ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF ARTS AND SOCIAL SCIENCES

USING VISUAL RESEARCH METHODS TO UNDERSTAND PERCEPTION OF CONCRETE IN INTERIOR

M.A. THESIS

Beren SEYMEN

Department of Interior Design

International Master of Interior Archtectural Design M.A. Programme

JUNE 2019

ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF ARTS AND SOCIAL SCIENCES

USING VISUAL RESEARCH METHODS TO UNDERSTAND PERCEPTION OF CONCRETE IN INTERIOR

M.A. THESIS

Beren SEYMEN
(418161002)

Department of Interior Design

International Master of Interior Archtectural Design M.A. Programme

Thesis Advisor: Assoc. Prof. Ervin GARİP

JUNE 2019

İSTANBUL TEKNİK ÜNİVERSİTESİ ★ SOSYAL BİLİMLER ENSTİTÜSÜ

GÖRSEL ARAŞTIRMA METOTLARI İLE İÇ MEKANDA BETON ALGISININ DEĞERLENDİRİLMESİ

YÜKSEK LİSANS TEZİ

Beren SEYMEN

(418161002)

İç Mimari Tasarım Anabilim Dalı

İç Mimari Tasarım Uluslararası Yüksek Lisans Programı

Tez Danışmanı: Doç. Dr. Ervin GARİP

HAZİRAN 2019

Beren Seymen, a M.A. student of ITU Graduate School of Arts and Social Sciences student ID 418161002, successfully defended the thesis entitled "Using Visual Research Methods to Understand Perception of Concrete in Interior", which she prepared after fulfilling the requirements specified in the associated legislations, before the jury whose signatures are below.

Thesis Advisor : **Assoc. Prof. Ervin GARİP** .....
İstanbul Technical University

Jury Members : **Assoc. Prof. Mehmet Emin ŞALGAMCIOĞLU** .....
İstanbul Technical University

Asst. Prof. Armağan Seçil MELİKOĞLU EKE .....
İstanbul Kültür University

Date of Submission : 03 May 2019
Date of Defense : 13 June 2019

To my mom and dad,

FOREWORD

First of all, I would like to thank my parents for their endless support, limitless understanding for every issue that I decide and their immense trust for everything that I want. Without them, I wouldn't be the one who was always willing to learn and fighting to do better.

Secondly, I would like to thank and express my gratitude to my thesis advisor Assoc. Prof. Ervin Garip, for his understanding, support, patience, help, positive approach and sincerity. Despite the distances, I am always grateful for that he helped me to learn more and more with constructive feedbacks. I would never be able to finish my thesis without his valuable guidance.

I would like to thank to TED Trabzon College Primary School Principal Burcu Gülsoy, Primary School Assistant Principal Arif Asan and Özge Bektaş Gümrükçü for their contribution and support in my field study.

I would like to thank my friend Dilay Seda Özgen for her support and helps and all my friends especially Fırat Mutlu Akgün, Esra Erdoğan, my uncle Cahit Seymen. I am grateful for their help and encouragement through the thesis process.

July 2019 Beren Seymen

TABLE OF CONTENTS

Page

ABBREVIATIONS

İSMEP **:** İstanbul Sismik Riskin Azaltılması ve Acil Durum Hazırlık Projesi
ESMDSG : Educational Structures Minimum Design Standars Guidelines
GEN **:** General Evaluation
VIS **:** Visual Evaluation
TAC **:** Tactile Evaluation
DEP **:** Design Educated Participants
NDEP : Non-Design Educated Participants
VR **:** Virtual Reality
OCD **:** Ordinary Classroom Design
CDCD **:** Concrete Dominantly Classroom Design

LIST OF TABLES

Page

LIST OF FIGURES

Page

USING VISUAL RESEARCH METHODS TO UNDERSTAND PERCEPTION OF CONCRETE IN INTERIOR

SUMMARY

This study aims that understand and analyse the effects of material on user perception and evaluate perception of concrete in interior environments. The principle of perception, its relation with the material in terms of interior architecture and the visual research methods have led to this study. Concrete and perception is evaluated together to consider contemporary and new understanding of architecture. To support the field study idea, learning environment is researched in terms of physical properties and its' effects on children perception. To compare the prejudices about the unusual material in interior spaces, primary school children who are in the beginning period of perceptual development and not have judgement ability are taken into consideration. The preliminary study is researched with a photo from the school that have been designed within in the scope of ISMEP project because 44 schools and their design provide great opportunity to investigate perception- material relation. The evaluation of new designed schools and the perception of users have essential role for society and also these spaces where they directly related to each other. To understand the perception of concrete material, questionnaries were selected from the same perceptual development period (18-24 years) however they were in two groups that are 40 people have design education and 40 people have not. Results were evaluated in terms of preference and analyses were framed by open-ended answers. This preliminary study brought light to experimental study which were researched with the participation of primary school students to understand judgements about the material perception. Experimental study was practiced with 33 students which are 6 years old with the using of virtual reality (VR) methods. Two different classes which were ordinary designed and the other concrete dominantly designed were experienced to children and their answers are examined in preference concept. Contrary to expectations, it is concluded that classroom design and material does not have significant effect on perception of children.

GÖRSEL ARAŞTIRMA METHODLARI İLE BETON MALZEMESİNİN İÇ MEKANDA DEĞERLENDİRİLMESİ

ÖZET

Bu çalışmada malzemenin kullanıcı üzerinde etkisi ve iç mekanda beton malzemesinin algı kapsamında değerlendirilmesi amaçlanmıştır. Algı kavramının iç mimaride malzeme ile ilişkisini ortaya koymak amacıyla görsel araştırma methodları bu çalışmaya yol göstermiştir. Beton ve algı kavramları, mimaride çağdaş ve yeni anlayışlar göz önünde bulundurularak birlikte değerlendirilmiştir. Eğitim çevreleri incelenirken, algı kapsamı ışığında çocukların gelişimiyle ilişkisini araştırmak amaçlanmıştır. Eğitim yapılarının literatür araştırması, standartların malzeme ve fiziksel koşullar ile incelenmesiyle desteklenmiştir. Alışılmışın dışındaki mekanlarla ilgili var olan yargıları karşılaştırmak için, algı gelişimlerinin başında olan ve 'yargı' yetenekleri henüz gelişmeyen ilkokul çocukları göz önünde bulundurulmuştur. Ön çalışmaya, algı ve malzeme ilişkisi konusunda laboratuar ortamı oluşturan, İSMEP projesi kapsamındaki 44 okul ışık tutmuştur. Ön çalışmada, bu proje kapsamında tasarlanan okullardan birinin fotoğrafı katılımcılara gösterilerek veriler toplanmıştır. Yeni tasarlanan bu okulların değerlendirilmesi ve kullanıcı algısı, toplum-mekan ilişkisi için çok önemli bir rol oynamaktadır. Katılımcılar, 18-24 yaş arası, aynı algı gelişim periyodunda olan iki gruptan oluşturulmuştur; bunlar tasarım eğitimi alanlar ve almayanlar olarak belirlenmiştir. 40 tasarım eğitimi alan ve 40 tasarım eğitimi almayan katılımcıları araştırmaya dahil etmekteki amaç, beton malzemesiyle ilgil ön yargıların tasarım eğitimiyle kazanılan bakış açısıyla ve önyargılarla ilgili olup olmadığını algı kapsamında ortaya koymaktır. Sonuçlar, beğeni kapsamında değerlendirilmiş ve açık uçlu sorular kategorize edilerek analiz edilmiştir. Bu ön alan çalışması, malzeme algısında önyargıların etkisinin olup olmadığını araştırma amacıyla oluşturulan deneysel çalışmaya ışık tutmuştur. İlkokul birinci sınıf öğrencilerinden oluşan 33 kişilik deney grubu oluşturularak sanal gerçeklik 'VR' yöntemi ile deneysel çalışma gerçekleştirilmiştir. Mimari ve fiziksel elemanları aynı sınıf tasarımına, malzeme ve dokularla 2 farklı uygulama yapılmıştır. Bu iki sınıf ilkokul öğrencilerine sanal gerçeklik gözlüğü ile deneyimletilerek algısal beğenilerini değerlendirmek ve beton-algı ilişkisini araştırmak amaçlanmıştır. Herhangi bir sınıf yargısı olmayan çocuklarda, sınıf tasarımının mekan algılarına etkisinin yeterli olmadığı gözlemlenmiştir. Çocuklar, gördükleri fiziksel elemanları inceleyerek duygularını ifade etmişlerdir.

