIM ÇALIŞMALARI YÜKSEK LİSANS PROGRAMI (2019) sayfa_02/04			

**Figure 5.19** Observation Sketch Form: This form is to be used by the designer.


14 BİYOFİLİK TASARIM ÖĞELERİ_TASARIMCIDAN KAYNAK FORMU			
OKUL ADI:			GÖZLEM TARİHİ:
ANA GRUP	ADIMLAR	ADIM AÇIKLAMASI	ESKİZLER
 <b>DOĞALI ANDIRAN DÜZENLER</b>	8	Biyomorfik Formlar ve Desenler	
	9	Doğa ile Malzeme Bağlantısı	
	10	Karmaşıklık ve Düzen	
İZMİR EKONOMİ ÜNİVERSİTESİ_ Gülferm ERGÜNEŞ KÜTÜK SOSYAL BİLİMLER ENSTİTÜSÜ_TASARIM ÇALIŞMALARI YÜKSEK LİSANS PROGRAMI (2019) sayfa_03/04			

**Figure 5.20** Observation Sketch Form: This form is to be used by the designer.


14 BİYOFİLİK TASARIM ÖĞELERİ_TASARIMCIDAN KAYNAK FORMU			
OKUL ADI:			GÖZLEM TARİHİ:
ANA GRUP	ADIMLAR	ADIM AÇIKLAMASI	ESKİZLER
 <b>MEKÂNSAL DÜZENLERİN DOĞASI</b>	11	Olasılık	
	12	Sığınak	
	13	Gizem	
	14	Risk/Tehlike	

İZMİR EKONOMİ ÜNİVERSİTESİ\_ Gülferm ERGÜNEŞ KÜTÜK  
SOSYAL BİLİMLER ENSTİTÜSÜ\_TASARIM ÇALIŞMALARI YÜKSEK LİSANS PROGRAMI (2019) sayfa\_04/04

**Figure 5.21** Observation Sketch Form: This form is to be used by the designer.


14 PATTERNS OF BIOPHILIC DESIGN_SKETCH SHEET BY DESIGNER			
SCHOOL NAME:		OBSERVATION DATE:	
MAIN GROUP	STEP#	STEP DESCRIPTION	SKETCHES
 <b>NATURE IN THE SPACE PATTERNS</b>	1	Visual Connection with Nature	
	2	Non-Visual Connection with Nature	
	3	Non-Rhythmic Sensory Stimuli	
	4	Thermal & Airflow Variability	
	5	Presence of Water	
	6	Dynamic & Diffuse Light	
	7	Connection with Natural Systems	
IZMIR UNIVERSITY OF ECONOMICS_ Gülferm ERGÜNEŞ KÜTÜK INSTITUTE OF SOCIAL SCIENCES_ DESIGN STUDIES MASTER'S PROGRAM (2019)			page_02/04

**Figure 5.22** Observation Sketch Form: This form is to be used by the designer.

14 PATTERNS OF BIOPHILIC DESIGN_SKETCH SHEET BY DESIGNER			
SCHOOL NAME:		OBSERVATION DATE:	
MAIN GROUP	STEP #	STEP DESCRIPTION	SKETCHES
 NATURAL ANALOGUES PATTERNS	8	Biomorphic Forms & Patterns	
	9	Material Connection with Nature	
	10	Complexity & Order	
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**Figure 5.23** Observation Sketch Form: This form is to be used by the designer.



14 PATTERNS OF BIOPHILIC DESIGN_SKETCH SHEET BY DESIGNER			
SCHOOL NAME:		OBSERVATION DATE:	
MAIN GROUP	STEP#	STEP DESCRIPTION	SKETCHES
 NATURE OF THE SPACE PATTERNS	11	Prospect	
	12	Refuge	
	13	Mystery	
	14	Risk/Peril	
IZMIR UNIVERSITY OF ECONOMICS_ Gülferm ERGÜNEŞ KÜTÜK INSTITUTE OF SOCIAL SCIENCES_ DESIGN STUDIES MASTER'S PROGRAM (2019)			page_04/04

**Figure 5.24** Observation Sketch Form: This form is to be used by the designer.

## 5.5 Findings

This study focuses on views of children in preschool education on their classrooms in their learning environments and whether their views involve natural aspects of the learning environment through a participatory design process. In other words, the importance of biophilic participatory approaches in the design of preschool learning environments is emphasized. The results of the information received from each participant child are given in detail in line with the workshop held in this section, and the answers received by emphasizing the 14 patterns of biophilic design approach are evaluated through these sub-patterns. In this section, which includes all the participants, the information received from the children is explained in detail. At the same time, the results of questionnaires, observations, interviews, feedback, and evaluations were shared with the children.

### 5.5.1 Child 1

Child 1 was a five-year-old boy. He was a mobile and intelligent boy who responded to every question asked very carefully.

#### 5.5.1.1 Questionnaire

##### *Nature in the Space Patterns:*

When we look at the answers given by Child 1, it is understood that Nature in the Space Patterns is available in schools. At the same time, the child's desire to see these existing parts in his imaginary learning environment may lead us to conclude that he felt less in Nature in the Space Patterns. He also stated that there are no water areas in his school and that the sun and wind are quite high. He stated that he wanted to see the wind and water areas in the learning environment, that there should be green spaces in the classroom environment and these areas were important for him. The reason for the high wind and the sun is due to the fact that the school is in an open land. The fact that the trees inside the school did not grow up sufficiently, the lack of high buildings around the school building, may have caused the sun and wind to feel more. He also said that the sun inside the learning environment was enough for him. In other words, the child does not want to have more windows in his learning environment when he feels himself in a bright and spacious environment. Some answers given by Child 1 to this section are as follows;

- He loves trees because of the rain and he wants the trees in his imaginary learning environment for expressing his favorite color,

- He hears bird sounds in his school, and in his imaginary learning environment he wants birds placed in a bird cage,
- He feels the wind in the schoolyard and wants to feel the wind in his imaginary learning environment,
- He lives the seasons in the garden at her school and he wants to see all the seasons in his imaginary learning environment.

*Natural Analogues Patterns:*

Looking at his answers, the idea that Natural Analogues Patterns is not available in their schools arises. Limited expressions are used on how this feature should be in the learning environment. However, the child especially wants the use of wood material and plants in the learning environment. That is why he wants to see Natural Analogues Patterns in his imaginary learning environment. Some of the answers are as follows;

- He says that his table and chairs are made of wood in his learning environment, and he wants them all to be made of wood in her imaginary learning environment,
- He says that there are no varieties of plants in his class, these plants are in the garden and he wants to see the plants in his imaginary learning environment.

*Nature of the Space Patterns:*

In the answers given by Child 1, certain lacks were identified. Nature of the Space Patterns was not available in the school. At the same time, in his imaginary learning class he states that there may be fear and anxiety in the case of these characteristics. However, he wants these features to be in part in his learning environment. Therefore, it can be concluded that he wanted to see Nature of the Space Patterns in his imaginary learning environment. In addition, Child 1 emphasized the size of the schoolyard and safety rules. He also wanted to see the garden as in his current class when he looks at his imaginary learning environment. In his imaginary learning environment, he wanted to have playgrounds for this feature and to see the animals he loves in the garden. Some of the answers to this part are;

- He has places in his learning environment that he wants to hide. However, it is not stored in unsafe places.

- He does not know if she has small fears in school, but the garden is huge. If we leave our teachers, we will be lost. And he is afraid to play these games.

The form of the questionnaire, in which Child 1 answers for biophilia design, is included in figure 5.25.



ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.1_ERKEK_6 YAŞ							
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:	10.00	HAYALİ DERECE
ANA GRUP	DÜZEN	MEVCUT	HAYALİ	Hiç önemli değil	Bilmiyorum	Önemli	
İZMİR EKONOMİ ÜNİVERSİTESİ	MEKÂNSAL DÜZENLERDE DOĞA	1	Doğaya güzellik verdiği için ve yağmur yaptığı için seviyorum.	Evet isterim. En sevdiğim renk.			✓
		2	Hayır.	Evet, sınıfımızda bahçemiz gibi yeşil olsun.			✓
		3	Evet duyuyorum. Kuşlar cik cik cik yapıyorlar. (el hareketleri ile koşturarak tarif ediyor)	Evet isterim. Kuş kafeslerini sınıfa koyabiliriz.		✓	
		4	Bazen. Rüzgâr fazla oluyor. Her şey uçuyor.	Evet.			✓
		5	Hayır yok.	Yuvarlak kapsül sular var. İçinden karakter çıkıyor. Renk değiştiren sular var.			✓
		6	Dışarıda daha çok güneş var.	Sınıfta ışık yeterli.			✓
		7	Evet. Yağmur yağarsa kış, güneş çok olursa yaz olur. Yazın denize girerim.	Hepsi, bütün mevsimler olsun.			✓
	DOĞALI ANDIRAN DÜZENLER	8	Sınıfta masalar ve sandalyeler tahtadan.	Hepsi tahtadan olsun.			✓
		9	Aaa kuş ev (Resmi gördüğündeki tepkisi). İmmm bilmiyorum. (cevap yok)	Şöyle kayabileceğim (vücut dili ile gösteriyor), dönen merdiven gibi, hareket ettirebileceğim bir şey.			✓
		10	Bahçede var ama sınıfta yok.	Evet isterdim.			✓
	MEKÂNSAL DÜZENLERİN DOĞASI	11	Camdan bakarak görüyorum.	İnekleri görmek isterdim.			✓
		12	Güvende olmayan yerlerde saklanılmaz.	Görünmez olmayı isterdim.			✓
		13	Evet.	İsterim.			✓
		14	Bahçe çok büyük. Öğretmenlerimizin yanından ayrılırsak kayboluruz.	Bu oyunları oynamaktan korkuyor.			✓

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Figure 5.25 Questionnaire Answer for Child 1

#### 5.5.1.2 Design Sheet

In the class model drawn by Child 1 on the design sheet, it is observed that the walls clearly separated his learning environment from the garden. He emphasizes the need for many windows in the learning environment. In the design sheet and questionnaire, the child said that it would enter the learning environment through the windows because the sun was more outdoors. According to Child 1, daylight is sufficient in the current learning environment. That's why he wants the light of day to be the same in his imaginary learning environment. He said that light was not enough to have more windows. He said that he wanted to see the trees he expressed in the questionnaire in the learning environment. The supporting tree picture is placed in the learning environment. At the same time in the questionnaire expressed in the learning environment to feel the wind, to see the water areas, to use the wood in class items and to see the plants in the learning environment the pictures placed on the design paper support each other. In addition, Child 1 stated the Nature of the Space Patterns in the questionnaire with concern and fear, but stated that he would like to see it partially in the learning environment setting. When we look at the Child 1 design paper, we see that this area places its pictures in the learning environment. When we look at the design paper like Child 1's questionnaire, Nature Analogue Patterns, Nature Analogues Patterns and Nature of the Space Patterns have stated that they want to feel. The design paper with the drawing for Child 1 biophilia design is located in figure 5.26.

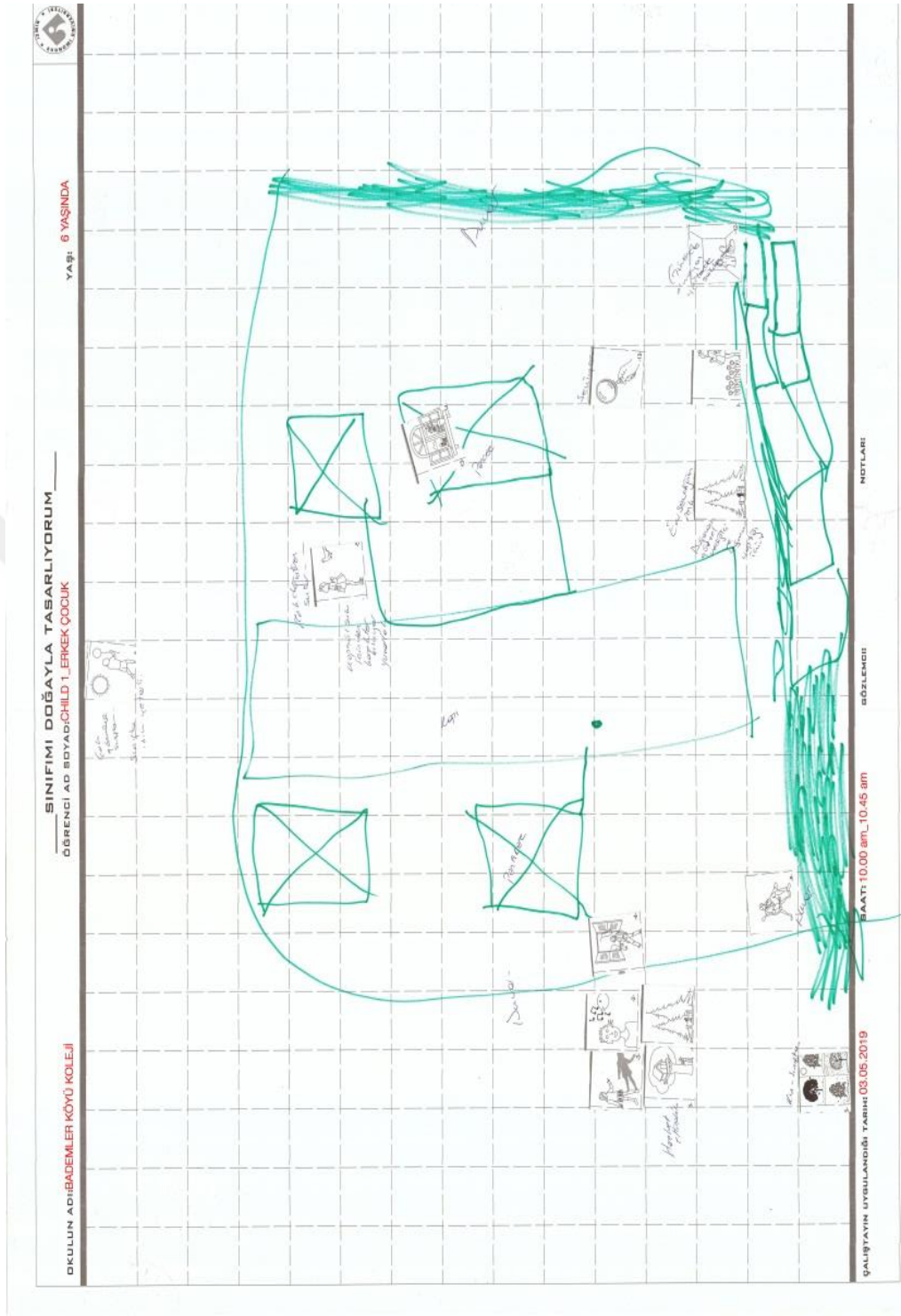


Figure 5.26 Design Sheet of Child 1

## 5.5.2 Child 2

She is an introvert, a little shy girl, six years old.

### 5.5.2.1 Questionnaire

#### *Nature in the Space Patterns:*

Child 2, in his opinion on Nature in the Space Patterns, stated that this feature is present in schools and learning environment. For this purpose, she wanted the learning environment walls to be green, then he thinks her learning environment will be like a garden. She wanted the window to be the roof of her imaginary learning environment. In this way, she said that the sun will enter from there and her learning environment will be brighter. She said that he loved the seasons summer and winter. She wanted her to have these two seasons in her imaginary learning environment. In the summer, she wanted learning environment windows open. In this way, she felt that the smell in nature can feel in her learning. When we look at the answers given, it is concluded that the child wants to see this feature in his imaginary learning environment as well as in his available learning environment. Some of the expressions Child 1 used for this feature are as follows;

- There are many gardens in the garden in her school. There are trees but the trees are small. She wants to have trees and plants in her imaginary learning environment. They smell good.
- She did not know if she has heard sounds, colors, smells in her class like in the nature, but in her imaginary class, she wanted the walls of her class to be as green as her school yard.
- She felt the warmth of the air and the intensity of the wind in the schoolyard. She gets fresh air when she feels the air. She wanted to feel the air when the window is open in her imaginary learning environment.
- She uses sunlight in her school yard and learning environment. We are going out to play with the sun. In her imaginary learning environment, she wanted the sun to get through the roof.
- She lives the seasons in the learning environment and garden of the school. She wanted it to be in summer and winter in her imaginary learning environment.



#### *Natural Analogues Patterns:*

Child 2 Natural Analogues Patterns have stated that the feature is very little in schools. Based on the answers given by Child 2 about how this feature should be in the learning environment, there were a few issues to be considered. One of them was that class tools and equipment were to be made of wood. At the same time in the learning environment to see plants and flowers. She stated that she especially wanted to see the rose from the flowers in her learning environment. For this reason, Child 2 wants to see this feature in her imaginary learning environment. Some of the answers given by Child 2 to this feature are as follows;


- All items in her class are made of wood, in the same way she would like to have all the items made of wood in her imaginary learning environment.
- Plants do not exist in her class. But the teacher once brought flowers to the classroom, but the flower died later. However, she would like to see flowers in her imaginary learning environment. Especially rose flowers.

#### *Nature of the Space Patterns:*

Child 2 thought that this feature was available in the school. She wanted this feature to be in the learning environment. Child 2, just like Child 1 responded to this feature during the workshop, but it appeared to have fear and anxiety. Some of the terms used by Child 2 for this feature are as follows;

- There are areas she wanted to hide from her learning environment. She hid under the table. She did not know how this field should be in her imaginary learning environment.
- She did not know if she liked to reveal secret things like detective. If she was playing this game in her imagination, she would hide what she wanted to keep in the closet.
- She had few a few causes for fear in her school. She was particularly scared of rain and snakes. In her imagination, she would like these areas to be like the game, "Survivor" on television.

When the total of the answers given by Child 2 to the questionnaire is seen, it is seen that this child has a strong relation with nature. The fact that she wanted to see some natural elements in the learning environment as she knows most of the elements in nature shows that the child wants to spend a comfortable, peaceful and fun time in the learning environment. The questionnaire form, which contains answers to Child 2 biophilia design, is included in figure 5.27.

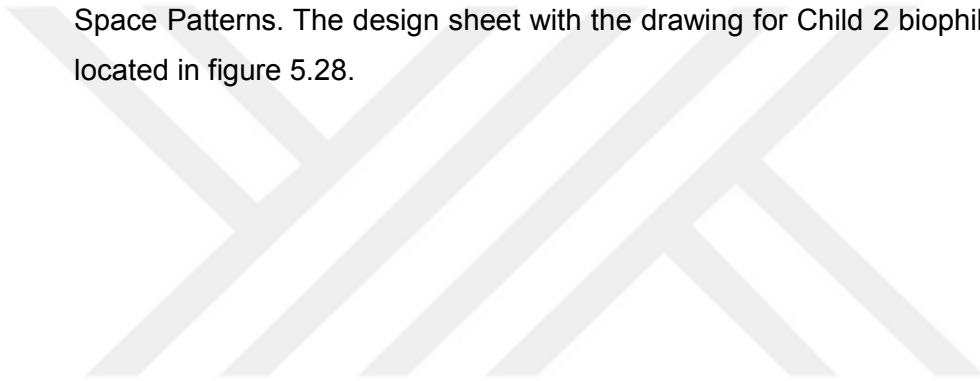
ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.2_KIZ_5 YAŞ							
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:		HAYALİ DERECE
ANA GRUP	DÜZEN	MEVCUT	HAYALİ	Hiç önemli değil	Bilmiyorum	Önemli	
	MEKÂNSAL DÜZENLERDE DOĞA	1	Evet, çok bahçe var. Ağaç var ama ağaçlar küçük.	Evet isterim. Onlar güzel kokuyor.			✓
		2	Bilmiyorum.	Duvarlar yeşil olursa bahçe gibi olur.		✓	
		3	Bazen duyuyorum.	Evimizde kuş var. Sınıfta da olabilir.			✓
		4	Evet, havayı hissedince temiz hava alırsın.	Evet, pencere açık olursa hissediyorum.			✓
		5	Yok. Ama okulun biraz dışında var.	Yazın havuza girerim.			✓
		6	Evet, güneş varken bahçeye çıkıyoruz.	Çatıdan güneş girmeli.		✓	
		7	Evet.	Yaz ve kış. Kışın çünkü kar var. Karı çok seviyorum.			✓
	DOĞALI ANDIRAN DÜZENLER	8	<u>Ahşaptan.</u>	Hepsi tahtadan.		✓	
		9	Bahçede var.	Bilmiyorum.		✓	
		10	Bir kere öğretmen sınıfa çiçek getirdi ama sonra öldü.	Gül olsun isterdim.			✓
	MEKÂNSAL DÜZENLERİN DOĞASI	11	Evet.	Bilmiyorum.		✓	
		12	Masanın altına.	Bilmiyorum.			✓
		13	Bilmiyorum.	Dolabın içine koyar saklardım.		✓	
		14	Yağmurdan ve yilandan korkuyorum.	Televizyondaki gibi.	✓		

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Figure 5.27 Questionnaire Answer for Child 2

#### 5.5.2.2 Design Sheet

When the pictures and drawings were analyzed based on the design sheet of Child 2, we see that the windows and walls are separated from each other. Child 2 stated in the questionnaire form that the air wanted to enter the learning environment. With his drawing, he said that the air would enter the learning environment better. At the same time in the learning environment model she has drawn, she emphasized that she wants the sun to enter from the roof thanks to the window she has added to the roof. In the questionnaire, Child 2, who wants to see the class walls as green as in the garden, affixed the picture of the tree to close the wall. When we look at the design sheet like Child 1's questionnaire form, she wants to feel Nature in the Space Patterns and Natural Analogues Patterns. However, she mention of her abstention and fear about Nature of the Space Patterns. The design sheet with the drawing for Child 2 biophilia design is located in figure 5.28.



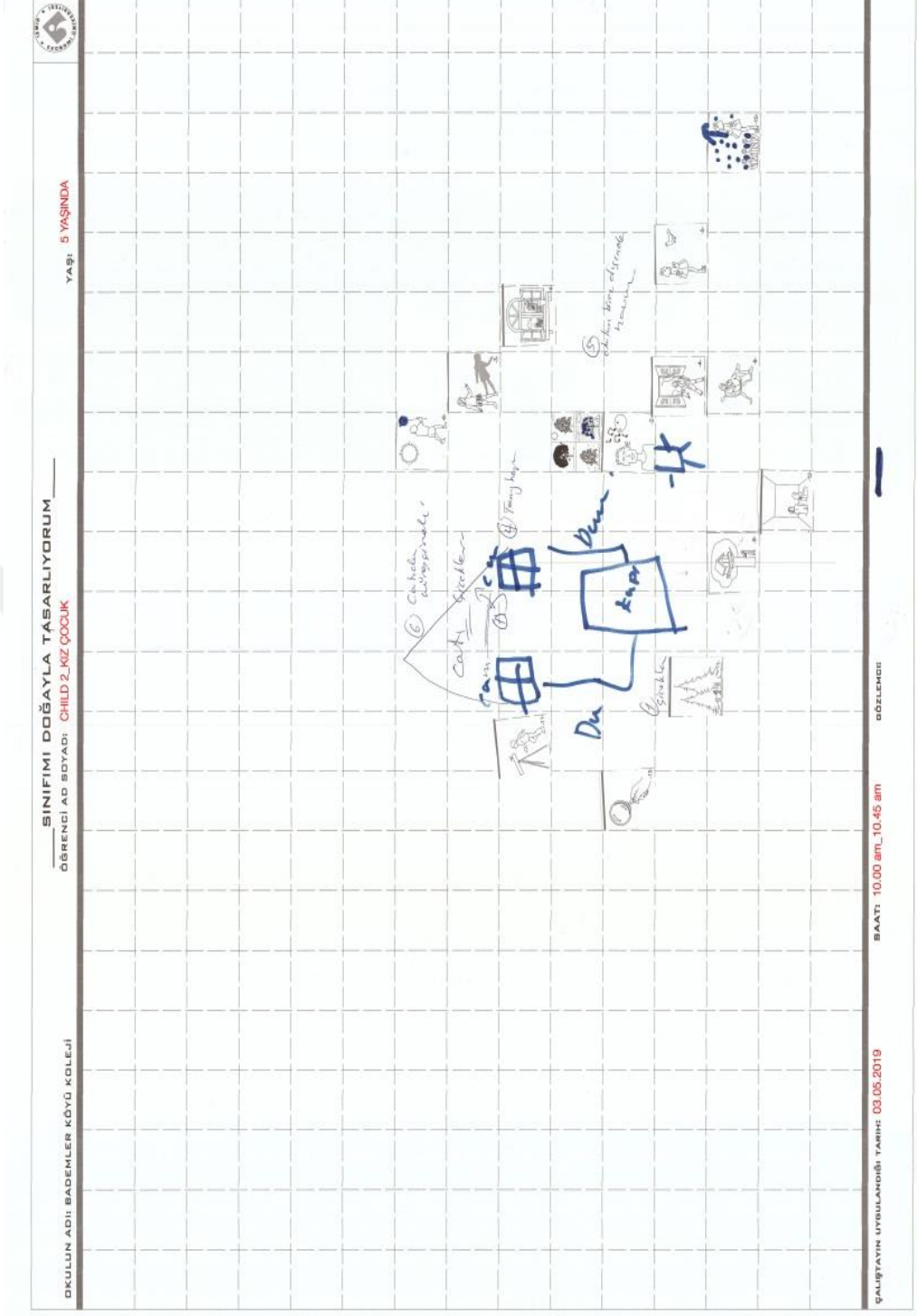


Figure 5.28 Design Sheet of Child 2

### 5.5.3 Child 3

He was a six-year-old calm boy who gave a reasonable answer to the questions.

#### 5.5.3.1 Questionnaire

##### *Nature in the Space Patterns:*

When the views of participant Child 3's biophilic design on Nature in the Space Patterns is observed, it is generally understood that this feature is available in schools and learning environment. He wanted the sub-patterns of this property to be in the learning environment. He wanted flowers, daisies, bird sounds in her imaginary learning environment. At the same time, he also wanted every learning environment to have a different color. He stated that he liked the season of summer. He did not want to have animals such as birds and dogs in his imaginary learning environment. He also stated that the sun is sufficient in its learning environment. However, in his imaginary learning class, he asked for the sun to enter through the roof. When we look at these statements, it is understood that Child 3 wanted to see this feature in his imaginary learning environment. Some expressions of Child 3 related to this feature are as follows;

- The question of whether there are trees and plants in the garden in his school, he said to be grasses. However, he said that he liked daisies better. He also wanted to see daisies in his imaginary learning environment and school garden.
- He hears sounds and smells like windows in his learning environment when the windows are open. In his dream, he wants every learning environment to have a different color.
- He hears sounds in his learning environment because there are birds and dogs in the garden. He did not want them in his imaginary learning environment because there are not to be birds and dogs in the learning environment.
- He felt the warmth of the air and the wind in the school yard. He wanted the wind in his learning environment to get through the roof.
- He can benefit from sunlight in his classroom and garden. He did not think there is sun in his imaginary learning environment, but he wants some places to have shaded and some places sunny.
- He lived the seasons at his school. He wanted to see summer in his imaginary learning environment because in the summer he is playing the game and is going into the sea.

#### *Natural Analogues Patterns:*

According to Child 3, it is concluded that this feature is present in school and learning environment. He commented on how this feature should be in the classroom of his dream. For example, in his imaginary learning environment he wanted the furniture and equipment to be made of metal. The reason is that it also thinks it will be solid. He also wants plants to be in his imaginary learning environment. However, he stated that the playgrounds should be in the garden and not in the learning environment. With these words, the child stated that he wanted this feature to be in his imaginary learning environment. Here are some statements for this feature;

- There are materials made from wood in his school and learning environment. For example, doors and windows are made of wood, but the entrance gate of the school is made of iron. In his imaginary learning environment he wants all of the things to be made of iron because it's more solid than wood.
- There are areas where he can play his own games in the garden of his school. He would not want playgrounds in his imaginary learning environment because there should not be games in the learning environment.
- Plants do not exist in his class, only rows and toys. He would love plants in his imaginary learning environment, he said it would be nice.

#### *Nature of the Space Patterns:*

It is seen that this feature exists in the school and learning environment. As this feature is in the school, it does not carry fear and anxiety as in Child 1 and Child 2. In fact, he likes to play exciting and risky games. He wanted this feature in his imaginary learning environment. He wanted the learning environment not to be dark, so there are many windows. He also wants to have spaces in which he can store in the learning environment and objects he can store. In particular, he expressed that he wanted to see the playgrounds that will give the excitement in the learning environment of his imaginary. Some of Child 3's statements about this feature are as follows;

- He saw the school yard from his learning environment. Sometimes sheep pass. He wanted to have so many windows in his imaginary learning environment.
- He has fields in his class that he wants to hide. Sometimes he is hiding behind the table. He sometimes hid behind the trees in the garden. He did not know how to be in his imaginary learning environment.
- He did not have small fears in his school or class. He is not afraid of anything. He is just scared of the cobra. In his imaginary learning environment, he would like to have some games where he can do racing games like on TV.

A questionnaire form containing the statements of Child 3 biophilic design is given in figure 5.29.



ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.3_ERKEK_6 YAŞ							
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:		HAYALİ DERECE
ANA GRUP	DÜZEN	MEVCUT	HAYALİ	Hiç önemli değil	Bilmiyorum	Önemli	
İZMİR EKONOMİ ÜNİVERSİTESİ	MEKÂNSAL DÜZENLERDE DOĞA	1	Çimenler var. Ama ben papatyayı seviyorum.	Bahçede ve sınıfta papatyalar olsun.			✓
		2	Camlar kapalı. Açık olduğunda duyuyorum.	Her sınıf farklı renkte olsun.			✓
		3	Bahçede kuş var bide köpek var.	Sınıfta kuş ve köpek olmaz.	✓		
		4	Evet.	Evet, çatıdan girsin.			✓
		5	Burada yok ama yaz evimizde var.	Lego oyunu oynarım.			✓
		6	Evet.	Sınıfta güneş yok ama karanlık değil. Bazı yerler güneşli bazı yerler gölgeli.			✓
		7	Evet.	Yaz daha güzel. Yazın oyun oynarız, denize gireriz daha güzel.			✓
	DOĞALI ANDIRAN DÜZENLER	8	Kapılar ve pencereler ağaçtan yapılmış. Ama okulun giriş kapısı demirden.	Demirden olsun daha sağlam.		✓	
		9	Bahçede var.	Sınıfta oyun oynanmaz. Dışarıda oynanır.	✓		
		10	Sıralar ve oyuncaklar var. Çiçek yok.	İsterdim. Güzel olurdu		✓	
	MEKÂNSAL DÜZENLERİN DOĞASI	11	Görüyorum. Koyunlar geçiyor bazen.	Çok pencere olmalı.			✓
		12	Ağaçların arkasına ve masanın altına saklanıyorum.	İmmm. Bilmiyorum.			✓
		13	Dedektiflik neydi? Hı evet.	Dolabın içine saklarım. Çiçeklerin arasına saklarım.		✓	
		14	Hiç birinden korkmuyorum. Kobradan korkuyorum.	Yarış oyunları televizyondaki gibi.		✓	

Figure 5.29 Questionnaire Answer for Child 3



### 5.5.3.2 Design Sheet

When the design sheet of Child 3 is observed, it is seen that some of the answers given to the questionnaire form were pasted with supporting pictures. He did not draw the walls very clearly in the learning environment model he drew the Child 3 design sheet. That is why he did not want a limit between his imaginary learning environment and the schoolyard. From this it can be concluded that in his imaginary learning environment, he wanted to see the birds sounds, plants and trees that exist in nature. In the design sheet, he placed the windows in a very dispersed area. This may lead to the conclusion that in the learning environment of his imagination the window does not have to be in a certain order, as in the current learning environment. He also stated in his drawing that these windows could be placed on the roof as he said in the questionnaire, rather than on the walls. In the questionnaire, Child 3 wants to have playgrounds in the garden. In the same way the design sheet supports this feature with the image it pasted. Questionnaire form when describing the imaginary learning environment he wants the plants in the learning environment. However, this does not match according to the image on the design sheet. Child 3 said he wanted to play games he was excited about in the questionnaire form. He supported this by having his picture sticking to the imaginary learning environment into this sub-title. He wants more windows in his imaginary learning environment. In this way, the school will observe the garden better than the learning environment. He expressed this in his learning environment model. From the design sheet, one can conclude that in the questionnaire form the wish is to see Nature in the Space Patterns, Natural Analogues Patterns and Nature of the Space Patterns in his imaginary learning environment. Child 3 design sheet is given in figure 5.30.

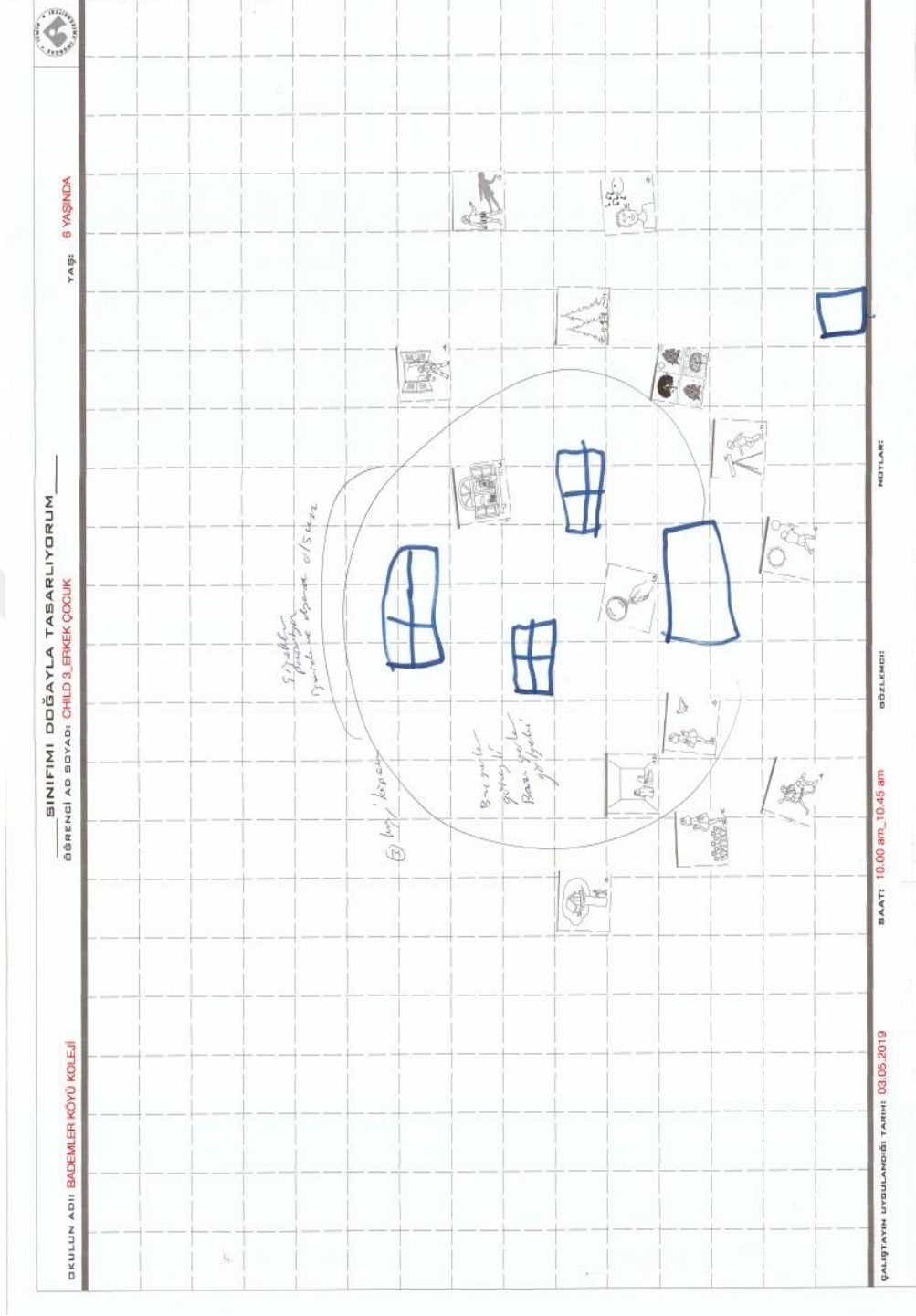


Figure 5.30 Design Sheet of Child 3

#### 5.5.4 Child 4

Child 4 was a slightly introverted, shy girl.

##### 5.5.4.1 Questionnaire

###### *Nature in the Space Patterns:*

Based on the expressions of Child 4, it is concluded that this feature exists in schools and learning environments. It did not want some of the sub-patterns of this property to be in the class. She expressed that the learning environment should not be like a garden. In other words, she said that the class had to leave the garden. She said the wind and the sun should be outside the learning environment. In addition, she wants to see the seasons in her learning environment. She said she wanted to see her favorite summer and spring in her imaginary learning environment. Based on the answers to the imaginary learning environment, Child 4 wanted to see this feature in a learning environment setting. Some of the expressions used by the children for this feature are as follows;

- There were trees and plants in the learning environment and in the garden. The tree was not in learning environment. Not in the tree because there is no soil in the learning environment. So she did not want to see trees in her learning environment.
- She heard bird sounds in her school garden or learning environment. They were on the trees. She would like to hear the sounds of birds in her imaginary learning environment.
- She did not feel the warmth and wind of the air in her learning environment and garden. The wind is outside, the wind in the learning environment gets cold. That's why she did not want the wind in her learning environment.
- There were no water areas in her school garden. There was a fountain.
- She can take advantage of the sunlight in her school yard. In the sun we go out to the garden and play. The sun was not in the learning environment, it was out there. That's why I did not want it in her learning environment.
- She lived in the garden in her school. Let in her learning environment, summer and spring.