1. INTRODUCTION

Physical space is a design that has both physical characteristics and has psychological effects on users which is resulted in experience for users (Mahmoud, 2017). "The mental and psychological effects of architectural frames on human beings have been considered from the early shelters to today´s modern structure." (Tabaeian, 2011). Currently, especially last two decades, interior architecture and spaces affect the human sense in many ways and therefore new developments, technology and material innovations have changed the idea of interior architecture and users' perception. Experiencing and perceiving the space have become one of the most significant issues to design buildings for architects because space has essential and critical effect on people's activities, mood and approach in the environment (Shemesh, Bar & Gobman, 2015). Perception in spaces have had principal impact on users and this causes experimental learning for building. Therefore, design has shown several changes including modernism, production techniques, materials, textures and forms. The contemporary design understanding of interior spaces has become important issue for people's behavior and sense rather than ordinary design. To try and explore new things in spaces can provide satisfied result for forms, functions and experience.

The relationship between designer's approach and users' behaviors is one of the most important effects on design concept because designers and architects have tried to differentiate the spaces with different point of views, perspectives and functions. "Space is on one hand the defining organizational model that places all things in relation to each other but which, on a completely different level, can also appear "empty."" (Perren and Mlecek, 2015) Process of perception and movement includes having the information about the space boundaries, building elements and materials in scope of relation between design and user.

Material provides characteristics of design which is significant and key point for designers because material is directly related with the perception and it is one of the main elements for people's psychology (Seçkin, 2010). Spaces can be bordered with

the help of material clearly and transitions, intersection points, architectural elements, solid-void relation and color can be presented to users strikingly. Eye-catching design can be provided easily with the help of material design and perception. With the help of all kinds of design and differences in material user perception can be changed relatively.

Material is also use in many areas to code and identify man-made environment for user because many of researches show that cognitive psychology has proved some subliminal messages which are directly linked with the visuals/pictures in people's brain. Due to the material design in spaces that helps to border identification, coordination, taking attention has become a guide for users in experiencing the environment. 'Functional identification' with the physical features (mostly material) provide opportunity for users to understand the feeling of real or imaginary environment and therefore this situation affects their perception (Thornberg, 1973).

The material of spaces also help the users to define planes, textures, combination of different functions and enable users to guide and use the spaces themselves easily. Spaces have started to became an object that only shows itself in a space while satisfy functional needs. Therefore, contemporary design can easily show itself with the striking, artificial but pure space perception with the material.

The relation between concrete and perception is the new discussion topic that adapt modern and contemporary understanding with the increase of different architectural perspectives. While the usage of concrete in interior architecture had been becoming widespread, there are many different ideas that are emerged about exposed concrete. The main cause of the division of opinions is that the perception of space is in direct relation with user psychology. Material and the feeling that it creates have fundamental role on psychology.

Different building types have different requirements and these requirements have some stereotypical remarks on people. The material and physical features directly affect users' perception, movement, activities, mood and psychology. The design of educational building has also essential impact on society. Different functions and needs have to be answered carefully because children's psychology and cognitive development also have significant role for the future of communities. Children's

environment where they are growing up has fundamental impact on their mental development.

In Turkey, after Republic, number of modern educational buildings have been increased and 'Type Project (tip proje)' have been enhanced by the government. There are increasing leanings about standardization of schools because certain parts of people support that this uniformity will prevent creativity and thoughts for children who are in the most important process of perception development.

The project of İSMEP (İstanbul Sismik Riskin Azaltılması ve Acil Durum Hazırlık Projesi- Seismic Risk Reduction and Emergency Preparedness Project) provides a laboratory environment to experiment the relationship between user perception and school environment in terms of material selection. This provides an opportunity to make comparison and evaluate the prejudices. Within the lead of this project, preliminary study and experimental study were formed to support the idea. Preliminary study created to make comparison for concrete prejudices and its relation with the design education. Therefore, quastionnaries were consist of 2 grouops which have design education and not. A photo which is concrete dominantly and doesn't have traces about building type from İSMEP project were selected and participants' subjective opinions were asked. In the second step, experimental study have created with the 6-7 years old students to research material perception with who are in the beginning of perceptual process. This study aimed to have finding about children perception and preference about the interior design.

1.1. Objectives

Aim of the study is broadly about to understand both relation and results of material and perception concept together within the scope of environmental psychology and interior architecture. Furthermore, try to express the role of material is not only as a physical element but also as a metaphoric meaning of the material. Objectives of the thesis can be clarified as below.

- To introduce metaphorical and contextual relation between architectural interior spaces and perception

- To make an evaluation about the unordinary spaces and different type of designs in scope of material and user perception
- To examine the effect of concrete in learning environments.
- To evaluate the effect of concrete on spatial perception in learning environment for different user groups.
- To make an evaluation about material perception and education background relation with the help of design educated and non-design educated participants
- To understand material perception with the relation of perception process
- To research concrete perception without experience or prejudice
- Trying to undertand the relation between children perception and learning environment

1.2. Structure of Thesis

For this thesis, theoretical and descriptive approach were used, and the case study is made to support the main idea. In this study which is formed within the framework of 'Spatial Perception' and 'Material' theoretical structure, the concepts of material and perception have been taken into consideration. In the holistic approach, environment, material and perception notions are analyzed.

This research contains four chapters. First chapter is a brief introduction of taking place in the scope of spatial perception and relationship between material and perception. Second chaper is including description onf perception in ters of space, material and children to understand psychological processes. In chapter 3, importance and process of the concrete as a material in construction sector and its physical characteristics as well as for interior architecture were researched. In chapter 4, the school environment was defined in order to support and understand educational structure where the field study was conducted. Field study, findings and evaluations have taken part in chapter 5. In this study, the survey method was used and open-ended questions, adjectives were evaluated with the Likert scale

Perception concepts as described by Rapoport (1977) and environmental assessment, informatics and perception have been taken into consideration.

The experimental studies on the perception of materials by Wastiels, Schifferstein, Wouters, and Heylighen have been guiding. (2013)

Questionnaire study is also conducted to understand of the relationship between material and space perception by using visual research methods. Survey is completed with 80 participants. They consists of two groups which are design educated participants and non-design educated participants. (non-designer, non-educated gibi terimli makaleler okudum) With this differentiation, it is aimed to understand the effects of exposed concrete in architecture and its relation with educational perspective. Same age group of between 18-26 was considered in order to have similar perceptual development.

Experimental study is also completed with 33 primary school children (6-7 years old) to understand perception of concrete without social experience and prejudices. Virtual reality which is one of the visual research method, is used to experience the classroom design in simple and pleasant way. The children who are in the beginning of their perception process according to Piaget (1956) are conducted to participate and compare ordinary classroom design and concrete dominant classroom design without any previous 'classroom judgement'

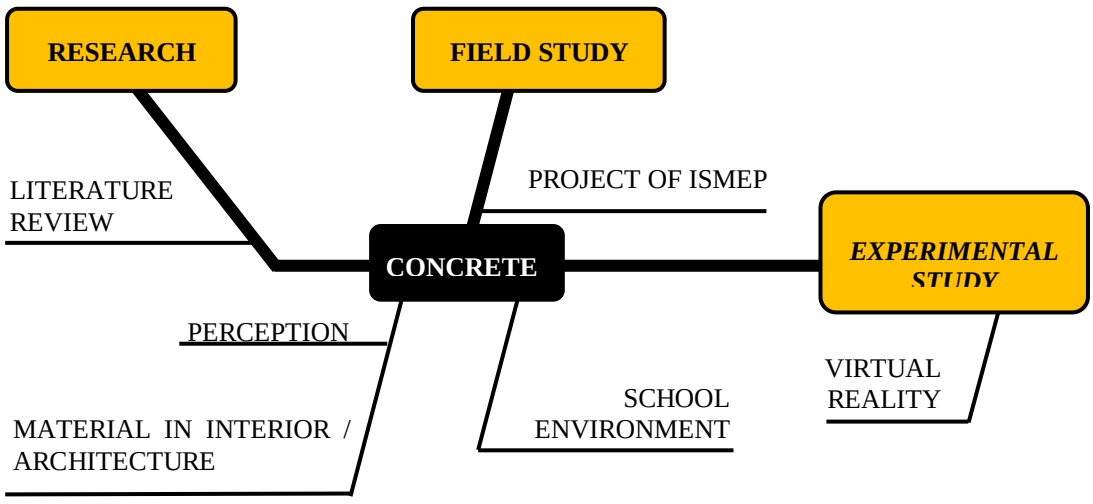


Figure 1.1: Diagram of the thesis.