*Natural Analogues Patterns:*

When Child 4's responses to the subscripts of Natural Analogues Patterns, it is concluded that this feature exists in the school. She did not express a thought for the learning environment materials about how this feature should be in the learning environment of her imaginary. However, in her imaginary learning environment she wanted to see the flowers (especially the rose) and stated that she would like to see the play areas in the schoolyard, not in her learning environment. So it was understood that the child in her imaginary learning environment did not want to see this feature. Some statements for this feature;

- The furniture she used in her learning environment was made of wood. She did not know what material should be used in her imaginary learning environment.
- Her school has playgrounds where she can play her own games. Not in her imaginary learning environment, but she would like to play in the garden during breaks.
- There were flowers in her school garden. She wish she had a rose in her imaginary learning environment.

*Nature of the Space Patterns:*

For Nature of the Space Patterns, a clear statement of whether this feature was at school was not used. She wanted to have a balcony in her imaginary learning environment. She wanted an area where she can play a game in her imaginary learning environment. It can therefore be concluded that she wanted to see this feature in her learning environment. Some expressions given by the children for this feature are as follows;

- She could see her school garden and the sun from her classroom. She wishes she had a balcony in her imaginary learning environment. That way she could see from a higher level.
- She played with her friends in games like detective in her school. She kept something in the garden that she wanted to hide in her imaginary learning environment. Behind the flowers and trees.

A questionnaire form containing the statements of Child 4 biophilic design is given in figure 5.31.

ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.4_KIZ_6 YAŞ							
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:		HAYALİ DERECE
ANA GRUP	DÜZEN	MEVCUT	HAYALİ	Hiç önemli değil	Bilmiyorum	Önemli	
	MEKÂNSAL DÜZENLERDE DOĞA	1	Sınıfımızda çimen yok, bahçede var. Ağaçta yok. Ağaç sınıfta olmaz ki.	Olmaz sınıfta toprak yok.	✓		
		2	Bazen.	İyi olur.			✓
		3	Evet duyuyorum. Ağaçların üstünde oluyor.	İsterim.			✓
		4	Hissetmiyorum.	Hayır istemem. Rüzgâr dışarıda olur. İçeride olursa üşürüz.	✓		
		5	Bahçede çeşme var.	Kulaktan kulağa ve yakar top oynarım.			✓
		6	Evet oynuyoruz. (Arkadaşı ile anısından bahsediyor..)	Güneş sınıfta olmaz dışarıda olur.			✓
		7	Evet. (Mevsimleri saymaya başlıyor..)	Sınıfta yaz ve ilkbahar olsun.			✓
	DOĞALI ANDIRAN DÜZENLER	8	Evet ağaçtan.	Bilmiyorum.		✓	
		9	Bahçede oyun alanları var.	Teneffüste bahçede oyun oynamak isterdim.			✓
		10	Evet var.	Gül olsun.			✓
	MEKÂNSAL DÜZENLERİN DOĞASI	11	Camdan baktığımda güneşi görüyorum.	Sınıfın balkonu olsa oraya çıkar görürdük.			✓
		12	Bilmiyorum.	Evimizdeki çatı katı.		✓	
		13	Evet. Bahçede oyun oynarız. Çimenlerde.	Bahçeye saklarım. Çiçeklerin arasına. Saklambaç gibi evin, ağaçların arkasına saklanırdım.			✓
		14	Hayır.	Bilmiyorum.			✓

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Figure 5.31 Questionnaire answer for Child 4

#### 5.5.4.2 Design Sheet

When look at the Child 4 design sheet, the learning environment model is drawn with very clear lines. The windows, roof, classroom door and lawns in the garden are clearly drawn. According to Child 4, the learning environment must be completely detached from the garden. The school did not want to see the tracks in the garden. Questionnaire also used expressions in this aspect of the drawing is clearly supported. However, she drew two floors while drawing her imaginary learning environment. There were two windows on each floor. In questionnaire form, she wanted to see the garden from her imaginary environment class by going out to the balcony. In the same way, she also transferred this to her drawing. Looking at Child 4's design sheet, Nature in the Space Pattern and Natural Analogues Patterns does not want to see in her imaginary learning environment. But she wants to see Nature of the Space Patterns. Child 4 design sheet is given in figure 5.32.

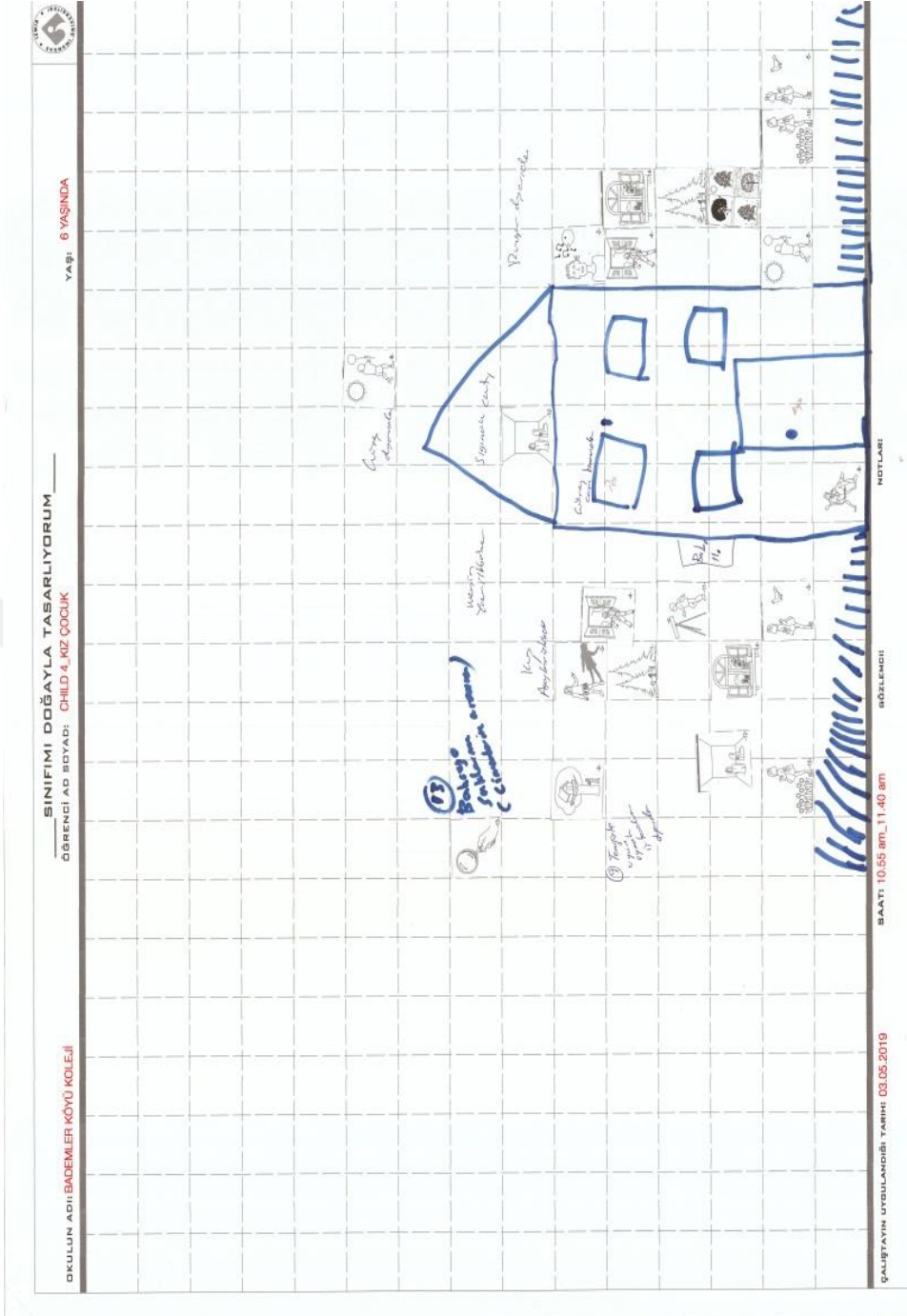


Figure 5.32 Design Sheet of Child 4

### 5.5.5 Child 5

She was a calm five-year-old girl who did not answer very clearly the questions asked.

#### 5.5.5.1 Questionnaire

##### *Nature in the Space Patterns:*

When look at the views of the Child 5 biophilic design on Nature in the Space Patterns, she stated that there is this feature in the existing school garden and learning environment. She wanted this feature to exist in some of her sub-patterns. According to her answers, the child wanted to have a window on the ceiling of her imaginary learning environment in order to allow the sun to enter. She said that she wanted to hear the sounds in nature in her learning environment. For example, she wanted the cat to roam in her imaginary learning environment. She stated that she wanted to see winter season in her learning environment. Some of the answers given by Child 5 to this feature are as follows;

- There were trees in the garden in her school. In fact, she was drawing a tree picture. She did not want to see trees in her imaginary learning environment.
- She did not hear sounds and textures in her learning environment because there were walls in her learning environment. She did not need to hear them in her imaginary learning environment.
- In nature she could sometimes hear noises like bee buzz and bird sounds. In her imaginary learning environment, She wanted the cat to walk around the learning environment.
- I don't have waterways in my school, but there is river while coming to school. We're crossing the bridge. In her learning environment, she would like to have a balloon filled with water. She wishes she could come inside and go back.
- She can take advantage of the sunlight in her school garden. She were playing outside in sunny weather. She wanted to have the windows in the ceiling in her imaginary learning environment. She wanted the sun to go through there.
- In her school, she could live the seasons. But she had never seen snow. She wanted winter in her imaginary learning environment.



*Natural Analogues Patterns:*

Given the answers to Child 5 Natural Analogues Patterns feature, it did not express whether this feature was present in schools. The only expression that she wanted this feature to be in her imaginary learning environment is that she wanted to see plants and flowers in her learning environment. Some of the statements given by the child to this feature are as follows;

- She did not know if there were any wood materials used in her school and learning environment. She did not know if she wanted to see it in her imaginary learning environment.
- In the garden in her school there were areas where she could play her own games. There was a swing and a slides. In her imaginary learning environment, she would like her learning environment to be big and beautiful for such an area.
- She did not know if she had plants and flowers in her learning environment. She wanted flowers in her imaginary learning environment.

*Nature of the Space Patterns:*

There was no evidence that this feature was in the school. She did not use expressions about how this feature should be in her learning environment. She just said it would be nice. However, she did not express an opinion about how she should be. Some expressions of the child towards this feature are as follows;

- There were areas in her learning environment that she wanted to hide. She usually hide behind the door. She did not know if she wanted to have such a field in her imaginary learning environment.
- She would like to find out some things like detective. It would be nice to play this game her imaginary learning environment. But she prefer had rather play in the garden than learning environment.

The questionnaire form of Child 5 is given in figure 5.33.

ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.5_KIZ_5 YAŞ							
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:	HAYALİ DERECE	
ANA GRUP	DÜZEN	MEVCUT	HAYALİ		Hiç önemli değil	Bilmiyorum	Önemli
 MEKÂNSAL DÜZENLERDE DOĞA DOĞALI ANDIRAN DÜZENLER MEKÂNSAL DÜZENLERİN DOĞASI	1	Var. Ben ağaç resmi çizebiliyorum.	Hayır istemem.		✓		
	2	Sınıfın duvarları var. Duymuyorum.	Fark etmez.		✓		
	3	Bazen duyuyorum.	Kedi sınıfta dolaşsın biz onu severiz.				✓
	4	Evet, hissediyorum.	Bilmiyorum.			✓	
	5	Okula gelirken ırmak var. Köprüden geçiyoruz.	İçi su dolu balonlar var. Ben onun içine giriyorum. Dönüyorum.				✓
	6	Güneş çıktığında dışarıda oynuyoruz.	Yukarıda (tavanda) camlar olmalı.				✓
	7	Evet biliyorum. Bir kere öğretmen kış resmi çizdirmişti.	Kış olsun.				✓
	8	Bilmiyorum.	Bilmiyorum.			✓	
	9	Bahçede salıncak var. Kaydırakta var.	Büyük ve güzel olsun.			✓	
	10	Bilmiyorum.	Evet.				✓
	11	Bilmiyorum.	Bilmiyorum.		✓		
	12	Kapının arkasına.	Bilmiyorum.			✓	
	13	Evet isterim.	Güzel olurdu. Bahçede oynamayı isterdim.				✓
	14	Hayır.	Bilmiyorum.				✓

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Figure 5.33 Questionnaire answer for Child 5

#### 5.5.5.2 Design Sheet

When look at the design sheet of Child 5, the drawing was evaluated as a two-dimensional plan. She showed that the walls were clearly separated from the garden, she indicated the door at full wall level and placed the window in the middle of the class. When set out from some of the answers given by Child 5, Natural in the Space Patterns, it was noteworthy that she first wanted to see the window in the imaginary learning environment ceiling. The design sheet showed this expression clearly. In her imaginary learning environment, she said that she did not want to see the trees in the questionnaire form. Likewise, she had affixed a picture of a tree to the outside of the learning environment walls she had identified in her drawing. In her current learning environment, she said that she did not hear the sounds in nature from the class walls. She expressed her wish to hear these voices in her imaginary learning environment. She supported this statement in the design sheet. She placed the picture of the sub-title into the imaginary learning environment she drew. In a statement to Child 5 Nature of the Space Patterns, she said she did not know the existence of flowers in her schoolyard, but wanted to see her in the learning environment of her imaginary learning environment of flowers. However, in the design sheet, the image of this area appears to be pasted out of the learning environment. Looking at the Child 5 in design sheet, she wanted to see Nature in the Space Patterns in her imaginary learning environment. However, since there were no clear statements about Natural Analogues Patterns and Nature Space Patterns that you wanted to see in her imaginary learning environment, it was accepted as not wanting. Child 5 design sheet is given in figure 5.34.

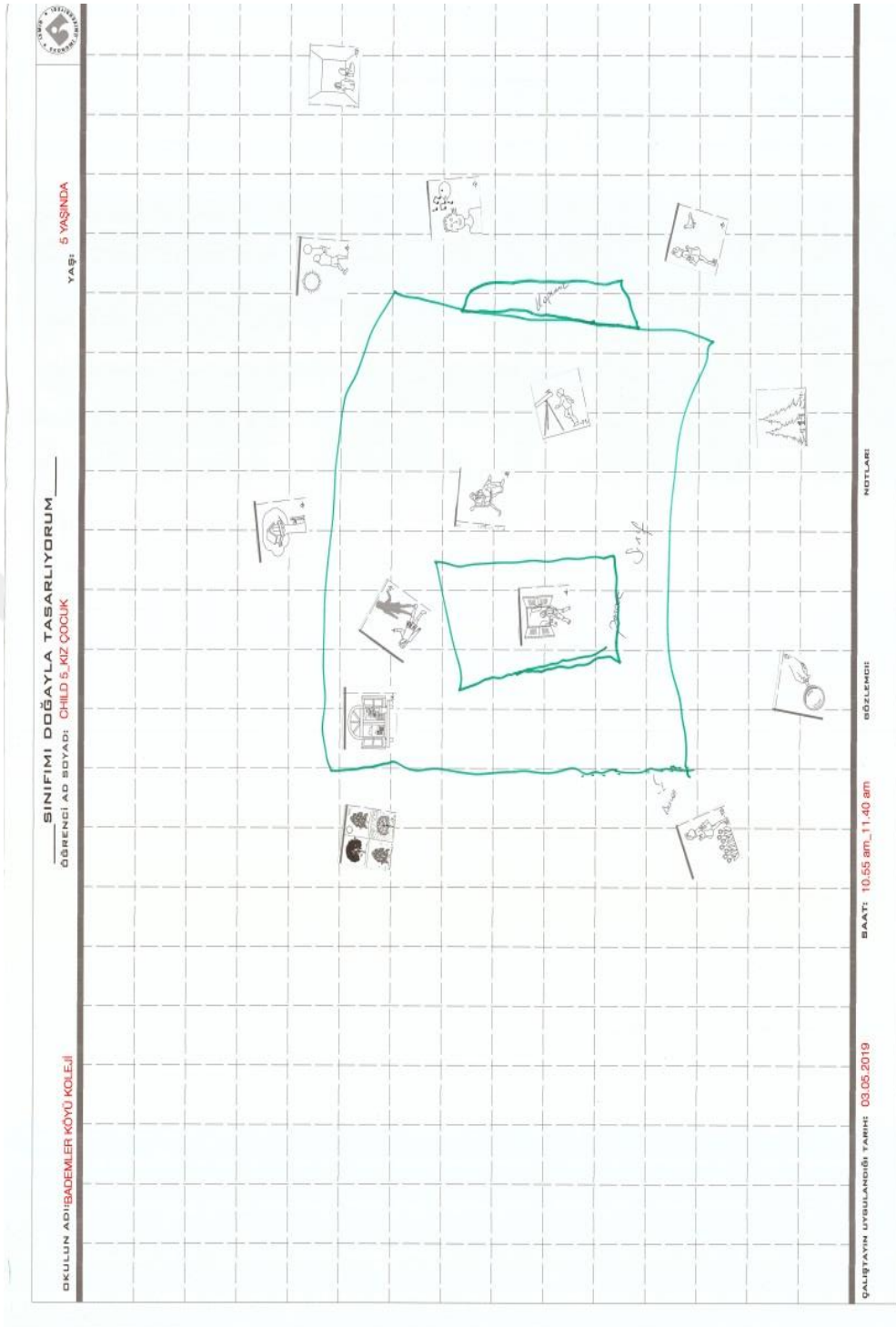


Figure 5.34 Design Sheet of Child 5

### 5.5.6 Child 6

He was a 6-year-old boy who gave interesting answers to highly intelligent moving questions.

#### 5.5.6.1 Questionnaire

##### *Nature in the Space Patterns:*

In view of Child 6 views on Nature in the Space Patterns, he says that this property is at his school. He wanted this feature to be in the learning environment of his imaginary. He stated that he had heard voices in the nature and heard the sounds of birds, felt the wind and felt the sun in the existing school garden and learning environment. In the imaginary learning environment, he wanted to see the plants, he wanted to hear the sounds of birds, he wanted to see the summer season in his learning environment. Accordingly, some of the expressions Child 6 has used for this feature are as follows;

- There were trees in his garden. They were huge but the flowers were small. He wanted to see the trees in his imaginary learning environment, but they're not too big.
- He heard the birds in nature in his garden. He wanted to hear about it in his imaginary learning environment.
- He felt the wind in the garden in his school. When the wind comes, the trees are leaning sideways. He wanted to feel the wind in his imaginary learning environment.
- He could feel the sun in his school's garden. He did not want to feel the sun in his imaginary learning environment.
- He felt the seasons in his garden. He wanted to see the summer season in his imaginary learning environment.

##### *Natural Analogues Patterns:*

When look at the answers to the sub-patterns of the Natural Analogues Patterns feature, he said that this feature is in the current school garden and learning environment. He wanted to see the flowers in his imaginary learning environment and he wanted to have spaces in the learning environment where he could write on the walls. In other words, he wanted to see this feature in his imaginary learning environment. Some of the answers to this feature are as follows;

- The items in his current learning environment were all made of wood, but the door was made of iron. He would like to see metal objects in his imaginary learning environment.
- He had a playground in his school garden where he could play a game of his own, but there was no tree house. He wanted to have spaces in his imaginary learning environment where he could write on the walls.
- There were flowers in his existing school garden. He would like to see flowers in his imaginary learning environment.

*Nature of the Space Patterns:*

He stated that this feature existed partly in the available school. He wanted to see this feature in his imaginary learning environment. In his imaginary learning environment, he stated that the learning environment items were capable of playing hide-and-seek, the learning environment not to be dark and he wanted to play mysterious games in his learning environment. Some expressions that Child 6 uses for this feature are as follows;

- He could watch his school garden from his available learning environment. He wanted to have big big windows in his imaginary learning environment.
- There were things he wanted to hide in his learning environment, we played outside. He would like to hide underneath the desk and behind the door in his imaginary learning environment.
- There were places where he had little fears in his garden. For example, he was scared when the lights go out in the bathroom. He did not think his imaginary learning environment was dark.

The questionnaire form of Child 6 is given in figure 5.35.

ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.6_ERKEK_6 YAŞ								
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:	HAYALİ DERECE		
ANA GRUP	DÜZEN	MEVCUT	HAYALİ		Hiç önemli değil	Bilmiyorum	Önemli	
İZMİR EKONOMİ ÜNİVERSİTESİ	MEKÂNSAL DÜZENLERDE DOĞA	1	Ağaçlar kocaman. Ama çiçekler küçük.	Evet isterim. Ama büyük olmasın.				✓
		2	Evet duyuyorum.	Bilmiyorum.		✓		
		3	Ağaçların altında kuş sesi var.	İsterim.				✓
		4	Evet hissediyorum. Rüzgâr çıkınca ağaçlar yan yatıyor.	Bilmem. İsterim.				✓
		5	Suyolu olmaz ki. Suda yürüyemeyiz.	Su tabancam var. Ablamı ıslatıyorum.				✓
		6	Evet, dışarıda ısınıyoruz.	İstemem.		✓		
		7	Biliyorum. Ben hiç kar görmedim. (kâğıdına kar tanesi çizdi)	Sınıfta yaz olsun.				✓
	DOĞALI ANDIRAN DÜZENLER	8	Hep tahtadan ama kapının kolu demirden.	Metal eşyaları seviyorum.			✓	
		9	Çocuk parkı var. Ama ağaç ev yok.	Sınıfta duvarlara yazabileceğim bir alan isterdim.				✓
		10	Dışarıda var.	İsterdim.				✓
	MEKÂNSAL DÜZENLERİN DOĞASI	11	Evet.	Büyük büyük pencereler yapılsın. (elleriyle açarak) Böle kocaman.				✓
		12	Saklambacı dışarıda oynuyoruz.	Kapı arkasına ya da sıra altına saklanırım.				✓
		13	Evet, çok heyecanlı.	Yüzümüzü boyarız. Kim olduğumuzu bilmezler.				✓
		14	Tuvalette ışıklar sönünce korkmuyorum. Karanlıktan korkuyorum.	Karanlık olmasın.			✓	

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Figure 5.35 Questionnaire answer for Child 6

#### 5.5.6.2 Design Sheet

When looks at the design sheet of Child 6, it is seen that he did not use a wall while drawing imaginary learning environment. The child drew the door and window in the same area. Accordingly, the Child 6 stated that he could feel the sun and wind in his current learning environment in his questionnaire form and wanted to feel them in his imagined learning environment as well. The large glass and door that it draws on the design sheet support this feature. In his drawing, he said that he wanted to write on the walls in the questionnaire section, even though the wall had not been used. The sheet might have generally accepted the wall. The usage of the design sheet could be interpreted as the way he wanted to write on the walls as stated in the questionnaire. He also said that he did not want his imaginary learning environment to be dark. The design sheet supports this feature by drawing large windows. Although Child 6 said he never saw snow, he wanted to see the summer season in his imaginary learning environment. With the snowflake drawn by the design sheet, this statement was not explicitly supported. Looking at Child 6 in the design sheet, he wanted to see Nature in the Space Patterns and Natural Analogues Patterns in his imaginary learning environment. However, since there was no clear statement that Nature wanted to see the Space Patterns in his imaginary learning environment, it was accepted as not wanting. Child 6 design sheet is given in figure 5.36.



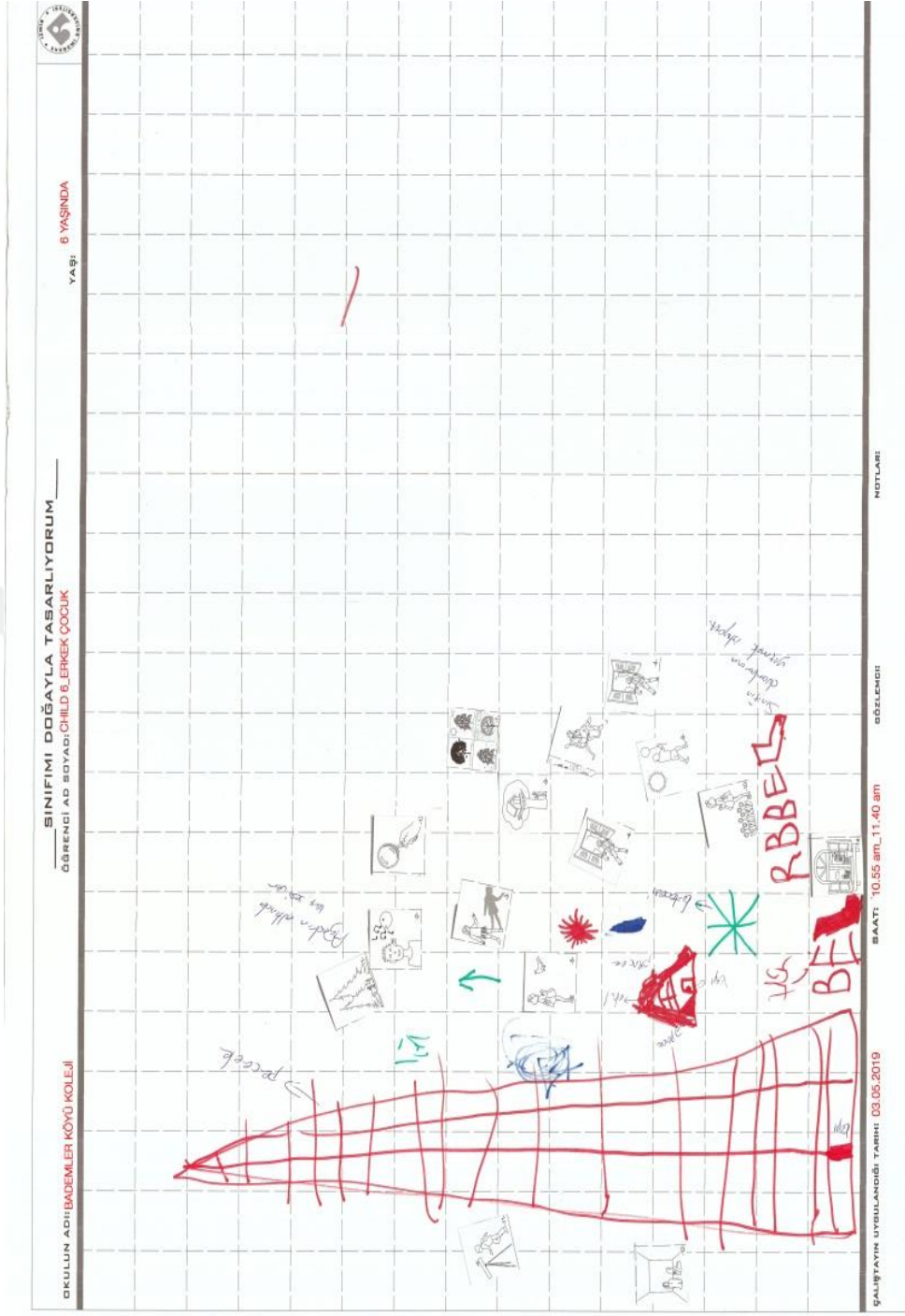


Figure 5.36 Design Sheet of Child 6

### 5.5.7 Child 7

He was an active, entertaining, extremely brave, imaginative six year old boy.

#### 5.5.7.1 Questionnaire

##### *Nature in the Space Patterns:*

Looking at Child 7 views on the Nature of the Space Patterns feature, this feature was part of the school. According to his answers, it was concluded that there were trees in the existing school garden, he smelt flowers, he heard birds sounds, he felt seasons. He said he wanted to have a birdhouse in his imaginary learning environment, had flowers in a flowerpot, and wanted to see his learning environment as white in winter. In other words, he wanted to see this feature in his learning environment. Some statements that Child 7 uses for this feature are as follows;

- There were trees in his existing school garden. Trees should breathe outside. In his imaginary learning environment, he wanted to see trees like a bird house.
- There were flowers in his existing school garden. It smelt like flowers when it got closer to his nose. In his imaginary learning environment, flowers could grow in pots.
- He heard bird sounds because the school was a lot of trees in his garden. In his imaginary learning environment, he could not see birds. Because the birds fly in the air, they could not fly in learning environment.
- He did not feel the wind in his school garden. He did not want to see the wind in his imaginary learning environment
- He had a lot of sunshine in his school garden. He did not know if he wanted to see it in his imaginary learning environment.
- He felt the seasons in his school garden. In his imaginary learning environment, winter. White like snow.

##### *Natural Analogues Patterns:*

When looks at the answers given to the Natural Analogues Patterns feature, it was stated that the objects in the current learning environment were made of wood, their own play areas in the garden were like a bird house and there were many kinds of plants in the garden. According to these expressions, there were Natural Analogues Patterns in the school garden and learning environment. In his imaginary learning environment, he did not want iron items, he wanted things to

be made of wood, he wanted learning environment windows to be cascaded. This leads us to conclude that he wanted to see this feature in his imaginary learning environment. Some of the expressions used for this feature are as follows;

- All of his stuff in his school and leaning environment were made of wood. He wanted it to be made of wood in his imaginary learning environments. Iron was too heavy.
- He did have his own playgrounds in his learning environment. There was a bird house in the garden. No bird house in his imaginary learning environment. Because there were no trees.
- There were varieties of plants in his school garden. I did not want plants in his imaginary learning environment.

*Nature of the Space Patterns:*

For Nature of the Space Patterns, he stated that he did not want to have this feature at his school. The child was asked the question of where you would like to hide in his learning environment. The boy replied no. Because his teachers said they thought they were lost. At the same time he did not want to play exciting games. He preferred windows to be cascading, choosing a climbing tree from the games he was thrilled, and hiding herself with a mask during games like detective. According to this, he wanted this feature to be in his imaginary learning environment. Some of the expressions used by the children for this feature are as follows;

- He could see his school garden from his learning environment. He wanted windows to be cascading in his imaginary learning environment. In this way, the tall child, the short child could look through the glass.
- He would like to find some secret things like detective. In his imaginary learning environment, he would like to hide himself with a mask.
- In his learning environment, there were places where he wanted to hide. But he won't hide. Because the teacher thinks we were lost. He did not know how to be in his imaginary learning environment.
- He did not have small fears in his school. He wanted to play a tree-climbing game in his imaginary learning environment.

The questionnaire form of Child 7 is given in figure 5.37.

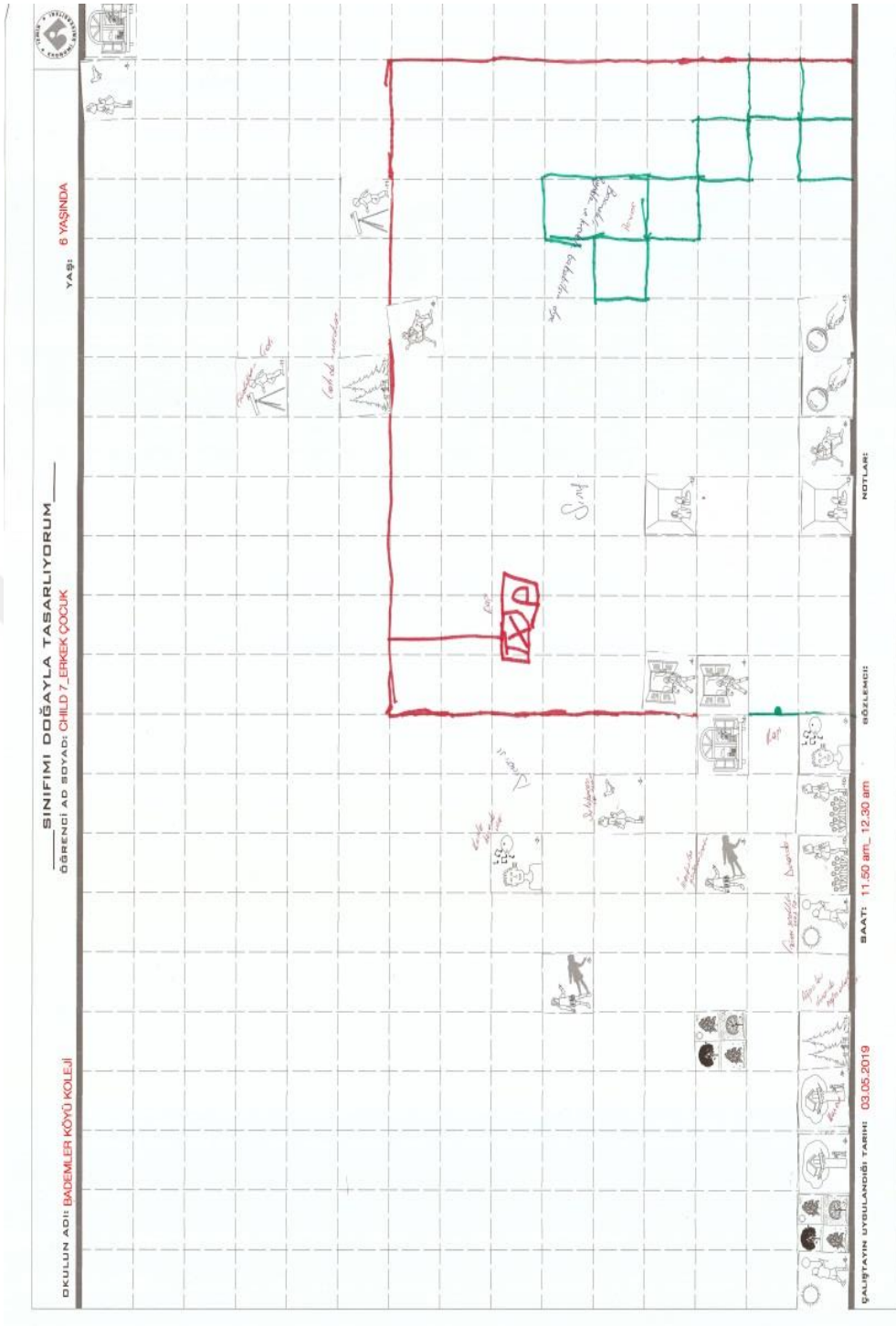
ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.7_ERKEK_6 YAŞ								
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:	HAYALİ DERECE		
ANA GRUP	DÜZEN	MEVCUT	HAYALİ		Hiç önemli değil	Bilmiyorum	Önemli	
 MEKÂNSAL DÜZENLERDE DOĞA	1	Evet var. Ağaçlar dışarıda nefes almalı.	İsterim. Kuş evi gibi olsun.				✓	
	2	Evet. Çiçeklere böyle(Vücut diliyle anlatıyor) burnumu dayıyorum mis gibi kokuyor.	Saksıda çiçekler getirilebilir. Bahçedeymişiz gibi olur.				✓	
	3	Burada çok ağaç var. Ara sıra kuşları görüyorum. Hemen kaçıyorlar.	Kuşlar havada uçar. Sınıfta uçamaz.			✓		
	4	Hissetmiyorum.	Rüzgâr. Bilmem.				✓	
	5	Havuz olsa yüzerdik ama yok.	Su tabancası ile oynamayı seviyorum. (O sırada hayali oynuyor.)				✓	
	6	Yazın çok güneş oluyor. Sevmiyorum.	Bilmiyorum.			✓		
	7	Evet. (Saymaya başlıyor. İlkbahar,yaz,sonbahar,kış)	Karı seviyorum. Beyaz beyaz. Kış olsun.				✓	
	DOĞALI ANDIRAN DÜZENLER	8	Hepsi ağaçtan.	Ağaçtan olsun. Demir çok ağır olmaz.			✓	
		9	Kuş ev (heyecanlanıyor). Bahçede ağaçtan var.	Sınıfta kuş ev olmaz. Ağaç yok çünkü.			✓	
		10	Bahçede çok var dışarıda var.	İstemem.			✓	
	MEKÂNSAL DÜZENLERİN DOĞASI	11	Ben görebiliyorum.	Pencereler basamaklı olsun. (büyük de, küçükte bakabilsin diye).			✓	
		12	O zaman öğretmen bizim kaybolduğumuzu zanneder.	Bilmiyorum.			✓	
		13	Evet isterim.	Bir kere maske taktık. Maske bizi saklar.			✓	
		14	Yok.	Ağaçlara tırmanma oyunu.				✓

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Figure 5.37 Questionnaire Answer for Child 7

#### 5.5.7.2 Design Sheet

When looks at the learning environment model he had drawn up for Child 7 design sheete, we saw his separating the learning environment from the garden walls. He used two doors to his drawing. At the same time, the child stated that the windows should be cascading in two places which were questionnaire and design sheet. The reason why the child wanted steps in the windows of his imaginary learning environment stems from the fact that he had been trained together with children from various age groups. In this way, every child will be able to see the school garden clearly. In the form of questionnaire, Child 7 wanted to see the trees in his imaginary learning environment, but not in the design sheet. The picture for that feature was located outside the learning environment boundaries. However, in his imaginary learning environment, the birds need to fly in the air, so they wanted them to be in the garden. In the design sheet, the image for this feature was supportive because it was pasted out of the learning environment. He also said that in his imaginary learning environment Child 7 wanted to see wood materials. This feature was attached to the learning environment in the design sheet. When looks at the design sheet of Child 7 according to some expressions used, it was concluded that in the learning environment of his imaginary, contrary to the questionnaire form, he did not want to see Nature in the Space Patterns. However, Natural Analogues Patterns and Nature of the Space Patterns had made drawings of what he wanted to see in his imaginary learning environment as in the questionnaire form. Child 7 design sheet is given in figure 5.38.



**Figure 5.38** Design Sheet of Child 7

### 5.5.8 Child 8

She was a six-year-old girl, withdrawn, not speaking much, shyly answering questions.