This thesis provides concrete results for future studies and also contributes to create more qualified environments as research example with different concepts for

educational environments. The research presents experimental findings with the help of different parameters of concepts that are material, perception, children and interior design. Therefore for the future studies,

2. SPATIAL PERCEPTION IN LEARNING ENVIRONMENT

Perception is in direct relationship with the human responses and senses in the process of being aware of the environment. It's the junction point of the cognition and the truth (Lang, 1987). The notion of perception is being in relationship with the environment with the help of senses like seeing, hearing, smelling, touching and tasting. Furthermore, structural environment have contributed to understanding and knowing process actively while personal differences and socio-cultural norms are creating basic elements of perception process. (Ünlü, 1998)

Perceptual fiction is a process and some norms like grouping, meronymy-holonymy (part-whole relationship), and shape-background relationship have helped this process. Many notion like proximity, similarity, enclosure, continuity, closeness, relationality, dependence, dimension, motion, symmetry, distance have been formed by psychological influences in the brain during the perception process. (Ittelson, 1976) Gestalt's visual perception theory has underpinned basics of the concept.

Material also one of the main factors that affect both architectural process and also user experience. While shaping the design, people's feelings and senses are also formed. Therefore, spatial perception is in direct relationship with the material because of its visual contribution.

Perception concept have developed according to physical, biological and sensory factors. Piaget explained perception of children according to their physical and psychological processes. Environmental factors affect to perceive the space, their thoughts, movements and senses for children.

2.1. Perception and Space

People are not independent from spaces and therefore human psychology is affected by spaces. (Arslanoğlu, 2017) Process of perception is starting with the personal factors like thoughts, memory, imagination and it continues with the help of senses from environment for taking action. Perception is a cognitive event that is why it is not only an information that gained with all senses (Gifford, 2002). Perception establishes

connection between space and human and it is perceived and discovered real. Visual environment and perception enable the user to be in contact with the place and turn into actions such as direction, finding, experiencing and responding by building bridge between itself and individuals. (Figure 2.1, Pop 2013) 'The average human is exposed to more than 5000 pictures per day' (Alawadhi, 2010). Perception is mostly starting with the seeing and it continues with the help of different parameters. As it can be seen in figure 2.1 (Pop,2013), perceived space throught senses results in perception of space with the effect of previous experiences such as thought, memory, imagination. Therefore, previous experiences affect spatial perception in many different ways with different senses which can differentiate the responses from the situation of the person in experience process.

Perception of space is not only in direct relationship with the user but also have affected on the mood of people in a space and also a process that changes the existing mood relation with the environment.

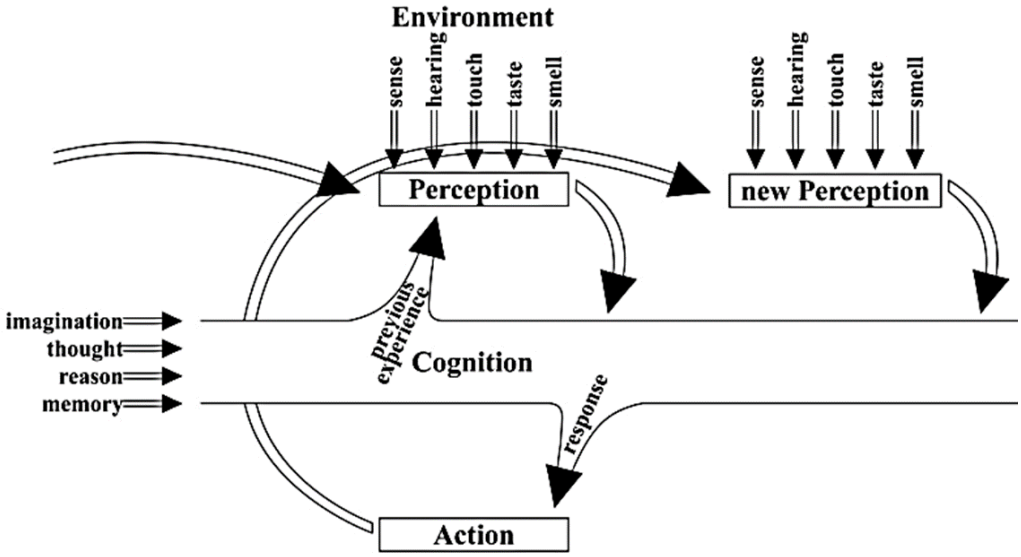


Figure 2.1: Space Perception (Pop, D.,2013).

In spatial perception, some variables such as past experiences, cultural backgrounds, thoughts, imaginations, memories have significant impact on the process of perception and cause changes. While effects of previous experiences is continuing, environmental factors like senses, hearing, touching, tasting and smelling also affect perception-action process. (Figure 2.1) This situation increases effect of the user on design and demonstrates that designers should take into consideration to perceptual components.

Spaces have broken off from their designers while becoming reality with the user, this is resulted in discrepancies in the perception of process.

Considering the sense of seeing in spatial perception, while concepts such as material, color and pattern are distinguished the process in the brain leads to perceptual differences by shaping their psychology, season, climate, mood of users. The senses of smell, hearing, touching, tasting have effects on the process as well. For example, with the sense of smelling, old memories may be remembered and different things may be felt. However, in another day, if that smell is not catched, space may be perceived different. Therefore, this brings the perceptual experience into a different state.

In the process of visual perception, individuals experience a superficial acquisition process in relation with perceived notions. This process is a two-dimensional perception. At this stage, indviduals perceive images as width and height however after this step, they start to form a more intimate pattern related to the concept of visual perception. Within this processes, depth perception gets involved with the third dimension. All this process gives the meaning for the concepts with cultural backgrounds and the concepts resulted in an identiy. (Erişti, Uluuysal, Dindar, 2013)

Halbwachs who was French sociologist proved that personal memory is an individual skill and depends on social conditions in 1920s (Öymen Özak, 2008). The perceived truth becomes meaningful with an image produced by the form of understanding of society. At that time, the image have started to exist as recollections, experience in social environment and this underpins of concept of perception. (Halbwachs, 1925)

According to Le Corbusier, architecture is considered by looking eyes, rotating heads and walking feet and therefore it is a structure which is not only phenomenon but also succession of pictures (Valbuena, 2013). As in Gestalt's visual perception theory, patterns have also significant effects on space perception. With the help of concepts like similarity, continuity, symmetry and distance, spaces also can be perceived disparately. As in example by Valbuena in figure 2.2 and 2.3, physical elements in a space can be highlighted in different ways and this causes space perception. In figure 2.2, there are differences in terms of spatial effect between the floor tiles where they are highlighted and not. Not only highlighted floor tiles, but also repetitive columns also created infinity effect in space. As in figure 2.3, a classic and ordinary floor pattern was repeated with a different pattern and in interior this situation turned exist floors

into a different design element. Therefore, it is understand that visual perception can be differentiate with different norms and their relation ship with each other.

Figure 2.2: Pattern perception in floor tiles (Valbuena, 2013).

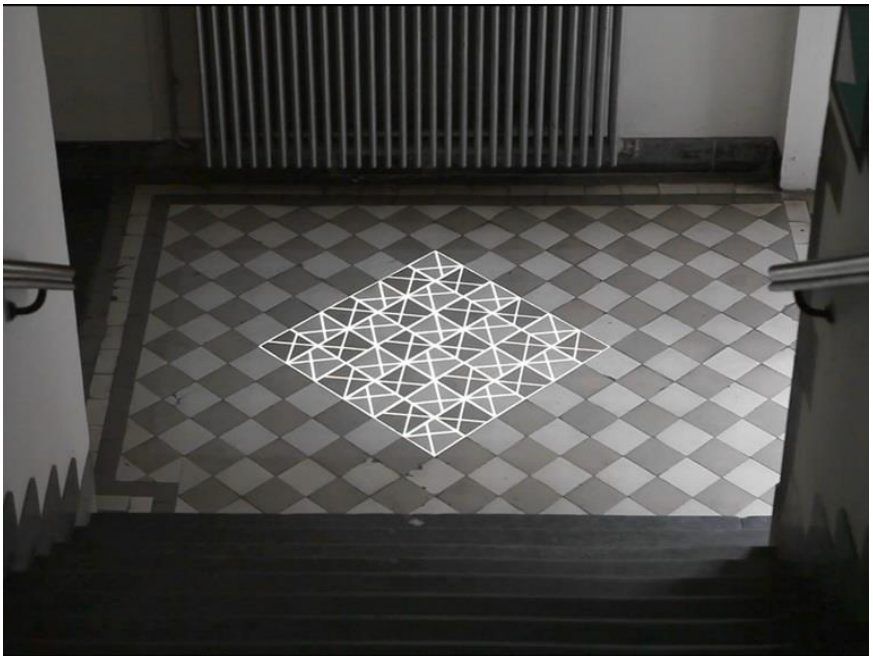


Figure 2.3: Example of underlining floor tiles (Valbuena, 2013).