#### 5.5.8.1 Questionnaire

##### *Nature in the Space Patterns:*

She said that Nature 8 the Nature Patterns was in their school. She stated that there was grass in every area of her current school's garden, she heard the sounds of birds in the garden, she felt the wind, and she could live the seasons. In the imaginary learning environment, she wanted to see the trees, she wanted to see the green color, she wanted to see the winter season. According to this, it was concluded that she wanted to see the sub-patterns of this feature in her imaginary learning environment. Some statements that Child 8 has used for this feature are as follows;

- She had trees and lawns in her school garden. She wanted it to be in her imaginary learning environment. Like in her house.
- She heard voices in her learning environment. She would like to see the green color in her imaginary learning environment.
- She heard bird sounds in her school garden. She did not know if she wanted to hear it in her imaginary learning environment.
- She felt the wind in her school garden. She did not want to feel the wind in her imaginary learning environment. Because she was cold.
- No waterways in her school garden. In her imaginary learning environment, not a wall. Get water instead of wall.
- She could feel the sun in her school garden. But when it was raining, there was no sun. She did not want to see so much sun in her imaginary learning environment.
- She lived the seasons in her school garden. She wanted to see winter in her imaginary learning environment. Because she had never seen snow.
- 

##### *Natural Analogues Patterns:*

She stated that the furniture in Child 8 learning environment was made of wood, that she had her own playgrounds in her school garden and plants in her learning environment. Accordingly, it was understood that this feature exists in the school. In her imaginary learning environment, she wanted the objects to be in wood and

she wanted to have plants in her learning environment. From this point of view, she wanted this feature to be in her imaginary learning environment. Some of the expressions that Child 8 uses are as follows;

- The items in her current learning environment were made of wood. In her imaginary learning environment, she wanted them all to be made of wood.
- In her school garden there were areas where she could play her own games. There was a gazebo in the garden. She did not know if she wanted it in the learning environment. But she would like to sleep in it.
- There were plants in her learning environment. She wanted them to be in her imaginary learning environment. She will put them behind the door.


*Nature of the Space Patterns:*

For the Nature of the Space Patterns, the child said that this feature was partly at school. The child stated that he could watch the school garden from his learning environment and hide in the closet. In the imaginary learning environment, she did not said that she wanted to have this feature. Some statements that Child 8 uses for this feature are as follows;

- From her learning environment, she saw her garden. She did not know if she wanted to see this in her imaginary learning environment.
- In her learning environment, she wanted to hide in the closet. In her imaginary learning environment, she would like to hide in the closet.
- We were not playing games to find hidden things like detective. She did not know if she wanted it in her imaginary learning environment.
- In her school garden, there were areas she was excited about, scared of. She was so excited when racing. She did not know if she wanted it in her imaginary learning environment.

The questionnaire form of Child 8 is given in figure 5.39.



ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.8_KIZ_6 YAŞ								
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:	HAYALİ DERECE		
ANA GRUP	DÜZEN	MEVCUT	HAYALİ		Hiç önemli değil	Bilmiyorum	Önemli	
 MEKÂNSAL DÜZENLERDE DOĞA	1	Her taraf çimen.	Bizim evde çok var.				✓	
	2	Bahçede duyuyorum.	Ben yeşil rengi çok severim.		✓			
	3	Duyuyorum.	Bilmiyorum.		✓			
	4	Rüzgârda üşüyorum.	İstemem çünkü üşüyorum. Hasta olurum sonra.		✓			
	5	Bilmiyorum.	Duvar olmasın. Duvar yerine su olsun.				✓	
	6	Evet, ama yağmur yağarken güneş olmuyor.	Çok istemem az olsun.		✓			
	7	Evet biliyorum.	Kar olsun ben hiç kar görmedim.				✓	
	DOĞALI ANDIRAN DÜZENLER	8	Evet ağaçtan.	Hepsi ağaçtan olsun.				✓
		9	Var. Bahçede çardak var. Yağmurda altına kaçıyorum.	Bilmem. İçinde uyumak isterdim.				✓
		10	Evet var.	Evet isterim. Onları yan yana kapının arkasına koyalım.				✓
	MEKÂNSAL DÜZENLERİN DOĞASI	11	Görüyorum. Dışarıya çıkınca da hepsini görürüz.	Bilmiyorum.		✓		
		12	Dolap var.	Babamla oyun oynarken dolaba saklanıyorum.				✓
		13	Hayır oynamıyoruz.	Bilmiyorum.		✓		
		14	Yarış yaparken çok heyecanlanıyorum.	Bilmiyorum.		✓		

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Figure 5.39 Questionnaire Answer for Child 8

#### 5.5.8.2 Design Sheet

When looks at Child 8's design sheet, it was seen that there were no class walls, that only the child drawn door and window. She said that she wanted to see trees and grass in her imaginary learning environment, as expressed in questionnaire form. She also stated that she wanted to see the green color in nature in her imaginary learning environment. According to the design sheet and the description given to the questionnaire, she concludes that Child 8 did not want a barrier between the school garden and the imaginary learning environment. She used the pictures and drawings in the Child 8 design sheet at close distances. This can lead us to understand that in general she wanted to see the sub-features of 14 patterns in her imaginary learning environment. In her answers to the Questionnaire form she was known to want to see Patterns and Natural Analogues Patterns in Nature. It could be concluded that the design sheet supports the answers given to these features by not using the wall and placing pictures at close distance. She used more ambiguous expressions in her questionnaire form for the subcategories of Nature of the Space Patterns for her imaginary learning environment. There was no information to refute these expressions in the design sheet. Therefore, it can be concluded that she wanted to see this feature in her imaginary learning environment. Child 8 design sheet is given in figure 5.40.

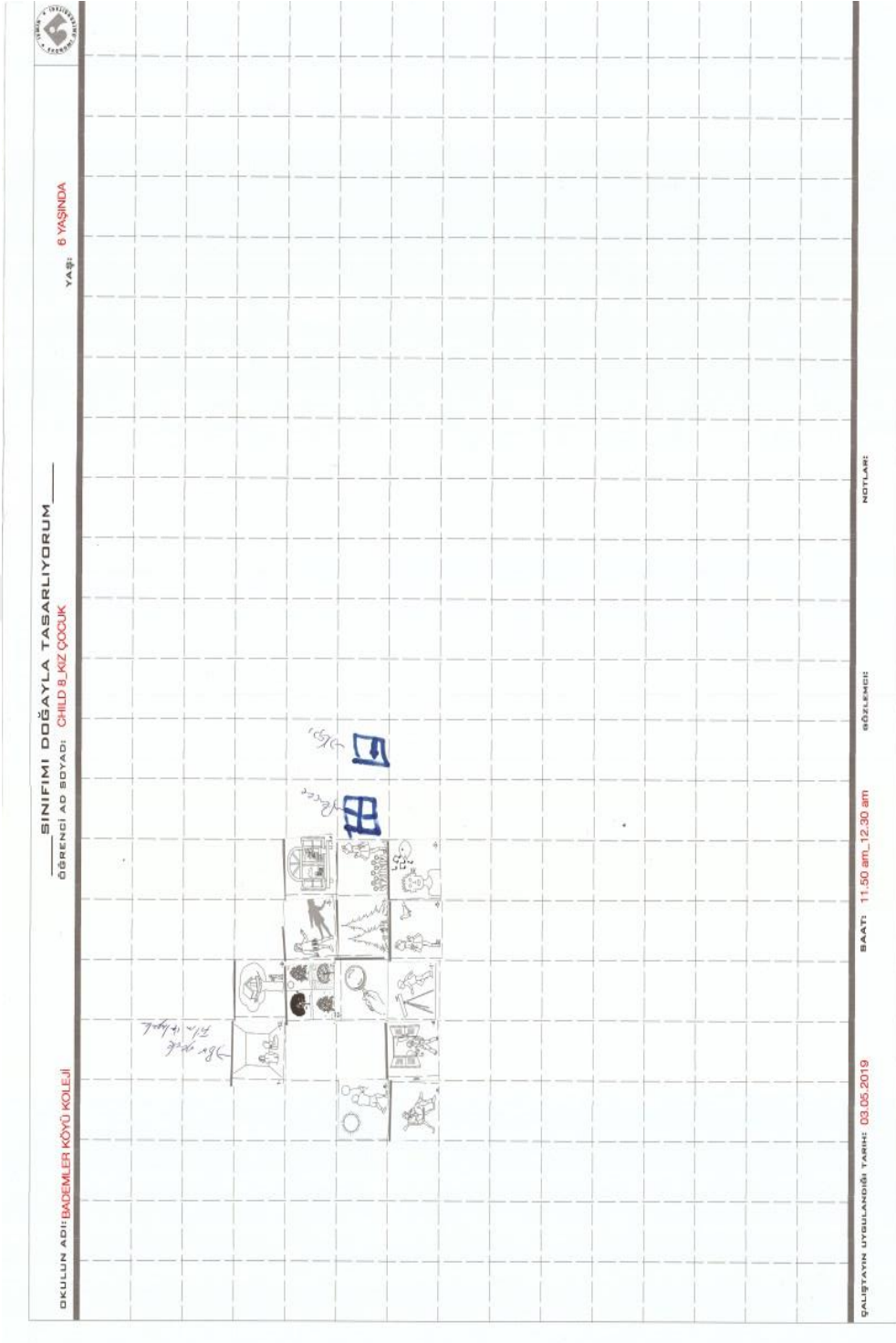


Figure 5.40 Design Sheet of Child 8

### 5.5.9 Child 9

She was a five-year-old girl with a strong imagination.

#### 5.5.9.1 Questionnaire

##### *Nature in the Space Patterns:*

When the views of the biophilic design on Nature in the Space Patterns were examined, it was stated that almost all of this feature was in the existing school. She said that she wanted to see the plants in her learning environment in relation to the sub-patterns of this feature in her imaginary learning environment. In this way, she thinks her learning environment will be like a garden. She also stated that she wanted to hear the light and the smell in her imaginary learning environment. Some expressions of Child 9 are as follows;

- There were many flowers in her existing school garden but there was one in her learning environment which was very small. She would like to see the flowers in her imaginary learning environment. It will be like a garden.
- She smelled trees in her school garden. She would like to hear a tree smell in her imaginary learning environment. It smell good when it rains. If we open the windows we will hear that smell.
- She did not hear bird sounds in her school garden. There were peacocks and sheep in the garden. But they did not. She would like to hear it in her imaginary learning environment.
- She felt the wind in her school garden. Sometimes she got cold when she was going to eat in winter. She did not want to feel the wind in her imaginary learning environment.
- She felt the sun in her school garden. She loved the sun. She wanted to feel the sun in her imaginary learning environment. Then it will be bright everywhere. Because sometimes we light the lamps in learning environment.
- She did not know how she felt in her current school. But in her imaginary learning environment she would like to have a summer because it was hot in the summer and there was no school. At the same time, she would like to see the spring and winter.

*Natural Analogues Patterns:*

Natural Analogues Patterns, this feature was partly available in the school. In the imaginary learning environment, it was about these properties that the materials were made of wood and that there were small flowers in the learning environment, not big flowers. But she said that great things like trees should not be in the imaginary learning environment. This means that Child 9 wanted to see Natural Analogues Patterns in her imaginary learning environment. Some of the expressions that Child 9 uses for this feature are as follows;


- In her school and learning environment, the furniture was wood. All unpainted. In her imaginary learning environment, she wanted things to be made of wood. Because iron hurts our hands.
- In her learning environment she had her own play areas where there were trees. In her imaginary learning environment, no trees.
- Flowers were not available in her class. No flowers, no trees. Because the learning environment was not garden. She wanted small flowers in her imaginary learning environment.

*Nature of the Space Patterns:*

She stated that Nature of the Space Patterns exists in her school. While she wanted the walls to be made of glass in her imaginary learning environment, she wanted the play spaces to be out of the learning environment. Some of the expressions that Child 9 uses for this feature are as follows;

- From her learning environment, she saw her garden. The windows were below and large. She wanted to have glass everywhere in her imaginary learning environment.
- In her learning environment, there were places where she wanted to hide. She was hiding behind the door. She did not want it in her imaginary learning environment. It was better kept out there.
- She did not want to play some secret things like detective. She wanted to play in the garden in her imaginary learning environment.
- There were some small fears in her school. She got excited in some games. She did not know if she wanted it to be in her imaginary learning environment. On the swing, she got excited as she go up.

The questionnaire form of Child 8 is given in figure 5.41.

ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.9_KIZ_5 YAŞ							
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:	HAYALİ DERECE	
ANA GRUP	DÜZEN	MEVCUT	HAYALİ		Hiç önemli değil	Bilmiyorum	Önemli
	MEKÂNSAL DÜZENLERDE DOĞA	1	Sınıfta bir tane çiçek var ama çok küçük. Ama bahçede çok var.	Çok güzel olur. Bahçedeymiş gibi olur.			✓
		2	Evet, ağaç kokusu alıyorum.	Olur. Yağmur yağınca hava güzel kokuyor. Camları açarsak o kokuyu duyarız.			✓
		3	Bahçede tavus kuşu ve koyunlar var. Ama tavus kuşu ötmüyor.	Güzel olur.			✓
		4	Evet hissediyorum. Kışın yemek yemeğe giderken bazen üşüyorum.	İstemem.		✓	
		5	Yok, ama ağaçlara bakan amca hortumla yolları suluyor.	Bilmiyorum.		✓	
		6	Evet, güneşi çok seviyorum. Dışarı çıkıyoruz. Babamlarla piknik yapıyoruz.	Evet isterim. O zaman her yer aydınlık olur. Bazen sınıfta lambaları yakıyoruz.			✓
		7	Biliyorum.	Yazın sıcak oluyor. Yazın okul yok. Yaz olsun. İlbahar ve kış da olsun.			✓
	DOĞALI ANDIRAN DÜZENLER	8	Hep ağaçtan. Ama boyalı değil. Hepsi boyasız.	Ağaç daha güzel, demir elimizi acıtır.			✓
		9	Bahçede ağaçların olduğu yerde var.	Sınıfta ağaç olmaz. Evde olmaz.			✓
		10	Çiçek de ağaç da yok. Sınıf bahçe değil.	Evet isterim. Küçük çiçekler olsun.			✓
	MEKÂNSAL DÜZENLERİN DOĞASI	11	Evet görüyorum. Pencereler aşağıda ve büyük.	İsterim. Her yer cam olsun.		✓	
		12	Evet var. Kapı arkasına saklanıyorum.	Dışarıda daha güzel saklanırım. Ağaçların olduğu yerde saklanırım.			✓
		13	Hayır.	Serbest bir şekilde, bahçede oynamayı isterdim.		✓	
		14	Bazı oyunlarda heyecanlanıyorum	Salıncakta yukarı çıktıkça heyecanlanıyorum.			✓

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Figure 5.41 Questionnaire Answer for Child 9

### 5.5.9.2 Design Sheet

When looks at the Child 9 design sheet, limiting information was obtained from the learning environment model that it drawn. Some of the statements used in questionnaire form were supportive of the design sheet. She wanted to see the flowers in her imaginary learning environment. In the design sheet, she had drawn the flower figures herself. She stated that she did not want any trees inside the learning environment, both in questionnaire form and on the design sheet. Child 9 quesitonnaire form, she wanted her imaginary learning environment to be glass everywhere. However, in the learning environment model that she has designed, she has limited windows. Nature in the Space Patterns, Natural Analogues Patterns and Nature of the Space Patterns wanted to see in her imaginary learning environment. Child 9 design sheet is given in figure 5.42.



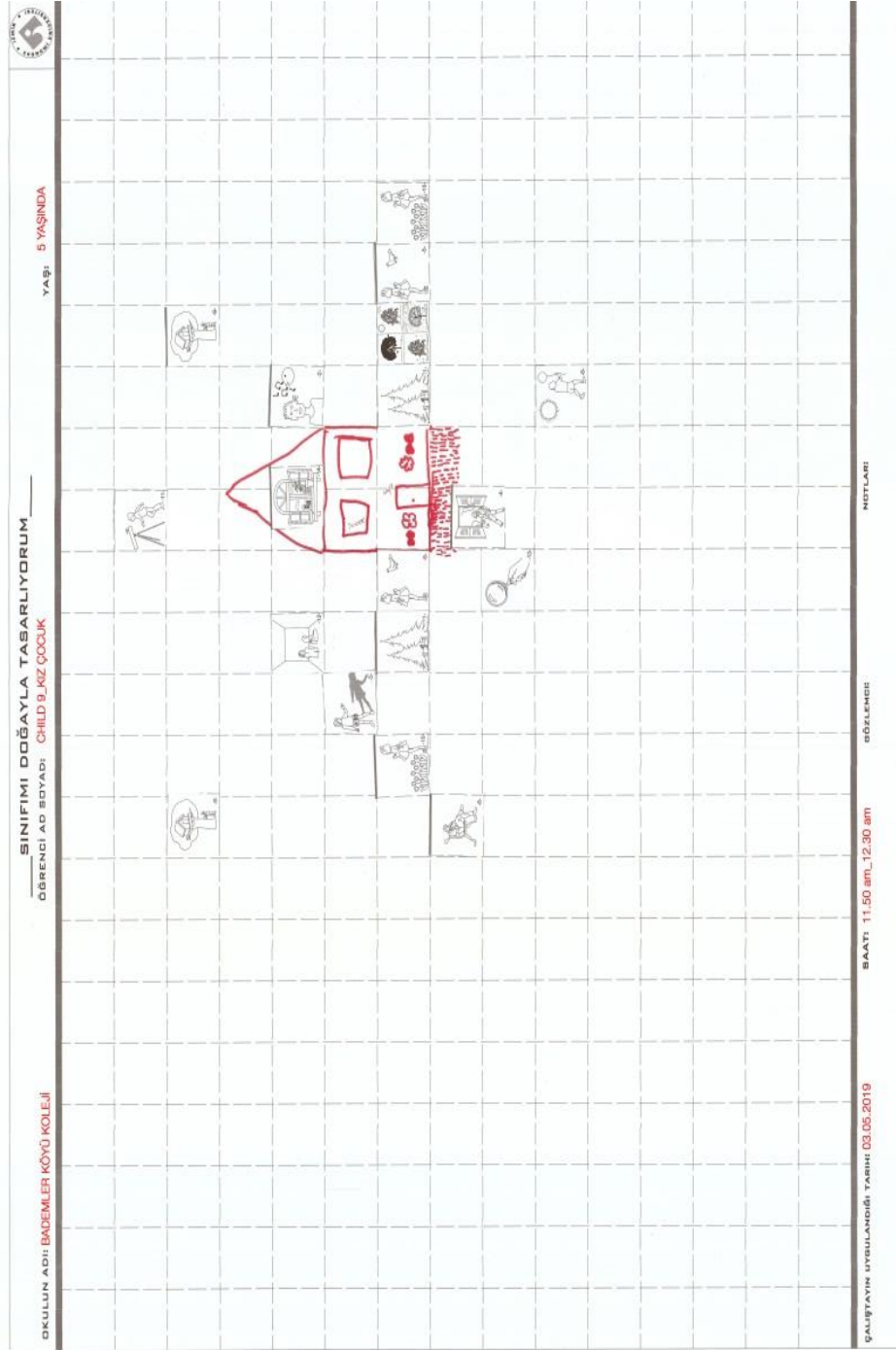


Figure 5.42 Design Sheet of Child 9



### 5.5.10 Child 10

He was a five-year-old boy who was sometimes abstaining against the questions asked.