According to Gibson (1979), perception is starting with the senses and transmit from outside to inside. Therefore space and its' features have most important effect on user perception. In conclusion, the relationship between spatial perception and cognition

have get involved in the process of perception by stimuli from environment and these are turned into action by matching differently in the brain.

2.2. Perception and Material

Usage of materials in design affects perception process because it is not only related with the physical requirements like aesthetic, production techniques and time, financial status, sustainability but also interact with past experiences, social identities, cultures (Zuo, 2010). Material helps the users to define the concept of the perception by description the space with physical words and senses. Aesthetic, appearance, meaning, experience, sensory experience are the concepts for material perception.

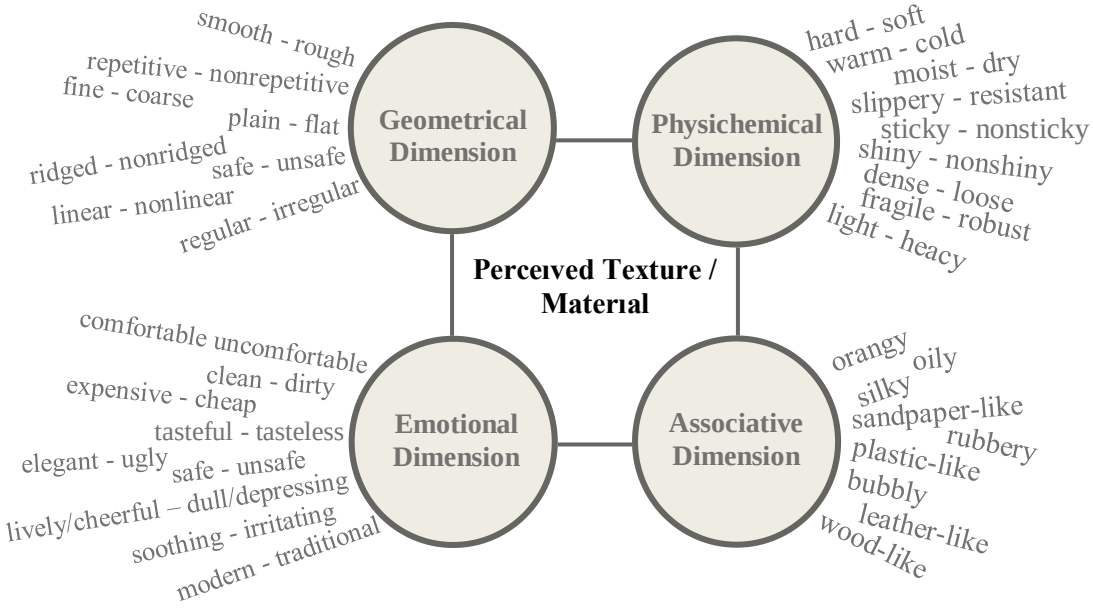


Figure 2.4: Zuo, H. (2010).

As it is seen in figure 2.4 from research by Zuo H., physical and psychological parameters can help to describe the space and this provides us to understand user perception. Physical parameters such as surface energy, smoothness, softness and brightness of the material affect the perception of people and differentiate their relationship with the space. Therefore according to this approach, it can be concluded that physical factors expose psychological states.

According to the study of material evaluation of 116 architecture students aged 17-25 by Wastiels, Schifferstein, Wouters and Heylighen (2013), differences in senses reveal material and perception relationship. Subjects experience brick, concrete, stone, gypsum, metal and wood materials (figure 2.5) in 3 different ways which are seing, touching and both together and results are evaluated within the scope of visual and cognitive perception. The effect of the material on user perception is proved out with the help of subjects answers. (Table 2.1)

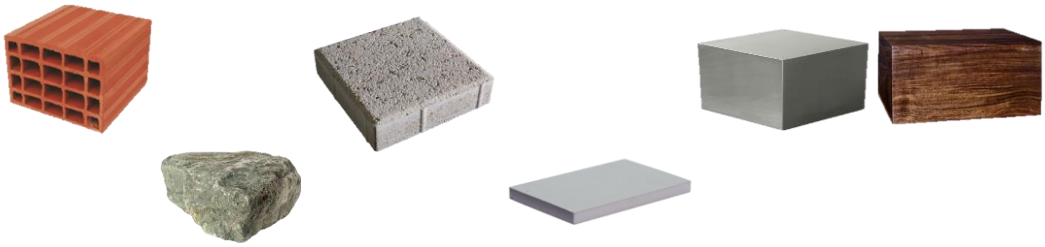


Figure 2.5: Material types in experimental study by Wastiels et al (2013).

Table 2.1: Wastiels et al (2013).

Materials	General evaluation (GEN)	Visual evaluation (VIS)	Tactile evaluation (TAC)
Material descriptions			
brickwork	brickwork(6), stone(2)	brickwork(4)	brickwork(16), concrete(4), stone(3)
blue stone	marble(4)	marble(5), (natural) stone(5)	glass(10), metal(3), plastic(3)
concrete	concrete(9)	concrete(7)	wood(11), (natural) stone(3), gypsum(2)
plasterwork		gypsum(2)	wood(11), (wall) paper(3)
steel	aluminum(3), metal(2)	metal(7), aluminum(4), steel(2)	metal(22), aluminum(3), steel(3)
wood	wood(3)	wood(4)	wood(19), fabric/textile(6)

Materials	General evaluation (GEN)	Visual evaluation (VIS)	Tactile evaluation (TAC)
Technical descriptions			
brickwork	strong(2)	good insulator(1), fire resistant(1)	grainy(2)
blue stone	expensive(4), heavy(3)	expensive(4), sturdy(3)	brittle(1), polished(1)
concrete	sturdy(4), bad insulation(1)	unfinished(3), strong(2), cheap(1)	heavy(4), fibres(2), thick(2)
plasterwork	unfinished(2), brittle(1)	light weight(2)	painted(3), cheap(2), bad insulation(1)
steel	flexible/bendable(4), sturdy(2)	bendable(1), thin(1)	painted(1), water repellent(1)
wood	unfinished(1)	light weight(4), unfinished(4), splinters(2)	fibrous(6), light weight(4), splinters(4), hairy(3), thin(2)
Sensory descriptions			
brickwork	rough(9), hard(3), warm(3)	warm(6), rough(3), red(2)	rough(10), hard(4), red(4), texture(4), massive(3)
blue stone	cold(8), dark(4), hard(3), smooth(2)	cold(5), dark(2), hard(2)	smooth(10), cold(9), glossy(7), massive(3), white(3), hard(2)
concrete	cold(7), hard(2), rough(2), soft(2)	cold(7), massive(3), rough(3), warm(3)	smooth(6), soft(5), hard(3), massive(2), rough(2), warm(2)
plasterwork	light(7), white(4), bright(3), cold(2), rough(2)	clear(3), white(3)	hard(7), white(4), warm(3), mat(2), rough(2), soft(2), uneven(2)
steel	cold(9), glossy(5), reflective(3), shiny(2)	cold(15), smooth(5),reflective(3)	cold(11), smooth(9), glossy(8), reflective(3), grey(2), hard(2)
wood	warm(11), soft(5), rough(3), pale(2)	warm(9), soft(1)	soft(9), rough (2), warm(2)

As is seen in table 2.1, users described the materials with different adjectives and when they perceive the material in different ways, their responses were changed accordingly. If we consider the material of concrete, the research claimed that when the subjects touched the concrete they mostly describe with positive words sensorially such as smooth, soft. They gave these positive answers because they thought it was wood. However, when they saw the material, they used negative words such as cold, hard. This results support the idea of material effect on perception. (Table 1) According to Berger (1989) sense of seeing includes more than eighty percent of the information received from the environment for space perception. It has also one of the most important roles in perception of space because spatial elements such as color, texture and forms underpin the bases of visual perception (Aydınlı, 1986).

The study by Wastiels et al. (2013) also proved that there are prejudices and stereoptypes about materials. For example, blue stone material evaluated with the positive words like smooth and glossy and supposed in TAC. However in GEN and VIS, the material described as cold, dark and hard. It has been also supported that for some materials, there is certain perception. For instance, wood and steel were evaluated in three ways of evaluation as same. Material descriptions and sensory descriptions were commented as same and this shows that their physical properties such as texture, temperature and appearance are perceived same. Therefore, it is concluded from this study that, if the material properties are perceived in a similar or same way by different senses, prejudices and stereotypes may be destroyed.

"In order to design buildings with a sensuous connection to life, one must think in a way that goes far beyond form and construction."-Peter Zumthor

"There are thousand different possibilities to one material alone" (Zumthor, 2006)

As we can understand from the above quotations, Peter Zumthor have given particular importance to material experience. Bruder Klaus Chapel can be one of the best examples for space experience. Zumthor gave priority to revive user memories with the physicality of materials in a space (Trias, 2015). Zumthor aimed to experience the sense of smell and therefore he had the wood form work to pour concrete but the different point is that these molds were not removed but burned. (Figure 2.4 and 2.5) Zumthor also chose pine consciously and considered each detail for users to experience space.

The untreated and refined elegancy of the interior was achieved by pouring it around pine logs that were then burned to expose the pieces of coal on the concrete. The concept behind it was to create a mystical but very rigid rectangular outer shape that masks an intimate interior that invites self-reflection.

The untreated and refined elegany of the interior was accomplished by pouring concrete around pine logs that were then burned to expose the pieces of coal on it. The purpose behind it was to create a mystical but very solid rectangular outer skin that masks a warm interior that invites self-reflection (Trias, 2015). Therefore, Zumthor's purpose was tried to create atmosphere and realized with the human experience. As in Bruder Klaus example, with the help of sense of smell, each people can be perceive the space different and recognize their own memories. People sometimes may like a place and spend their time in there however they can not explain why or how they liked there. They may just express themselves as feeling happy. Therefore, many cultural or personal reasons affect our perception and these become known with the help of senses so in that stage materials which are physical concepts play a crucial role. "Architecture is not an experience that words can translate later" (Perez-Gomez, 2006).

Figure 2.6: Exterior View of Bruder Klaus Chapel -Samuel Ludwig (Url-5).

Figure 2.7: Interier View of Bruder Klaus Chapel (Url-5).

Figure 2.8: Bruder Klaus Chapel (Url-5).

In conclusion of the relationship between material and perception, physical facts can manage the senses and therefore this situation provide visual and sensory experience in everyday life.

2.3. Perception of Children

Development of children perception can be divided into three stages: sensory development, perceptual development and cognitive development. Senses of smelling, tasting and most importantly seeing are completed from birth but they are not very sensitive at first. Therefore sensory development are completed with their functions (Lipsitt et al, 1963).

According to Piaget who was the first psychologist of theory of child cognitive development, children learn ideally while they are exploring the environment. While in 'discovery learning' process they spend most of time in school environment. Therefore their spaces where spend their time should provide flexible, child-centered, active, analysing spaces to their creativity. Furthermore, these places should enable them to construct their truths, to set and realize their tasks and to produce their solutions (McLeod, 2009). Cognitive psychology has also affected by maturity, experience, adaptation, organization and compensation and it can be explained with the help of biological principles (Kol, 2011)

Cognitive development is related with the process of knowing, identifying, understanding and learning (Piaget and Inhelder, 1956). According to Piaget, cognitive development process can be described into four stages. (Table 2.2) Sensorimotor period (between the ages of 0-2), preoperational period (between 2-7 ages), concrete operational period (between 7-11 ages) and intangible operational period (12 years and older) (Kol, 2011).

Table 2.2: Cognitive Development Periods according to Piaget (1956)

AGE / TERM	PERIOD	PRIMARY CHARACTERISTICS
0-2 AGES	SENSORIMOTOR PERIOD	• Development of sense and movement • To distinguish itself from the external World • Transition from reflexive behaviour to purposive behaviour • Knowledge of object continuity
2-7 AGES	PREOPERATIONAL PERIOD	• Thinking of egocentric • Expressing the experiences with symbols • One-way categorization • Decreasing egocentric thinking towards the end of period
7-11 AGES	CONCRETE OPERATIONAL PERIOD	• Concrete thinking • Development of logical thinking skills • Achievement of conservation • High level classification skills • Get away from egocentric thinking • Problem solving with concrete tacks
12 YEARS AND OLDER	INTANGIBLE OPERATIONAL PERIOD	• Abstract thinking • Adolescents ecocentrism • Problem solving with scientific tacks • To form of value and belief system • Close interest of the World of thought

Between the ages of 2-7, it is the period when the brain is most open to sensations and it has ability to organize them. Between the ages of 6-12, the image of environment is processing and children start to feel love the world (as cited in Öymen Özak, 2008).

In the period of concrete operations, they are gaining the knowledge about problem solving and they can understand the rules (Kol, 2011). Within this period, they are learning the skills from the environment, not the birth. They perceive the volume, weight,size and concrete features of the objects and gain thinking of logical which is called as'series' (serileme) according to Piaget (Babaoğlu, 2007)

In the period of intangible operations, when they are 12 years and older, they are able to make subjective comments and reasoning (uslamlama). In this period, abilities of

criticising, correcting, theorizing are developed and they have ‘combinational thinking’ (Babaoğlu, 2007). Emotional integration is developing with the physical environment and spaces take place in their memory (Öymen Özak,2008).

According to Gibson (1977), perceptual learning is a concept that each organism gets information from the environment and specified the things in the world.

2.4. Conclusion

As in Gestalt’s visual perception theory, whole is more meaningful than parts that constituent them. The theory is based on five principles that are; shape-ground relation, closeness, similarity, completion and continuity and simplicity (Senemoğlu, 2009).

Perception of space and material are in direct relationship with each other because personal backgrounds and experiences have affected the perception of space. Furthermore, spaces are also perceived with the material. According to researches, each elements that we perceive from the environment with the help of seeing, hearing touching, smelling and tasting, is ended by transforming the physical concept with ‘the perception’. As in philosophical dictionary, perception described as ‘transforming objective world with the help of senses into subjective consciousnesses and the design of the image in conscious from external world with senses’ (Hançerlioğlu, 1992)

According to Bauer (1997) adults are not remember their memories before age of three. Therefore, this shows that childhood period is more important than babyhood period in terms of spatial perception. Remembering and childhood memories have integrated with the memories where they live that moment. In childhood period, there is always ‘place’ facts in memories and these returns with ‘experiences’ that shapes the future. (Öymen Özak, 2008)

As Juhani Pallasmaa (2005) said “Every touching experience of architecture is multi-sensory”, people experience the space with many different factors. I understand from the examples and explanations previous researches, the material one of the most important factor in our perception because senses started our process of feelings. That process is ended up with the judgement and evaluations about the space. According to mood of people, backgrounds, culture, education and whole other effects, experience the structure is had a meaning.

According to a research (Wastiels et al,, 2013) that have been done based on material perception, it has been suggested that users have prejudices for some materials. They had some descriptions like unfinished, cold, rough when they see concrete material. However, when they touch it, they mostly describe as smooth, soft, wood. This experiment is one of the striking case study about material perception because all of the biases originated from users' past experience, previous feelings, cognitive and perceptual developments.

All kinds of development of children such as physical, psychological, intelligence, social and moral have been shaped and improved from their environment. Children have recorded their environment within the scope of basic need and sociodemographic factors have critical role on development of children in the adolescence.

This chapter has given the thesis a different method in terms of researching the possibilities that may occur with different material and its perception in interior. This section has also offered an insight to the study of perception in different scopes. In particular, literature views about children's perception and development processes has been a reference to the age group in children in terms of the objective investigation for concrete material perception.

3. CONCRETE IN TERMS OF MATERIALITY

“Very hard building material made by mixing together cement, sand, small stones and water” ("Concrete meaning in the Cambridge English Dictionary", 2019) defines concrete in dictionary. However it is more than that because concrete is one of the most commonly used building materials. In addition to being used as a bearing element, it also contributes to the design as an architectural element. (Beall, 2001) Since it was invented, concrete has been taking part in built environment not only as a construction material but also as a phenomenon.

Concrete is the second most consumed material after water (Essays, 2013). Considering the physical features and factors such as cost, process, durability, procurement, construction technique, workmanship, sustainability, concrete has great importance in terms of architecture.

In architecture, reinforced concrete has an autonomous role practically in all areas of building practice (Bake & Nolan, 2009). It is also an individually identifiable material within the structure in different forms. “Concrete had its own roles in this pattern of complex, chaotic political compromise and expedient bodging.” (Calder, 2015) Beyond being a material since the period before Christ that concrete directs architectural trends. It continues to exist in different forms by increasing its importance and with the help of developing technology

The technology of reinforced concrete material construction erected internationally during the late 19th century. In 1892, Hennebique French Company introduced a new slab systems for the market. This company was the most important one in the market beause, thanks to the slab system they introduced, first completely reinforced building was constructed (Grima López et al, 2013).

From the ancient times to present, concrete have made on of the most important contribution to the architecture with both physical advantages and technological developments.