#### 5.5.10.1 Questionnaire

##### *Nature in the Space Patterns:*

According to his views Nature in the Space Patterns, this feature was partly in school. For the sub-patterns of this feature, he stated that in his imaginary learning environment there was a red color, a very large class, walls made of glass, and he liked summer from the seasons. According to this, Child 10 wanted to see this feature in his imaginary learning environment. Some of the expressions used for this feature are as follows;

- There were trees at the entrance of the garden at his school. Sometimes, he hit him when he was playing. In his imaginary learning environment, he would like to have a tree, but then his learning environment should be huge.
- In the garden in his school, he heard colors and sounds as if in nature. His imaginary learning environment was red.
- He heard bird sounds in the garden in his school in the morning. But when they see us, they run away. It shouldn't be in his imaginary learning environment. Because there was noise and we could not do lessons.
- He felt the wind in his school garden. The wind blew on me. He did not know if it should be in his imaginary learning environment.
- He could see his garden from his learning environment. The walls of his imaginary learning environment should be made of glass.
- In his school garden, he felt the seasons. He would like to see all the seasons in his imaginary learning environment, but he would like to see more of the summer. Because he played more games in summer.

##### *Natural Analogues Patterns:*

From the expressions given by Child 10, Natural Analogues Patterns was understood to have little in school. In his imaginary learning environment, he stated that items should not be made of wood. Some expressions used by Child 10 are;


- The items in his learning environment were made of wood. In his imaginary learning environment, did not make the items from the tree. Because if the tree from the forests were reduced. It did not rain at that time.
- He had his own playground in his school garden, but he could not stay in it. In his imaginary learning environment, he would like to move these playgrounds.
- No plants in his learning environment. He did not know if he wanted it in his imaginary learning environment.

*Nature of the Space Patterns:*

For Nature of the Space Patterns, he stated that this feature was partly at school. He expressed that he might be in part in his imaginary learning environment. Here are some statements of Child 10 for this feature;

- He said he saw the school garden from his learning environment. There was glass on the ceiling of the corridor of his current learning environment. But he saw the sun, not the garden. In his imaginary learning environment, he would like to.
- In his learning environment, he hide in the closet. He did not know where to hide in his imaginary learning environment.
- He liked to play games like detective. He put it in the shoe. Nobody can. He would like to play in his imaginary learning environment.
- He did not have small fears in his school garden. He had a lamb, but he was not afraid of him. He did not know if he wanted it in his imaginary learning environment.

The questionnaire form of Child 10 is given in figure 5.43.

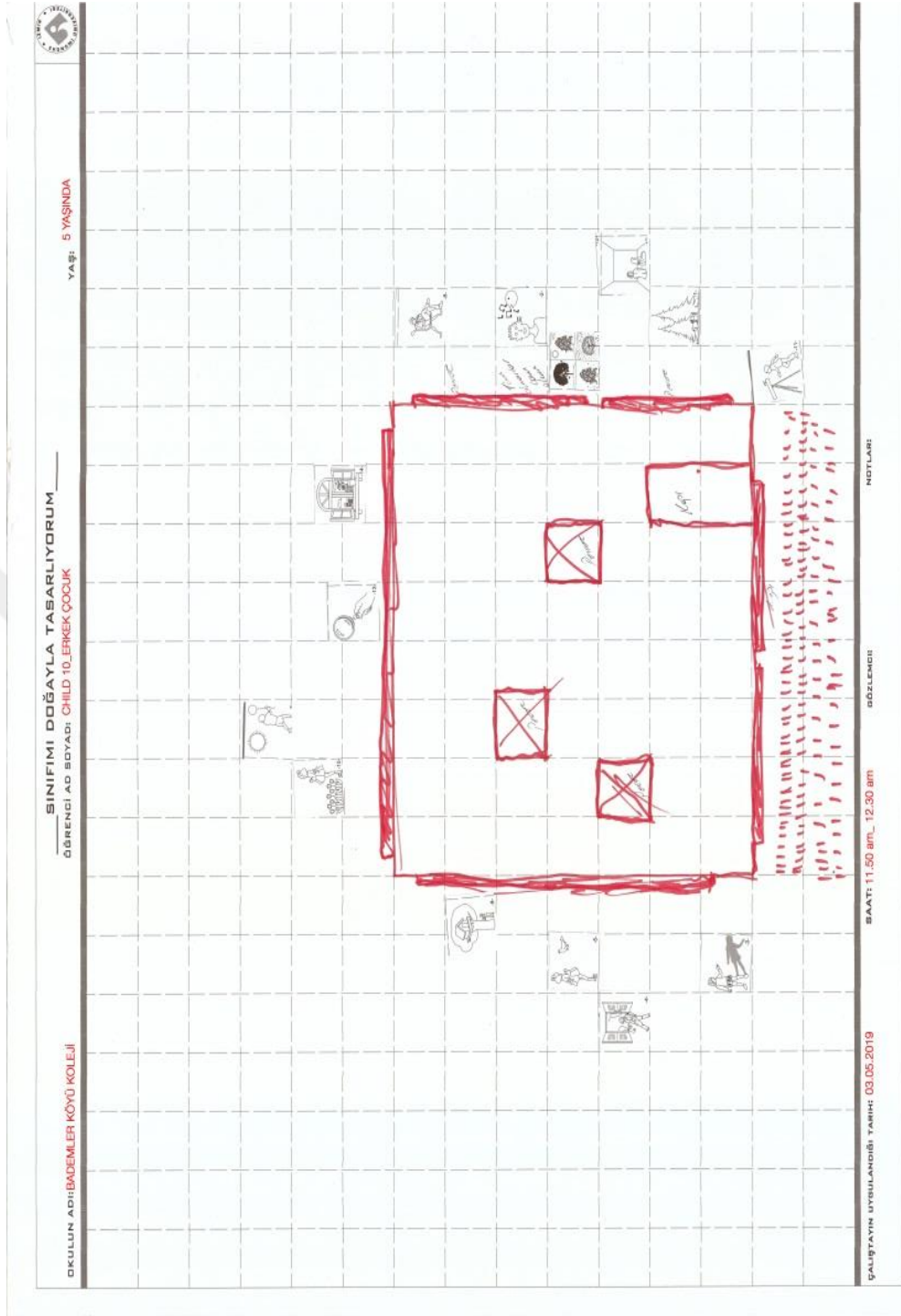
ÇALIŞTAY ÖĞRENCİ CEVAPLARI_CH.10_ERKEK_5 YAŞ							
OKUL ADI:	BADEMLER KÖYÜ KOLEJİ		GÖZLEM TARİHİ:	03.05.2018	SAATİ:		HAYALİ DERECE
ANA GRUP	DÜZEN	MEVCUT	HAYALİ	Hiç önemli değil	Bilmiyorum	Önemli	
	MEKÂNSAL DÜZENLERDE DOĞA	1	Sınıfımızın girişinde var. Oyun oynarken bazen ona çarpıyoruz.	İsterim ama o zaman sınıfımız çok büyük olmalı.			✓
		2	Arada sırada.	Renk olacaksa, kırmızı olsun.			✓
		3	Evet, sabahları okula gelirken duyuyorum. Ama bizi görünce kaçıyorlar.	Sınıfta olursa gürültü olur ders yapamayız.	✓		
		4	Evet duyuyorum. Rüzgâr esince beni itiyor.	Bilmiyorum.		✓	
		5	Suyolları yok ama ben suyu seviyorum	Bilmiyorum		✓	
		6	Evet.	Duvarlar cam duvar olsun.			✓
		7	Evet biliyorum.	Hepsi olsun ama yaz daha çok olsun. Yazın dışarıda daha çok oyun oynuyorum.			✓
	DOĞALI ANDIRAN DÜZENLER	8	Sınıfta eşyalar ağaçtan yapılmış.	Ağaç olursa ormanlar azalır. Yağmur az yağar.		✓	
		9	Ağaçta oyun alanları var ama içinde kalamıyorum.	Taşımak isterdim.			✓
		10	Sınıfta yok.	Bilmiyorum.	✓		
	MEKÂNSAL DÜZENLERİN DOĞASI	11	Görüyorum.	Koridorun üstünde cam var. Ama bahçeyi değil, güneşi görüyoruz. Sınıfta da olsun isterim.			✓
		12	Dolaba saklanırım.	Bilmiyorum.		✓	
		13	Evet. Ayakkabıların içine koyarım. Kimse bulamaz.	Güzel olurdu oynamak isterim ama ben saklayacağım.			✓
		14	Kuzumuz var ama korkmuyorum.	Bilmiyorum.	✓		

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Figure 5.43 Questionnaire Answer for Child 10

#### 5.5.10.2 Design Sheet

In his answer to Child 10 questionnaire, he asked that all learning environment walls be made of glass. This was the first remarkable feature in the design sheet. While drawing the imaginary learning environment, the child had placed the window in every area that he showed as a wall. At the same time, he said that the existing learning environment corridors had windows on the ceiling and wanted the light to come from here in his imaginary learning environment. When look at the child's design sheet, it was seen that this feature was reflected in his drawing. He wanted the windows to be on the whole ceiling. At the same time transferred to the drawing. Looking at the child's design sheet, he wanted to see a part Nature in the Space Patterns in his imaginary learning environment. However, he did not want to see Natural Analogues Patterns and Nature of the Space Patterns. Child 10 design sheet is given in figure 5.44.



**Figure 5.44** Design Sheet of Child 10

### 5.6 Evaluation and Discussion

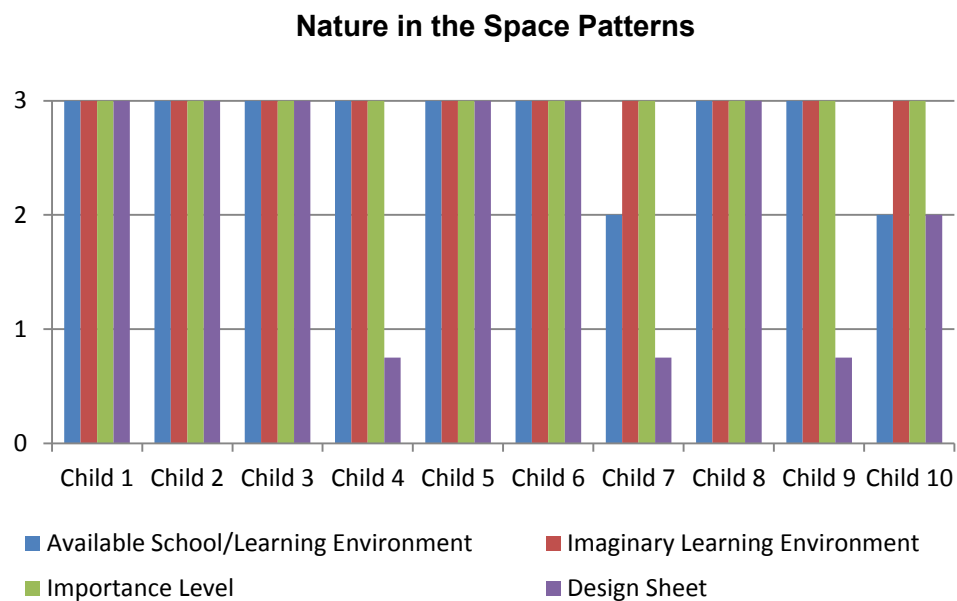
In this section, the results obtained based on the findings are discussed. The answers of the ten children who participated in the study and the design sheets are explained in detail. The results obtained in light of the data collected are given in the table below (See Table 5.2)

Table 5.2 EVALUATION OF ALL RESULTS ACCORDING TO THE 14 PATTERNS OF BIOPHILIC DESIGN													
CHILD PART	NATURE IN THE SPACE PATTERNS				NATURAL ANALOGUES PATTERNS				NATURE OF THE SPACE PATTERNS				
	QUESTIONNAIRE FORM			DESIGN SHEET	QUESTIONNAIRE FORM			DESIGN SHEET	QUESTIONNAIRE FORM			DESIGN SHEET	
	AVAILABLE SCHOOL/ CLASS	IMAGINARY CLASS	IMPORTANCE LEVEL (for imaginary class)		AVAILABLE SCHOOL/ CLASS	IMAGINARY CLASS	IMPORTANCE LEVEL (for imaginary class)		AVAILABLE SCHOOL/ CLASS	IMAGINARY CLASS	IMPORTANCE LEVEL (for imaginary class)		
CHILD 1	Available	Wants	Important	Wants	Not available	Wants	Important	Wants	Not available	Wants less	Important	Wants	Wants
CHILD 2	Available	Wants	Important	Wants	Less available	Wants	Uncertain	Wants	Less available	Wants less	Uncertain	Does not want	Does not want
CHILD 3	Available	Wants	Important	Wants	Available	Wants	Uncertain	Wants	Available	Wants	Important	Wants	Wants
CHILD 4	Available	Wants	Important	Does not want	Available	Does not want	Important	Does not want	Not available	Wants	Important	Wants	Wants
CHILD 5	Available	Wants	Important	Wants	Not available	Does not want	Uncertain	Does not want	Not available	Does not want	Important	Does not want	Does not want
CHILD 6	Available	Wants	Important	Wants	Available	Wants	Important	Wants	Less available	Wants	Important	Does not want	Does not want
CHILD 7	Less available	Wants	Important	Does not want	Available	Wants	Uncertain	Wants	Not available	Wants	Uncertain	Wants	Wants
CHILD 8	Available	Wants	Does not matter	Wants	Available	Wants	Important	Wants	Less available	Does not want	Does not matter	Wants	Wants
CHILD 9	Available	Wants	Important	Does not want	Less available	Wants	Important	Does not want	Available	Does not want	Important	Does not want	Does not want
CHILD 10	Less available	Wants	Important	Wants less	Less available	Wants less	Uncertain	Does not want	Less available	Wants less	Important	Does not want	Does not want

Looking at this table, all of the participating children stated that biophilic design was present in the schools of Nature in the Space Patterns, which was the first

feature of the 14 patterns. At the same time, all participating children wanted Nature in the Space Patterns to be in their imaginary learning environment. This feature was significant for all participating children excepted for one child.

There was a parallelism between the answers given by the participating children to the Nature in the Space Patterns feature in the form of questionnaires and the design sheet of the children. In addition to the three children, all other children expressed their wish to see these features in their design sheets (See Figure 5.45).

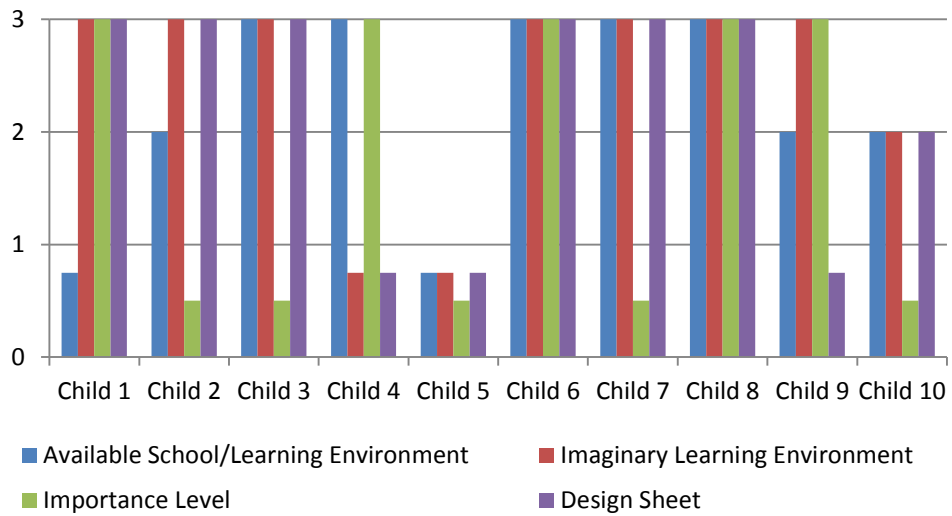


**Figure 5.45** Graph for Nature in the Space Patterns

Two of the participating children say that Natural Analogues Patterns was not available in their schools. In addition, three children stated that they were less available, while the other five children stated that they were available. In this respect, the majority of the participants stated that this feature was present in their schools in the questionnaire form. Two of the participating children did not want the Natural Analogues Patterns, while the other eight children wanted to see this feature. While seeing this feature in the learning environment of their imagination was important for the half, the other half expressed their abstention. In all ten children, there was a parallelism between the answers given in the questionnaire form for the Natural Analogues Patterns feature of the biophilic design and the drawings on the children’s design sheets. While four participant

children said that they did not want to see this feature in their imaginary learning environment, the other six children wanted to see it (See Figure 5.46).

### Natural Analogues Patterns

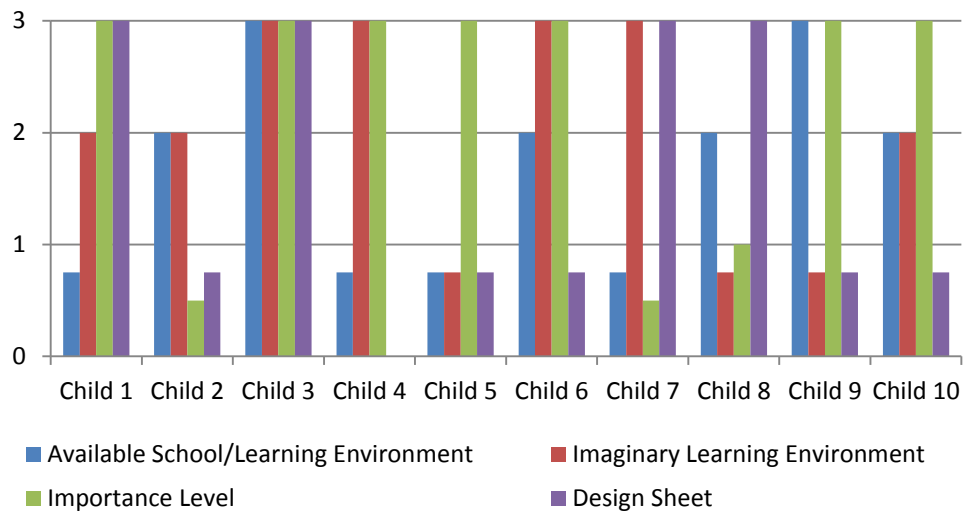


**Figure 5.46** Graph for Natural Analogues Patterns

Four of the participating children stated that biophilic design can not be seen in the current classes of Nature of the Space Patterns. The majority of other children said that they were available. Three of the participating children did not want this feature to be in the learning environment of their imagination, while the other seven children wanted to see this feature in their learning environment. More than half of the participating children stated that it was important to have this feature in their learning environment. There was no parallelism between the answers given to the questionnaire form and the drawings they have drawn on the design sheet. This might be because of possible difficulties of children representing themselves in drawing. The results of the final evaluation and Table 5.1 are combined in a general graphs below (See Figure 5.47).