3.1. Definiton of Concrete as a Physical Element

‘Concrete; sand, gravel, cement and water as materials with different properties is a building material produced by the mechanical and chemical interaction properties’ (Akçaer, Soyluk, 2015). Concrete consists a mixture. This mixture contains inert particles as graded size such as sand and gravel for mass of loose, and this creates the agent that held a solid form. Mass of loose may consist industiral wastes, wood chips, mineral fibers or different syntehetic materials. In addition to that the binding agent may be coal tar, cement, gypsum and other synthetic compounds (Ambrose & Tripeny, 2007).

Since this material was made from natural materials in ancient times, modern concrete was created by industry which was introduced in 19th century. In that time concrete had been used only for bridges, piers and heawy walls. However, at the end of the 19th century it was begun to use it for creating high rise buildings thanks to reinforced concrete (Ambrose & Tripeny, 2007).

For the load-bearing systems, factors such as cost, duration, strength, exterior conditions, workmanship, ecology, sustainability etc should be considered in detail. Reinforced concrete structures produce by on-site casting system which provide a continuous form. This form gives a different meaning and character to the structure. Due to fragmentary (jointed) structure of prefabricated systems, the cracks and hence deteriorations in the monolithic structure of on-site casting systems are occurred less frequently. (Karagüler, 2014)

Concrete also provided large spans and therefore this feature underlines its’ necessity for buildings.With the use of pebbles and powdered brick and making cement, concrete have started to use as structural material commonly. (Yamashita, 2012) As a material variations of mixtures provides different opportunities.

Brustalism and using exposed concrete in buildings is also respecting the material and its provide physical principle (Wal, 2017). Buildings are people’s habitat and while fulfil their needs with the physical requirements, it is important to

Figure 3.1: Ziva Baraga and Janez Lenassi, 1965, Ilirska Bistrica, Slovenia (Url-6).

Figure 3.2:Knit Candela from Zaha Hadid Architects (Url-7).

As above examples from Lenassi, Baraga and Zaha Hadid, with the help of concrete feasibility, preferred shapes can be constructed. Providing more possibilities to the

realization of design, concrete's one of the most essential characteristic for the structures.

Figure 3.3: Acropolis Museum - Greece (Philips, Yamashita 2012).

In Acropolis Museum by Bernard Tschumi Architects, extremely big cantilever shade in the entrance was made of concrete. With the repeated concrete columns and large holes, classical order and Parthenon were tried to recall. (Philips, Yamashita, 2012)

3.2. Concrete in Design History

Starting from the ancient Egyptians that used clay mortar in the construction of pyramids and the Pantheon with 43 meter open dome in BC 27, the use of concrete in architecture have been crucial importance. (Essays, 2013 and Topçu,2014). The word of 'mortar' was first used in 1920 and 'cement' was used in 1710 in Oxford dictionary and within line these developments concrete and reinforced concrete had taken part in the literature.

Figure 3.4: The dome of the Pantheon (Tan, 2015).

First high-rise building was Ingalls Building which is 16 storey and 64 metres in Ohio in 1902. According to Calder (2015), economic and practical factors made concrete fundamental elements for medium and large sized buildings after 1950.

In Turkey, first reinforced concrete application was Saint Antuan Church which is also first concrete church in the world in 1906 (Topçu, 2014). First collective housing and first multi-storey buildings in Turkey were Tayyare Apartments (also called as Harikzedegan Evleri) which is Crown Plaza Otel in Laleli now. (Topçu, 2014)

Figure 3.5: Saint Antuan Church (Yeteroğlu,2015).

Figure 3.6: Tayyare Apartments (Harikzedegan Evleri) (İnan 2006).

'In 1922, the tallest concrete building was built-70,10 meters., the Medical Arts building, Dallas' (Unassignment.com, 2018). As we can understand that forms of utilization for concrete had been increased with the contribution of technological developments.

In the history, concrete has also been important for defense because of its physical endurance. In the Second World War, the blockhouses / concrete bunkers (korugan) had been need to arise to defense against the developed war and attack technologies under that period's conditions. These structures were constructed at strategic locations in order to see the maximum area with minimum visibility and these structures had also thick walls and less gaps. (Ocak, Tekin, 2019)

Figure 3.7: Bunker near Durres - Albenia (Payne,2014).

Concrete has helped this type of structure -unlike previous defence structure – without joint, fragmentation and deterioriation as a whole and this has provided opportunity for better protection.

"The bunker was built in relationship to this new climate; its restrained volume, its rounded or flattened angles, the thickness of its walls, the embrasure systems, the various types of concealment for its rare openings; its armor plating, iron doors, and air filters-all this depicts another military space, a new climactic reality." (Virilio,1975).

Figure 3.8: Narrow shaft entrance (mirror, Eastnews Press Agency) (Url-4).

The communist ideology was reflected in the physical environment, which was changed in a harsh way during this period. New towns were built as well as many huge industries, city centres of existing cities were re-constructed, statues and monuments were raised and street names were changed.

Historical buildings that did not suit the dictatorship were torn down. Religious buildings were demolished or turned into profane buildings since Albania in theory was an atheistic state. Collective memories and traditions were erased and new collective memories were shaped. (Myhrberg, 2011, pp. 11)

Figure 3.9: Small bunker in the main boulevard in Tirana (Myhrberg, 2011).

Figure 3.10: Example of a bunker in the city center of Tirana (Url-2).

Figure 3.11: Example of transformation of bunkers into city life (Url-1).

Figure 3.12: Interior of a bunker from Cold War (Eatnews Press Agency) (Url-4).

As explained above, concrete took an active role with the help of its' physical opportunities and has been influential in human life at many different points in the world.

3.3. Concrete as an Interior Design Element

'Design element cannot be used independently' (Al-Zamil, 2017). Cheap, utilitarian rural buildings was the beginning of concrete usage as a modern discourse. After the World War I, modernist architects utilized from concrete the deconstruction of new cities. Le Corbusier was the one of them. Corbusier fascinated using concerete as an architectural elements both in exteriors and interiors. Le Corbusier used the ability of concrete to create various molding forms, open floor plans, wide windows and free

façades. These characterist can be seen in the Villa Savoye. Tactual expressiveness of concrete took Le Corbusier's attention, which could provide primitive purity and wider scale building typology (Calder, 2016). That is why Corbusier used concrete as a poetic engineer, it can be seen at monastery of La Tourette and Chapel Ronchamp. It was the time that actually Le Corbuser processed the 'beton brut' (bare concrete), and then brutalism and new brutalism movement occurred. Texture and surface treatment of concrete took a big role in buildings both in interiors and exteriors. Architects like Le Corbusier, Reyner Banham, Peter and Alison Smitson used bare concrete with its own texture and colors (Quddus, 2014)

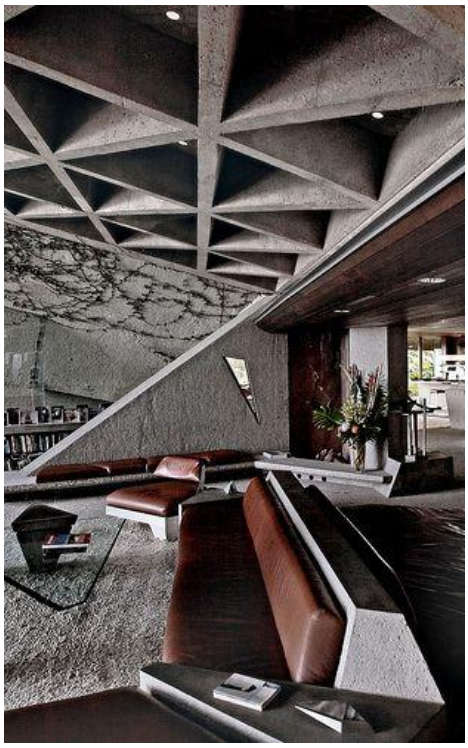


Figure 3.13: 1963 Sheats House – John Lautner (Url-10).

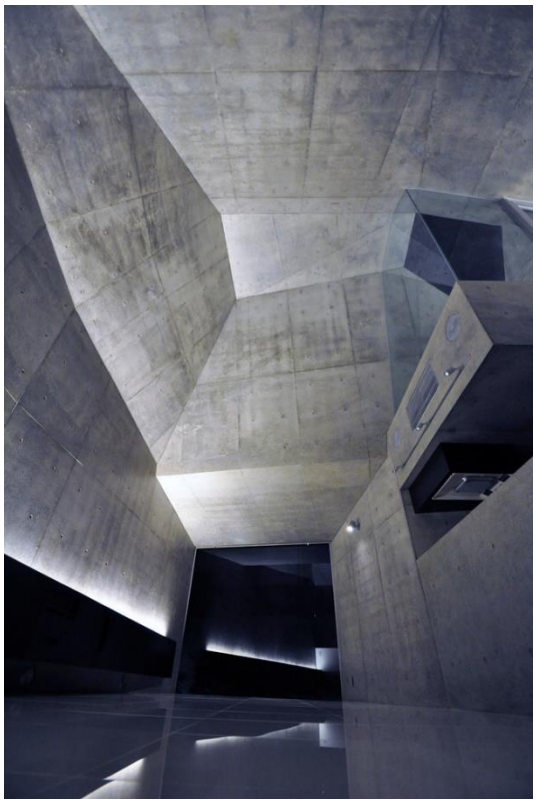


Figure 3.14: House in Abiko (Url-12).

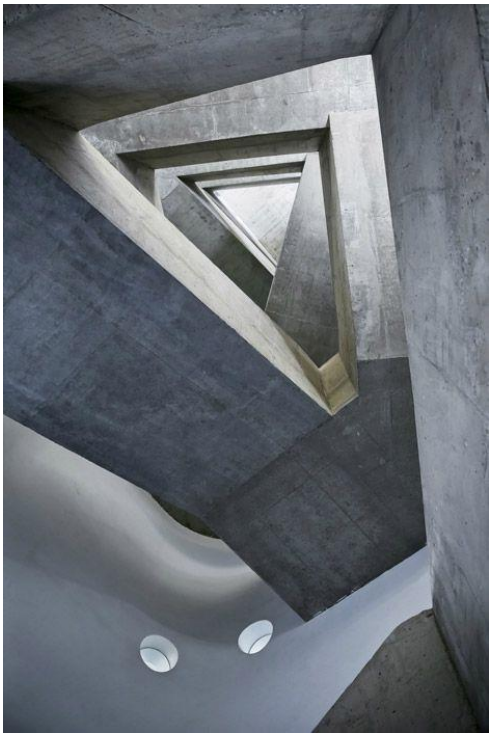


Figure 3.15 Photograph by Su Shengliang (Url-11).

As seen in above examples Figure 3.12, 3.13 and 3.14, a place to be observed as a work of art that people will experience while bulding the structure is also being created

with the help of concrete. In addition to being used as a visual element with forming and bearing the structure, it is used in interior architecture as a functional element in different forms as below examples figure 3.15, 3.16 and 3.17.

Figure 3.16: Interior Design By Jan Verlinde (Url-13).

As in above example, in a small space, not only the ceiling opening and daylight are provided but also restroom need are satisfied with the concrete circle in the middle. With this concrete wall in the middle of the space, not only function is met, but also a visual interior design element has been formed.

Figure 3.17: Westrand. Dilbeek, Belgium. (1973) (Url-14).

As in above figure 3.16, concrete is seen as both a structural elemetns and also a seating unit.

Figure 3.18: H3 House / Luciano Kruk (Url-15).

As given in example of interor spaces (Figure 3.18), concrete used as structural, circulation and built in furniture element. Functions are met with the unity of appearance.

With the appropriate applications, concrete can be shaped according to interior requirements and while it fulfill the architectural needs, the material can be shown itself and attract people attention as a sculpture.

3.4. Conclusion

'Architectural ideas are born in mind and architecture is the physical product of creativity.' (Schmitt, 1999) As explained above, concrete has been structural element that shapes arcitectura and movements as well as being an one of the most important constructional material. With the technological developments, in addition to the all features that the exposed conrete contributed to the structure, it has also visual responsibility.

In the first use of concrete, although it has been produced as nonstructural elements such as pots, the usage of concrete has been mainly started with the production of reinforced concrete as structural element in building (Karagüler, 2014).

'Exposed concrete was the material of many of London's most high-profile housing schemes, schools, leisure centres and hospitals, tying the National Theatre in with the national and local Welfare State. The association between concrete and these publicly provided facilities for all echoes Hayward's preoccupation with universal access to the arts" (Calder, 2015)

When the exposed concrete is reinforced with iron, it has started to play a significant role in the historical process as a building element. The increasing of usage concrete as a visual element had changed the architectural and interior architectural point of views.

This chapter has also led to field studies in terms of literature review because the history of the concrete and its transformation over the years cause new discussions. Changes in design for concrete has became a phenomenon and therefore supporting the idea of material perception through experimental studies can lead to different perspectives with concrete results.

4. LEARNING ENVIRONMENTS

From birth to adult, period which means while in physical, perceptual-cognitive and social-emotional process, school environment has vital importance in children's psychology and their relationship with their surroundings. The development of the senses such as seeing, hearing, taste, smell and touch have continued to develop along with learning in the school environment. Children who are in contact with the environment in every moment they create a world of one's own by using every information they receive from surroundings. While they are spending the most important phase for their psychological process in schools all of these situations increase the precision of educational structure in social point of view. Therefore, educational buildings have importance on society and shape the future. As finding, child behaviours are determined by the psycho-social environment and space rather than their personal characteristics such as personality and intelligence. (Gür, 2002) In the process of being an adult and personality formation, the adaptation of the children to society have been progressed around the school.

4.1. General Parameters of Learning Environment

When designer design a school, they have to consider children's psychology and their basic needs to proper environment. Educational building designs have been reflection of society values and ideas. For example, for schools, number of floors, type and size of classrooms, open and closed spaces and common areas are some of spaces which represent value of society. There are some debates about this issue, one of them claim that, one storey school buildings has better conditions for hygiene and pedagogical reasons like natural lighting, ventilation and relationship between interior and exterior spaces for primary schools. (Gür, 2002) However, at the present time multi-storey school designs have been increasing.

Within the scope of perception and Gestalt theory, some concepts such as distance, proximity, order, separation and continuity in the places should be considered in the context of topological relations in architecture.

Social activities and common spaces are places that should be given high importance in school designs. Because of that these spaces do not only provide socializing, communicating, resting, having fun but also fulfill their needs and prove their existence

It is possible to say that, ideal school design requirements can be sorted as follows; well designed and controlled entrance, large lounges, clockrooms and lockers, proper size toilets also for disable people, meeting rooms both parents and teachers, rooms for directors, teachers and personnel, kitchen, canteen, medical aid, ateiler, laboratory, multi-functional spaces for workshop and school clubs, eating places and different kind of spaces for storage, archieve and sports-activity (Gür, 2002).

In addition to these general parameters, in the beginning of 20th century, 'open school' concept has been occurred. The basic idea of open schools was come out from the idea of protection against the tuberculosis which the sickness was widespread during the Second World War. In 1930s, classrooms were tried to transform into outdoor terraces and the idea of mobility was adopted with lightweight furnitures. (Url-8, 2016) The following idea of these, four walls and closed plan classrooms were replaced by open-plan structures as 21st century notably in Norway, Swedeni Australia, New Zealand (Mealing et al, 2015). Because of noise, illnesses, restriction of activities, etc open schools had gain popularity. "To large scale ambitious plans to rebuilt and remodeled schools to create learning environments which inspire all young people to unlock hidden talents and reach their full potential; provide teachers with 21st century work places; and provide access to facilities which can be used by all members of the local community" (European Union, 2017)

Figure 4.1: Open-air school, Norway, 1920 (Proeuropeana, 2015) (Url-16).

With the view of these information, schools have many kinds of parameter in terms of design and each of these have key importance for children and their future for society. Each requirement should be provided according to culture, physical features, period for child's psychology who are in the most critical term of the development to better future.

4.1.1. Physical comfort in learning environment

In this part, in order to support the classroom design in experimental study, architectural elements, ergonomy and material standards according to ESMDSG have been analysed.

4.1.1.1. Architectural elements and ergonomy in learning environment

According to Sanoff (2001), typical classroom is consist of desks in rows and columns to organize and control students.