### Nature of the Space Patterns



**Figure 5.47** Graph for Nature of the Space Patterns

The most significant of the three main categories of biophilic design was found to be Nature in the Space Patterns. The second place is Natural Analogues Patterns, while the last one is Nature of the Space Patterns.

In addition, the results of the observation sheets show four subheadings that indicate that Nature in the Space Patterns obtains in the existing school gardens. Other subtitles are categorized as very poor, average, and good. It is concluded that the three subheadings of the Natural Analogues Patterns obtains in the existing school gardens. In the final feature Nature of the Space Patterns, these three subtitles are good, while the other subtitle is average. According to this, there is not a big difference between the answers given by ten children and the observation sheet. The observation sheet form and observation sketch sheet Figure 5.48, Figure 5.49, Figure 5.50 and Figure 5.51 are given.

**14 PATTERNS OF BIOPHILIC DESIGN\_OBSERVATION SHEET BY DESIGNERS**




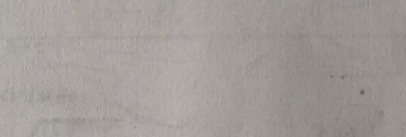

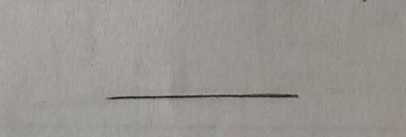
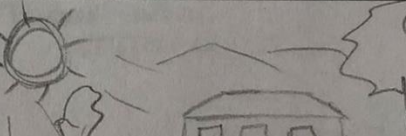
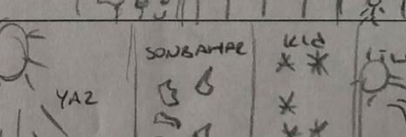


SCHOOL NAME:	MAIN GROUP	DEGREE	OBSERVATION DATE:					Description	
			STEP 1	poor	fair	average	good		very good
NATURE IN THE SPACE PATTERNS	1	Visual Connection with Nature	1		2	3	4	5	
	2	Non-Visual Connection with Nature					✓		
	3	Non-Rhythmic Sensory Stimuli					✓		
	4	Thermal & Airflow Variability					✓		
	5	Presence of Water	✓						
	6	Dynamic & Diffuse Light					✓		
	7	Connection with Natural Systems						✓	
	8	Biomorphic Forms & Patterns					✓		
	9	Material Connection with Nature					✓		
	10	Complexity & Order				✓			
	11	Prospect			✓				
	12	Refuge			✓				
	13	Mystery		✓					
	14	Risk/Peril						✓	
NATURAL ANALOGUES PATTERNS									
NATURE OF THE SPACE PATTERNS									

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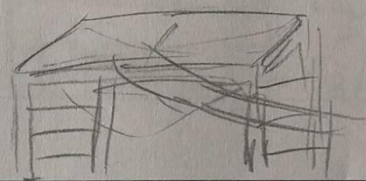

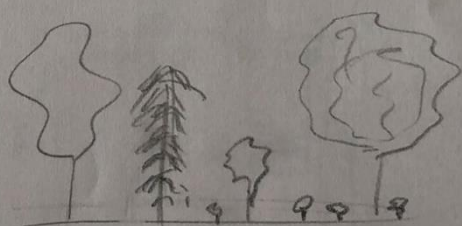
page\_01/04

**Figure 5.48** Observation Form: This form is to be used by the designer.

14 BİYOFİLİK TASARIM ÖĞELERİ_TASARIMCIYAN KAYNAK FORMU			
OKUL ADI:	BADEM KÖYÜ KOLEJİ		GÖZLEM TARİHİ:
ANA GRUP	ADIMLAR	ADIM AÇIKLAMASI	ESKİZLER
 UZAY DESENLERİNDE DOĞA	1	Doğa ile Görsel Bağlantı	
	2	Doğa ile Görsel Olmayan Bağlantı	
	3	Ritmik Olmayan Duyusal Uyarılar	
	4	Termal ve Hava Akış Değişkenliği	
	5	Su Varlığı	
	6	Dinamik ve Yaygın Işık	
	7	Doğal Sistemlerle Bağlantı	

İZMİR EKONOMİ ÜNİVERSİTESİ\_ Gülferm ERGÜNEŞ KÜTÜK  
 SOSYAL BİLİMLER ENSTİTÜSÜ\_TASARIM ÇALIŞMALARI YÜKSEK LİSANS PROGRAMI (2019) sayfa\_02/04


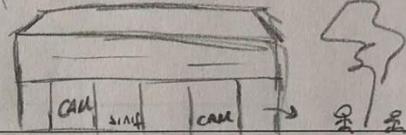
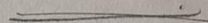
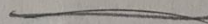
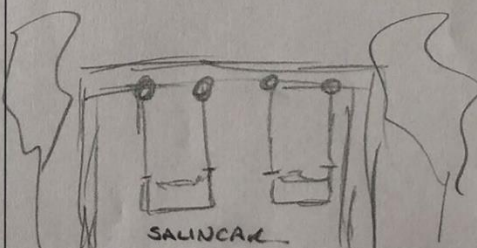
Figure 5.49 Observation Sketch Form: This form is to be used by the designer.

14 BİYOFİLİK TASARIM ÖGELERİ_TASARIMCIDAN KAYNAK FORMU			
OKUL ADI:	BADENEL KÖYÜ KOLEJİ		GÖZLEM TARİHİ:
ANA GRUP	ADIMLAR	ADIM AÇIKLAMASI	ESKİZLER
 DOĞAL ANALOGLAR DESENLER	8	Biyomorfik Formlar ve Desenler	
	9	Doğa ile Malzeme Bağlantısı	<p>OYUN ALANI</p> <p>Yedil Alan</p> <p>KAYIRAK</p> <p>TİKANMAN</p> 
	10	Karmaşıklık ve Düzen	<p>FARKLI AĞAÇ ÇEŞİTLERİ</p> 

İZMİR EKONOMİ ÜNİVERSİTESİ\_Gülfem ERGÜNEŞ KÜTÜK  
SOSYAL BİLİMLER ENSTİTÜSÜ\_TASARIM ÇALIŞMALARI YÜKSEK LİSANS PROGRAMI (2019) sayfa\_03/04

**Figure 5.50** Observation Sketch Form: This form is to be used by the designer.

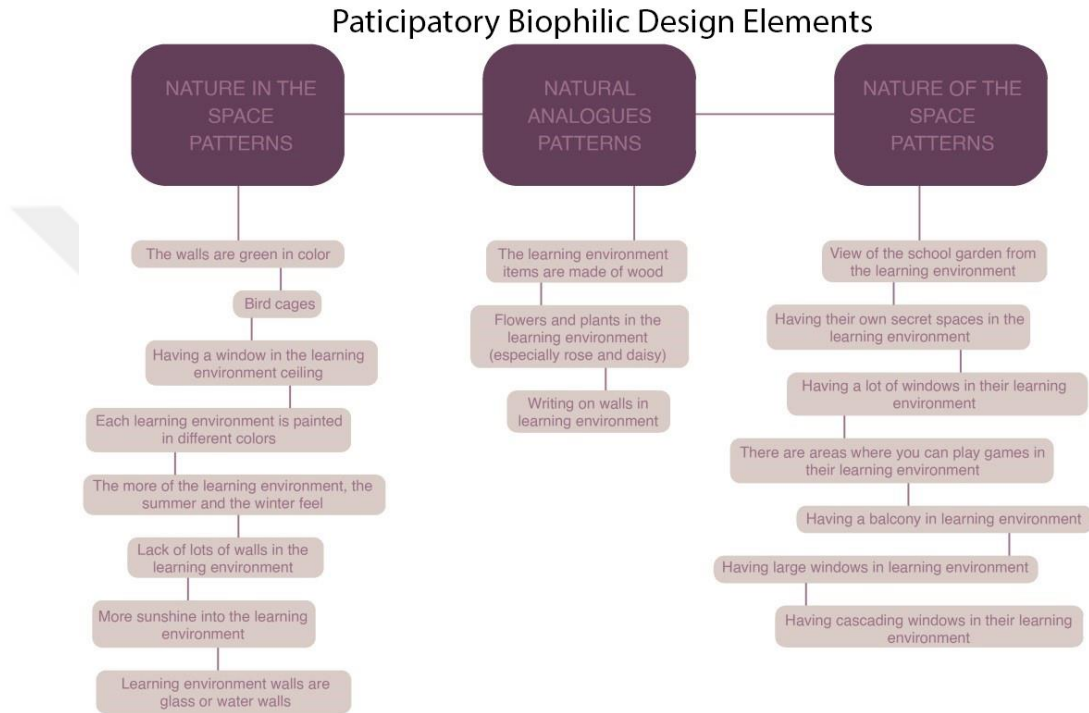


14 BİYOFİLİK TASARIM ÖGELERİ_TASARIMCIDAN KAYNAK FORMU			
OKUL ADI:	BADEMCELİ KÖYÜ KOLEJİ		GÖZLEM TARİHİ:
ANA GRUP	ADIMLAR	ADIM AÇIKLAMASI	ESKİZLER
 UZAY DESENLERİNİN NİTELİĞİ	11	Olasılık	
	12	Sığınak	
	13	Gizem	
	14	Risk/Tehlike	
İZMİR EKONOMİ ÜNİVERSİTESİ_ Gülferi ERGÜNEŞ KÜTÜK SOSYAL BİLİMLER ENSTİTÜSÜ_TASARIM ÇALIŞMALARI YÜKSEK LİSANS PROGRAMI (2019) sayfa_04/04			

**Figure 5.51** Observation Sketch Form: This form is to be used by the designer.

### 5.7 Model for Biophilic Participatory Approach

In this section, according to the 14 patterns of biophilic design, a model proposal is presented in accordance with the results of the workshop. Ten children in the workshop often offered common wishes in the learning environment of their imagination. Accordingly, a general evaluation of the statements of what ten children wish for in the learning environment of their imagination and a biophilic participatory approach was proposed (See Figure 5.52).



**Figure 5.52** Participatory Biophilic Design Elements

As stated in the design proposal model above, children wanted to see Nature in the Space Patterns, which is the sub-title of the 14 patterns of biophilic design, almost all of them in the same way in their imagination. Children wanted to see the learning environment walls in a colorful way. They said that they wanted to see the learning environment walls in a colorful way. They said that they wanted to see the green color and red color of the tree. Some children stated that it would be better to have different colors in each learning environment. In addition, while some children said that the walls should not be too large in the learning environment, others wanted the walls of the learning environment to be glass. At the same time they wanted to flow water from the walls. Children also wanted to have bird houses in their imaginary learning environment. In this way, they said that they could hear sounds like they were in nature. They wanted to see more

traces of summer and winter in their learning environment. The children, who said that daylight should be more in the learning environment, asked for the windows of the daylight in the learning environment ceilings.

As a result of the answers given to the subtitles in Natural Analogues Patterns which are the other subtitles, the general requests of ten children were determined. According to this, the general wish of the ten children is to have flowers and plants in the learning environment of their imagination. At the same time, they want the materials used in the learning environment to be made of wood. They also want to be able to write on the learning environment walls. In this way, children will not be restricted to walls in the learning environment and will be able to progress their own development.

In the last subheading of the biophilic design, Nature of the Space Patterns, the ten children used different expressions. According to this, children want to see the garden from their imaginary environment, and for this reason, they stated that they want the windows to be large or very large. At the same time, they wanted a balcony in their learning environment so that the garden could be seen more clearly in the learning environment and friends of different age groups could see more clearly. Others said that the windows should be cascading. Apart from these, children wanted to have their own secret spaces in their learning environment and also to play areas where they could play their own games.

In line with these results, these three features, which are the subheadings of the 14 patterns of biophilic design, have the common point that children express their affinity to nature, sometimes indirectly and sometimes clearly. Children dream of seeing the general traces of biophilic design in their learning environment. According to this, the nature-human relationship, which is the main expression of biophilic design, is supported by the statements of ten children.

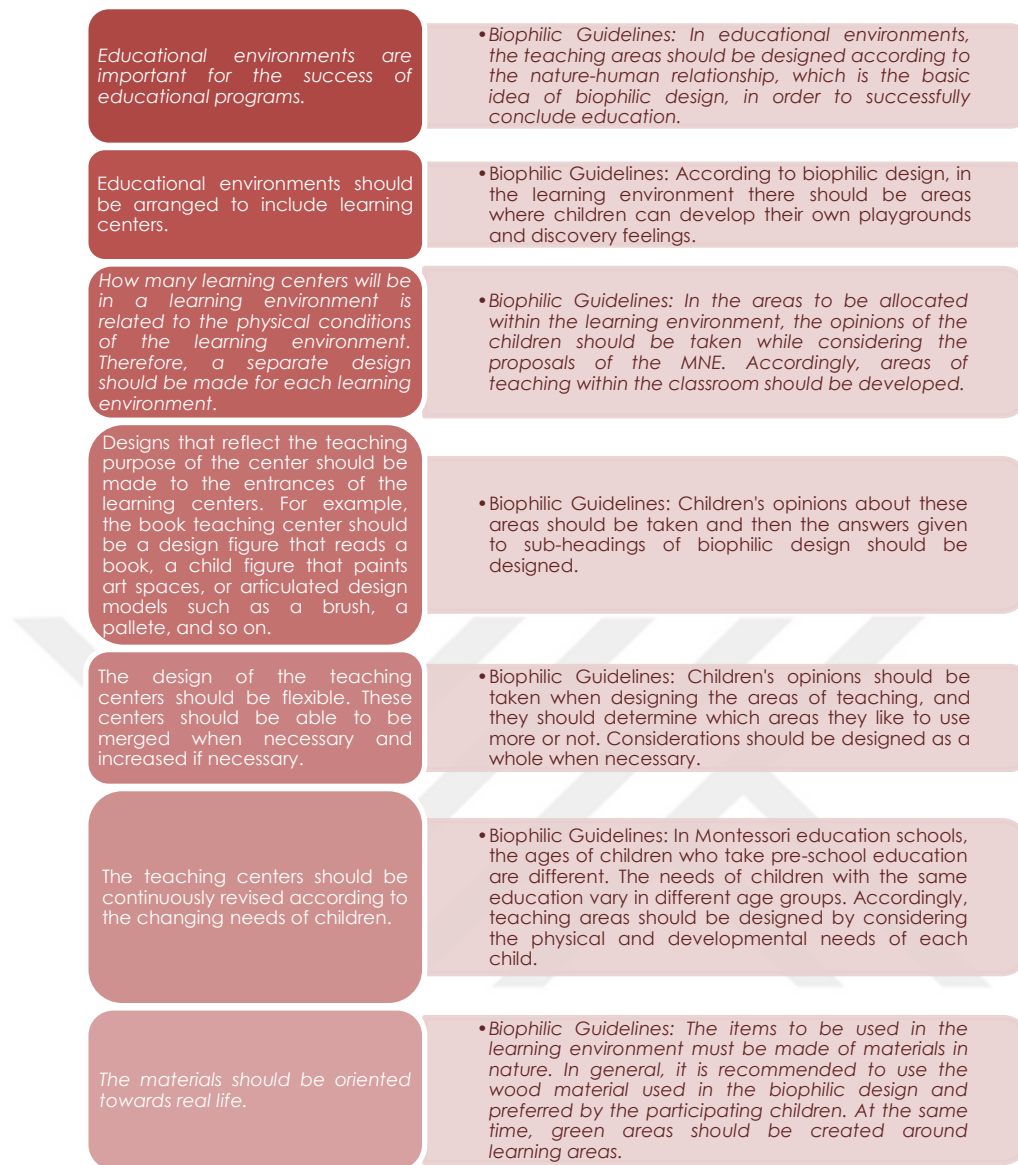
### **5.8 Proposals for the Design of Learning Environments**

In this section, based on the three main characteristics of the 14 patterns of biophilic design, some design suggestions are presented for learning environments in accordance with the results obtained from ten children. While presenting these suggestions, the MNE guidelines regarding learning areas were taken into account.

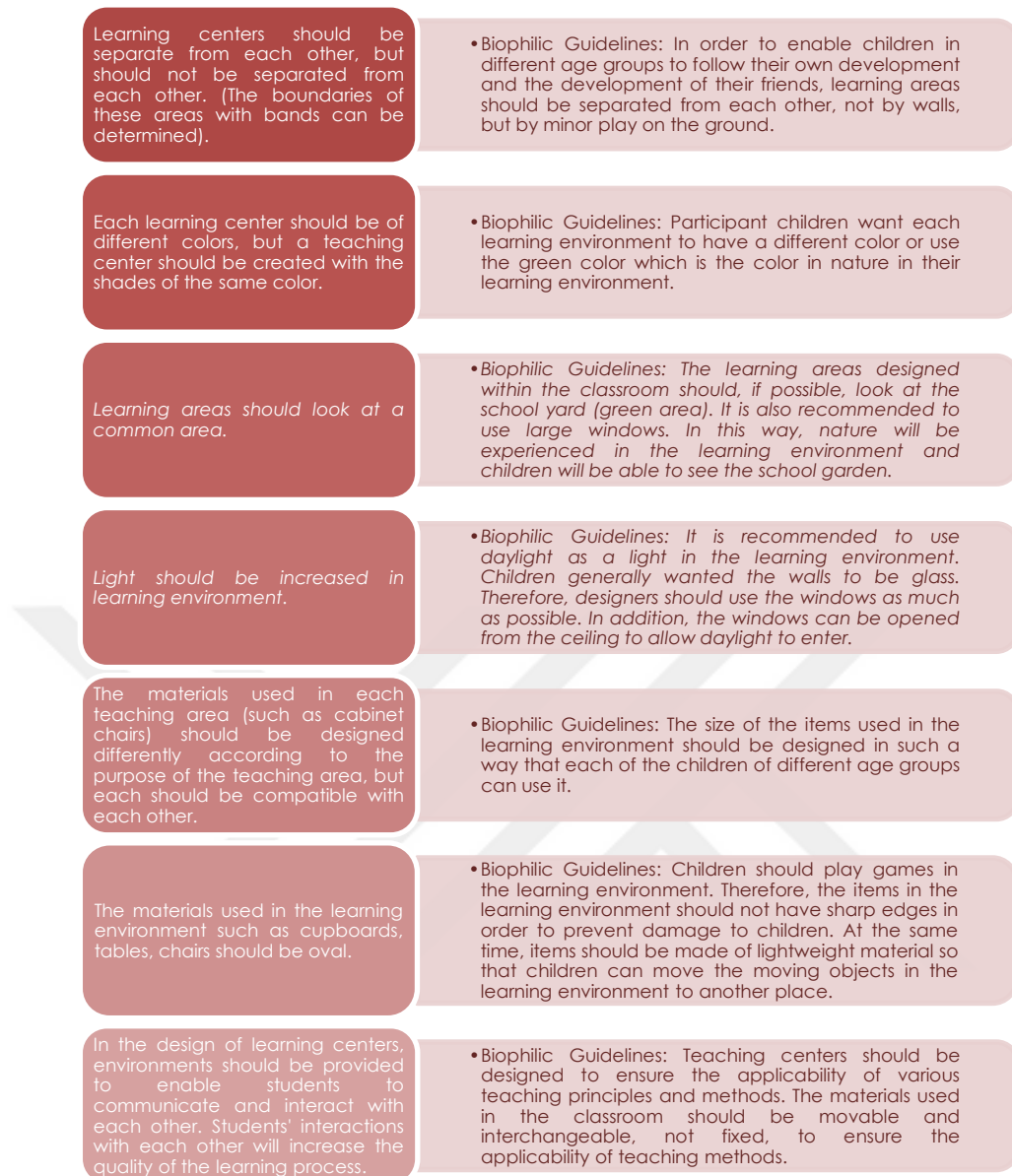
The MNE gives importance to the materials used in the learning environment model that it proposes. The designers must use non breakable glass in doors and windows. The opening of the window and the door should not limit the movement of the child in the learning environment. The furniture used in the learning environment must be healthy and low-maintenance materials. The Ministry of National Education did not use a clear statement of materials to be used. However, in the Natural Analogues Patterns feature of the biophilic design, it is stated that the items in the learning environment should be wood. Based on this, Natural Analogues Patterns show parallelism with the material style proposed by the Ministry of National Education. At the same time, MNE recommended that there should be plenty of daylight in the learning environment. The Nature of the Space Patterns feature of the biophilic design argues that the learning environment should benefit from daylight. This approach is in line with the characteristics of biophilic design. At the same time, the MNE stated that the class window should be used as a door and at least one of these doors should be opened to the garden. Similarly, the three main characteristics of biophilic design are that the class must be a whole with the garden.

The recommendations of the MNE and the biophilic design guidelines obtained as a result of research for pre-school education areas are as follows;





**Figure 5.53** Recommendations of the MNE and the Biophilic Design Guidelines



**Figure 5.54** Recommendations of the MNE and the Biophilic Design Guidelines

## **CHAPTER 6**

### **CONCLUSION**

This research, in the design process of the children who have been educated in Montessori preschool education institution, in accordance with the information they have given, has introduced design proposals for biophilic centered education areas in participatory design. In addition, this study examined the place of biophilic design in montessori education and looked at children's connections with nature. A design proposal was introduced, aiming to contribute to pre-school education areas and the formation of the participatory process. In addition, it presents the design proposals for MEB's pre-school education model. At the same time, children were given a central role and were given the opportunity to design their own learning environments. In this way, the research aims to raise awareness of the importance of well-designed areas of education and the impacts on children. On the other hand, participatory design is useful for students to learn more about their experiences and needs in the field of learning through democratic, emancipatory and empowering research and to increase efficiency in the field of learning.

The aim of this study was to understand the need for biophilic approaches in preschool learning environments. Give children a voice about their learning environment and need for biophilic elements. Build a proposal for a biophilia-based preschool education class with participatory approaches for children aged 2-6. To examine the place of biophilic design in the world and Turkey, to look at the connection of children with nature, and propose model to bring biophilic design and participatory design together within the MNE model. When both literature review and experimental study are examined, these goals are generally achieved. However, although the design proposals in pre-school education schools are based on literature and workshop results, these recommendations need to be specifically tailored and embodied in each school center.

Although biophilia and biophilic design are not new concepts, there is a need for more empirical studies in this area. Moreover, biophilic design is proposed to be developed alongside participatory design, as both are inclusive approaches that aim to connect human beings among themselves and with nature. The research study aimed to combine biophilic design and participatory approaches in learning environments, which had not been done before.

Children's participation in pre-school education begins with the elimination of deficiencies in learning areas and children's participation first begins with defining the problem in the discoveries made about the area. Depending on the missing design problems, the methods to be used in the participatory process should be determined correctly. Design deficiencies were determined in line with the questionnaires, interviews and observations and information obtained from the case study.

In order to understand the children's ideas and ideas about their habitats, one should first look at their spatial perceptions. The famous child psychology research Piaget (1929), with the results obtained from his research on children, states that the most important factor for children to perceive spaces is mental development and ages. For this reason, the case study was carried out with the participant children selected from the 5-6 age group. Children exhibit a discovery in nature. At the same time they create their own learning styles in nature (Thompson and Thompson, 2007). As a result of the researches conducted today, it is observed that the external environments and nature have a positive effect on the learning and developmental characteristics of the children in the early childhood period (Rivkin, 1995). For this reason, the connection of the children with the nature in the existing learning areas was examined. In the case study, the questionnaire form prepared by considering 14 patterns of biophilic design in the selected school and the design sheets supporting this, the children made their own decisions about what should be in their own learning environments. With this method, it is determined whether the children want to see the materials they want to be used in the learning environments, the adequacy of daylight, the sounds, textures and odors that exist in their learning environment. Except this, the implementation of the Montessori approach, its physical order, its materials and the mission of the teacher differ from the programs in our country. In Montessori the environment is prepared by the teacher but is constantly revised according to the needs of the children. After working with materials,

children know where to put it. The materials to be given to the child in Montessori are expected to represent the real life. However, given the preschool education institutions in our country, such a class order or the realism of materials is not very common (Özbek-Ayaz, 2017). Therefore, this study may contribute to the elimination of this general deficiency and raising awareness in Montessori education areas carried out under the MNE in Turkey. At the same time, the fields identified in the learning environment model proposed by the MNE can be developed in accordance with the results obtained from 14 patterns of biophilic design.

This study determined the general needs of children in learning areas as a result of using biophilic features in participatory design. Accordingly, biophilic feature in participatory design, its place in the field of education and approaches to the subject were reviewed in the literature. In addition to general literature review, in Turkey and in the world for research on pre-school education were examined. As a result of the literature review, a questionnaire form consisting of 14 patterns of biophilic design was prepared for the determined student group. The biophilic design form, which consists of three main sections and 14 sub-sections, has been prepared in the language that children can understand. With the answers to the questions, opinions of each children were taken. In addition, a design sheets was designed supporting questionnaire form. Design sheet study was carried out with each student and the features in the questionnaire form were concretized. At the same time, each student was asked to place the visualized form of the pattern 14 of the biophilic design in the design sheet. Thus, it was tried to obtain healthier data by comparing the opinions on the questionnaire form with the design sheets. Apart from these, the physical characteristics of the research area have been observed in order to understand how children use the school garden and learning environment where they spend their time. When the general result of the study is examined, a parallel between the answers given by the children to the questionnaire form and the design sheet drawings is made. Children wanted to be able to see three characteristics of biophilic design and 14 sub-features in schools and learning environments.

According to the research results, design suggestions for pre-school education learning environments should be discussed and concretized. We need to make accurate discoveries of the areas where children spend their time, and in this way, the areas where children spend their time need to be designed in a correct

and functional way, strengthening their ties with nature. Most children spend most of their time in schools. Therefore, designers need to pay attention to learning areas that will strengthen children's connection with nature. Children should be given a say in the design of the learning environments where they will spend all day. These areas should be formed in line with the wishes and desires of children. At the same time, in line with the developing and changing educational needs, continuous researches should be made depending on the participatory approach models and the design suggestions should be changed and renewed when necessary. In addition, research should be conducted to create small-scale design proposals for each school.

As a result of this study, it may be necessary to increase the number of students in order to develop the findings obtained in future studies. At the same time, experts from different disciplines such as psychologists can be involved in the case study. Questionnaire and design sheet prepared from 14 patterns of biophilic design can be developed in accordance with the views of these experts to obtain different information. Recommendations against this can be developed. In order to strengthen their ties with nature, the learning areas in which they spend their time should be designed in line with the principle of biophilic design and thus, the principle of biophilic design should be instilled in children. Some materials used in learning areas should be reminiscent of children's nature. At the same time, in line with the developing and changing educational needs, continuous researches should be made depending on the participatory approach models and the design suggestions should be changed and renewed when necessary. Further studies may include: Larger samples sizes, comparisons with different educational models in Turkey and internationally, comparisons with schools in other cities in Turkey that apply the MNE model, elaboration of the Biophilic-Participatory model with a closer consideration of layouts, materials, and application techniques.

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## APPENDICES

### APPENDIX A: MEB PERMISSION FORMS



T.C.  
İZMİR VALİLİĞİ  
İl Millî Eğitim Müdürlüğü

Sayı : 12018877-604.01.02-E.8231985  
Konu : Araştırma İzni

25.04.2019

Sayın: Gülfem ERGÜNEŞ KÜTÜK  
İzmir Ekonomi Üniversitesi Sosyal Bilimler Enstitüsü  
Sakarya Caddesi, No:156 35330 Balçova - İZMİR

İlgi: : a) MEB Yenilik ve Eğitim Teknolojileri Genel Müdürlüğünün 22/08/2017 tarihli ve 355862610.06-E.12607291 sayılı yazısı (Genelge 2017/25)  
b) 09/04/2019 tarihli dilekçeniz.  
c) Valilik Makamının 24/04/2019 tarihli ve 8190792 sayılı Onayı.

Müdürlüğümüz Urla İlçesi Bademler Köyü Koleji, Balçova İnciraltı Montessori Anaokulu'nda "Çocukların Katılımı ve Biyofilik Okul Öncesi Öğrenme Ortamları" konulu tez çalışmanız için kullanacağınız ölçekleri uygulama isteğiniz ilgi (c) Valilik Onayı ile uygun görülmüştür.

Araştırmanın tamamlanmasından itibaren en geç iki hafta içinde Araştırmanın Teslimine İlişkin Taahhütname Tutanağı doldurulup, araştırmanın CD'ye aktarılması sağlanarak Müdürlüğümüze gönderilmesi gerekmektedir.

Bilgilerinizi ve gereğini rica ederim.

İlker ERARSLAN  
Müdür Yardımcısı

Ek:  
1- Valilik Onayı (1 sayfa)  
2- Araştırma Değerlendirme Formu  
3- Anket Formları  
4- Taahhüt Formu

Adres: Fevzipaşa mh. 452 sk. no:15 Konak /İZMİR  
Elektronik Ağ: izmir.meb.gov.tr  
e-posta: strateji35\_1@meb.gov.tr

Bilgi için: Nihal GÜR  
Tel: 0 (232) 280 36 31  
Faks: 0 ( ) \_\_\_\_\_

Bu evrak güvenli elektronik imza ile imzalanmıştır. <https://evraksorgu.meb.gov.tr> adresinden 10dd-6316-3621-8821-07a3 kodu ile teyit edilebilir.



T.C.  
İZMİR VALİLİĞİ  
İl Millî Eğitim Müdürlüğü

Sayı : 12018877-604.01.02-E.8190792  
Konu :Gülfem ERGÜNEŞ KÜTÜK'ün  
Araştırma İzni

24/04/2019

VALİLİK MAKAMINA

İlgi :a) MEB Yenilik ve Eğitim Teknolojileri Genel Müdürlüğünün 22/08/2017 tarihli ve 355862610.06-E.12607291 sayılı yazısı (Genelge 2017/25)  
b)Gülfem ERGÜNEŞ KÜTÜK'ün 09/04/2019 tarihli dilekçesi.

İzmir Ekonomi Üniversitesi Sosyal Bilimler Enstitüsü Tasarım Çalışmaları Programı yüksek lisans öğrencisi Gülfem ERGÜNEŞ KÜTÜK'ün : "Çocukların Katılımı ve Biyofilik Okul Öncesi Öğrenme Ortamları" konulu tez çalışması için kullanacağı ölçekleri, Müdürlüğümüz Urla İlçesi Bademler Köyü Koleji, Balçova İnciraltı Montessori Anaokulu'nda uygulama isteği ilgi (b) yazı ile belirtilmektedir.

Söz konusu ölçeklerin uygulanmasının, adı geçen okullarda 2018-2019 Eğitim öğretim yılında eğitim öğretimi aksatmayacak ve eğitim kurumu yöneticilerinin uygun gördüğü şekilde yapılması Müdürlüğümüzce uygun görülmektedir.

Makamlarınızca da uygun görüldüğü takdirde olurlarınıza arz ederim.

Ömer YAHŞİ  
Millî Eğitim Müdürü

Ek:  
1-Araştırma Değerlendirme Formu  
2-Anket Formları

OLUR  
24/04/2019  
Ahmet Ali BARIŞ  
Vali a.  
Vali Yardımcısı

Adres: Fevzipaşa mh. 452 sk. no:15 Konak /İZMİR  
Elektronik Ağ: izmir.meb.gov.tr  
e-posta: stratiji35\_1@meb.gov.tr

Bilgi için: Nihal GÜR  
Tel: 0 (232) 280 36 31  
Faks: 0 ( ) \_ \_ \_ \_

Bu evrak güvenli elektronik imza ile imzalanmıştır. <https://evnaksorgu.meb.gov.tr> adresinden 4787-c6b4-3030-ac6a-1ac5 kodu ile teyit edilebilir.

T.C.  
İZMİR VALİLİĞİ  
İl Millî Eğitim Müdürlüğü

**ARAŞTIRMA DEĞERLENDİRME FORMU**

ARAŞTIRMA SAHİBİNİN	
Adı Soyadı	Gülfem ERGÜNEŞ KÜTÜK
Kurumu / Üniversitesi	İzmir Ekonomi Üniversitesi Sosyal Bilimler Enstitüsü Tasarım Çalışması Programı
Araştırma yapılacak iller	İzmir
Araştırma yapılacak eğitim kurumu ve kademesi	Bademler Köyü Koleji (Urla) İnciraltı Montessori Anaokulu (Balçova)
Araştırmanın konusu	Çocukların Katılımı ve Biyofilik Okul Öncesi Öğrenme Ortamları
Üniversite / Kurum onayı	---
Araştırma/proje/ödev/tez önerisi	Çocukların Katılımı ve Biyofilik Okul Öncesi Öğrenme Ortamları (Yüksek Lisans Tezi)
Veri toplama araçları	Biyofilik Tasarım Öğeleri-Tasarımcıdan Kaynak Formu
Görüş istenilecek Birim/Birimler	----
KOMİSYON GÖRÜŞÜ	
<b>İlgi:</b> Millî Eğitim Bakanlığı'nın 22/08/2017 tarihli ve 3558626-10.06-e.12607291 sayılı Araştırma, yarışma ve Sosyal Etkinlik İzinleri Konulu, 2017/25 Sayılı Genelgesi. Genelge gereğince; araştırma başvurusu olması gereken nitelikler açısından incelenmiş olup, araştırmanın 2018-2019 öğretim yılında eğitim öğretimi aksatmayacak ve eğitim kurumları yöneticilerinin uygun gördüğü şekli ile yapılmasına oybirliği ile karar verilmiştir.	
<b>Komisyon Kararı</b>	Oybirliği ile alınmıştır.
<b>Muhalif üyenin Adı ve Soyadı:</b> ----	<b>Gerekçesi;</b> -----

**KOMİSYON**

17./04/2019

  
(Başkan)  
Beyhan  
GÖKDEMİR  
Şube Müdürü

  
Üye  
Nurdan  
MARAL  
Öğretmen

  
Üye  
Selahattin  
ANIK  
Öğretmen

  
Üye  
Özlem  
GÖRÜR  
Öğretmen

  
Üye  
Aslı  
DEMİREL  
Öğretmen

  
Üye  
Yasin  
KAYIŞ  
Öğretmen

## APPENDIX B: BADEMLER VILLAGE MONTESSORI COLLEGE PERMISSION FORMS

### “Çocukların Katılımı ve Biyofilik Okul Öncesi Eğitim Çevreleri” Tez Çalıştayı

#### Katılımcı Bilgilendirme ve İzin Formu

Bu araştırma, İzmir Ekonomi Üniversitesi, Sosyal Bilimler Enstitüsü-Tasarım Çalışmaları Programı Yüksek Lisans öğrencisi Gülfem Ergüneş Kütük tarafından ve Doç. Dr. Deniz Hasırcı danışmanlığındaki, “Çocukların Katılımı ve Biyofilik Okul Öncesi Eğitim Çevreleri” başlıklı yüksek lisans tezi kapsamında yürütülmektedir. Çocukların, eğitim çevrelerine tasarım anlamında katılımlarını amaçlamaktadır.

#### Çalışmanın Amacı Nedir?

Çalışmanın amacı, katılımcıların genel ve işe yönelik tutum ve eğilimleriyle ilgili bilgi toplamaktır.

#### Bize Nasıl Yardımcı Olmanızı İsteyeceğiz?

Çalışmaya katılmayı kabul ettiğiniz takdirde, okul öncesi eğitim alan 10 ila 15 çocuk katılımcılara araştırmanın konusuna dahil, çocukların anlayabileceği oyun mantığında bir çalıştay uygulanacaktır. Yaklaşık olarak 1-2 saat sürmesi planlanan bu katılımcı çalıştayda çocukların sınıf öğretmenlerinin kontrolünde bilgiler alınacaktır. Yapılan çalıştay sırasında içerik analizi ile değerlendirilmek üzere çocuk öğrencilerin ses kaydı, video kaydı, ve fotoğrafları çekilecek, ancak yayınlarda tüm katılımcıların anonimliği sağlanacaktır.

#### Çocuklardan Topladığımız Bilgileri Nasıl Kullanacağız?

Araştırmaya katılımınız tamamen gönüllülük temelindedir. Cevaplarınız gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilecektir. Katılımcılardan elde edilecek bilgiler toplu halde değerlendirilerek bilimsel yayınlarda kullanılacaktır.

#### Araştırmayla ilgili daha fazla bilgi almak isterseniz:

Araştırma sonunda, bu çalışmayla ilgili sorularınız cevaplanacaktır. Bu çalışmaya katıldığımız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi almak için İçmimarlık ve Çevre Tasarımı öğretim üyesi Doç. Dr. Deniz Hasırcı (Oda: D 537, Tel: 0232 4885306, E-posta: deniz.hasirci@izmirekonomi.edu.tr) ya da yüksek lisans öğrencisi Gülfem Ergüneş Kütük (Tel: 0537 9124752, E-posta: gulfemergunes@hotmail.com) ile iletişim kurabilirsiniz.

*Çalışmaya katılan çocuklar, okul onayı ile gönüllü olarak katılmışlardır. Verilen bilgileri/çalıştay bilimsel amaçlı yayınlarda kullanılmasını okul olarak onaylamaktayız.*

İsim Soyad

*Anıl YALGIN*

Tarih

*29.05.2019*

İmza

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