According to Educational Structures Minimum Design Standards Guidelines (Eğitim Yapilari Asgari Tasarim Standartlari Kilavuzu) (2015), one of the significant point is that including the students in design process because social opportunities, working spaces, comfort, sustainable, flexible in a word active spaces should be provided for them. Sun, wind, humidity and rainfall should be considered for physical structures in general and these factors should be applied to the building accordint to environmental and topography conditions. Each element, product, material and structural forms, that

are in architectural and design concepts, should be provided for psychological, cognitive and menal development of children. According to ESMDSG (2015), some of basic standards except independent playschools can be listed as below,

- Floor height should be 4.50m. in basement and 4.00m in ground and typical floors
- Entrance halls must be wide and brighten
- Layout plan with courtyards instead of narrow and long corridors
- Closed break-time spaces in cold climate regions in order to gather
- Anti-flaming materials must be used in walls, slabs, ceilings, columns, beams
- Walls interior coatings, heat and sound insulation must be choosen hard flame material
- Main entrance-exit doors must be designed according to number of use and secondary emergency escape door must be considered
- Classrooms must be planned according to the capacity of 30 students
- In case of need, storage area, opening directly to the classroom, must be considered
- In the classrooms, except the storage area, the gross area per capita is min 1.6m² in primary schools, 1,85m² in secondary and high schools.
- The total area of the circulation areas must be between 50% and %60 of total area of educational, social and administrative areas
- Corridors must be design as social and living space with the use of seating and structural units.
- Corridor ends must not be closed with the spaces or fire escape and should be brighten
- Corridor width for single sided classrooms mustbe min 2.50 m, for double-sided classrooms must be min 3.00m
- There must not be rise between floors

4.1.1.2. Material in learning environment

The classroom or the school itself is much more than a simple container in which learning and educational experiences happen, as if indifferent to the spatial and material environment. (Moss and Pini, 2016)

According to ESMDSG (2015), some of basic standards about material and color can be listed as below,

- All floor coatings must be hard, stable, impact resistance, low maintenance and non slip
- Doors, windows and different floor heights must be highlighted with vivid and warm colors
- Special color must be used on most single walls of each interior spaces and must be avoided gender discrimination with the use of colors like pink-blue
- All ceiling and wall paints must be water-based and must not contain chemicals that are harmful for human healt-
- Metal cabinets must be painted with polyester or epoxy polyester powder coated painted with the electrostatic painted practice.
- In the facades, dark and bright colors must not be used and pastel colors must be choosen
- In exterior facades, colors such as blue, navy blue, claret red, red, dark green must not be used.
- In facades without windows may be used little darker colors and consist of two colors.
- In facades with windows brighter colors may be better to use.
- Up to 1.50. interior spaces, oil painting applications should be in pastel colors like solmon pink, champagne, lilac etc. For surfaces above 1.50m, specified colors' tint should be used

4.2. Learning Environment and Interior Features in Turkey

Before Republic period in Turkey educational structures design is like Asian style which has classrooms that are located in around open or closed yard, symmetrical, rectangular or square plan layout. (Figure 4.2 and 4.3) They generally refer ground, sky and water concept with their magnificent and monumental appearance. In Tanzimat period while in the mainstream of modernism, architecture has been also evolved to modern design understanding. Haydarpasa, Kabatas, Camlica and Galatasaray High School are some of example of this rationalization. (Gür, 2002)

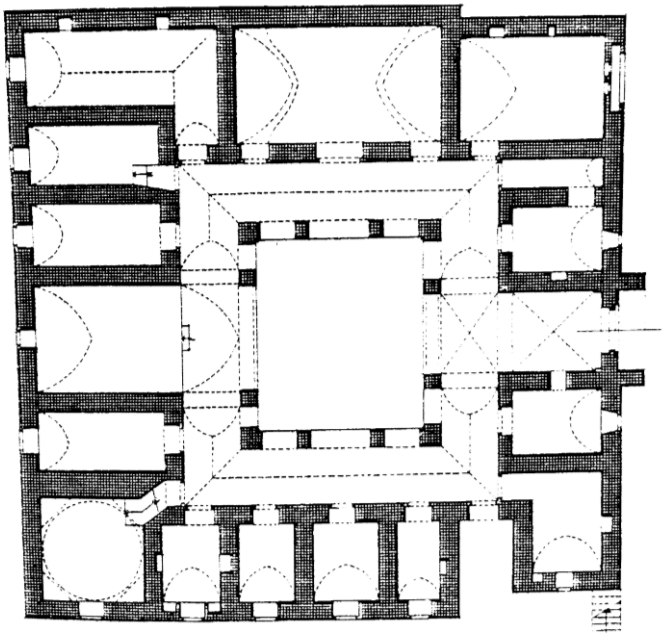


Figure 4.2: Gür (2002), Zinciriye Medresesi, Diyarbakır.

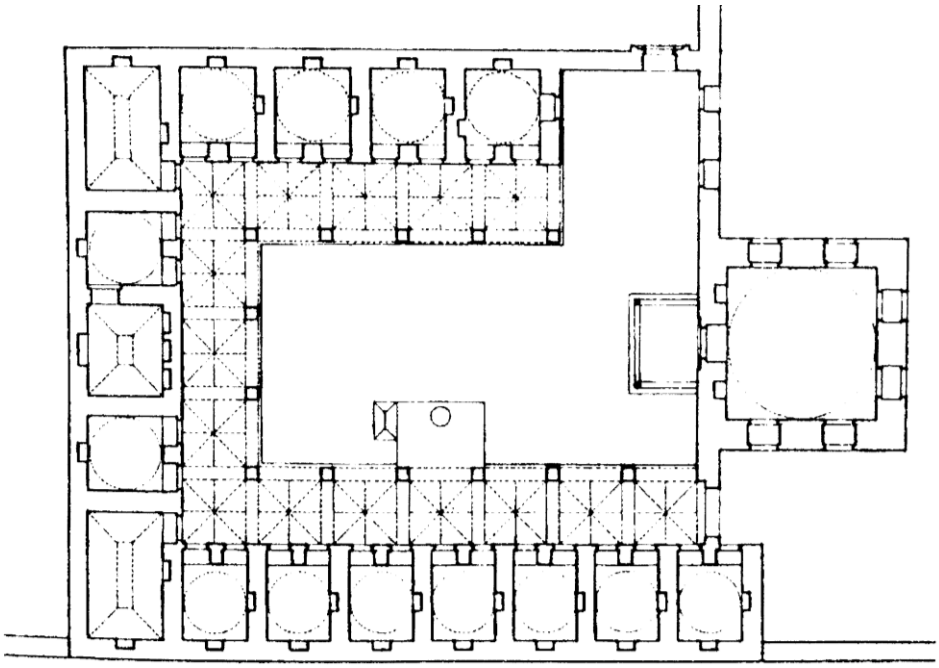


Figure 4.3: Gür (2002), Soğukkuyu Medresesi, Ayasofya.

While there have been revolutions in all areas of life, education the general structure of education system had undoubtedly changed and this is the most important factor for society and future of the country.

In the past years educational structures have been contructing in accordance with the rules set by the government to minimize the mistakes and this practice called ‘Type

Project' (Tip Proje). It means one type of school for all cities. (Figure 4.4 and 4.5) However this strategy is not appropriate in physical, psychological and aesthetical aspects for students. Geographical conditions such as climate, raw materials, accesibility are not considered in this type of practice. Therefore this situation causes educational and functional problems. Scale of these structures is not fit every district so for some areas it would be too small or too big and also those cause to undefined and unprincipled cities. Material, shape and size of buildings should be in harmony with the environment. Texture of school should be supported by landscape but in Turkey there is not many example of this situation. Type Project structures are generally high ceiling, straight, dry and achromatic buildings. This situation also has a negative impact on students' individuality and creativity. However, as explained before school designs should improve sense of trust and defection for child psychology.

With this approach, society's future and thoughts are being standardized. (Ciravoğlu, 2004)

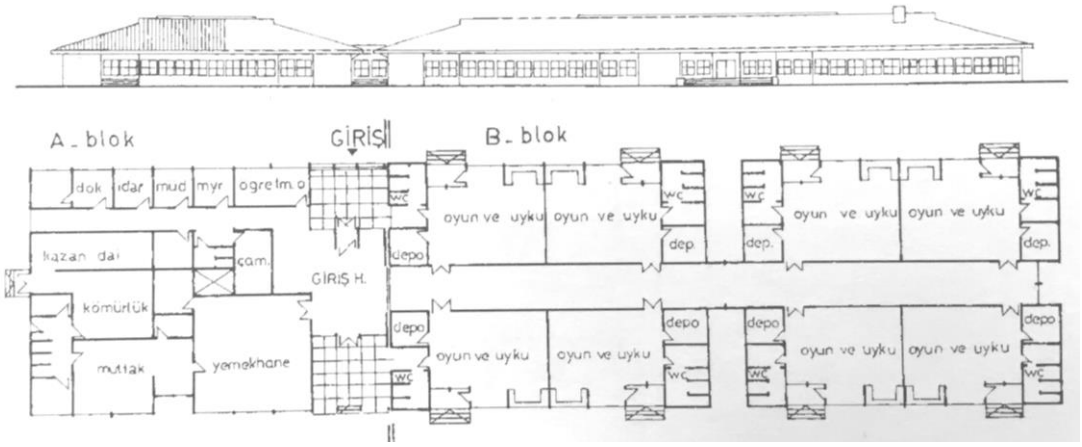


Figure 4.4: Gür (2002), Preschool structure up to 150 student capacity- plan and elevation – Type Project.

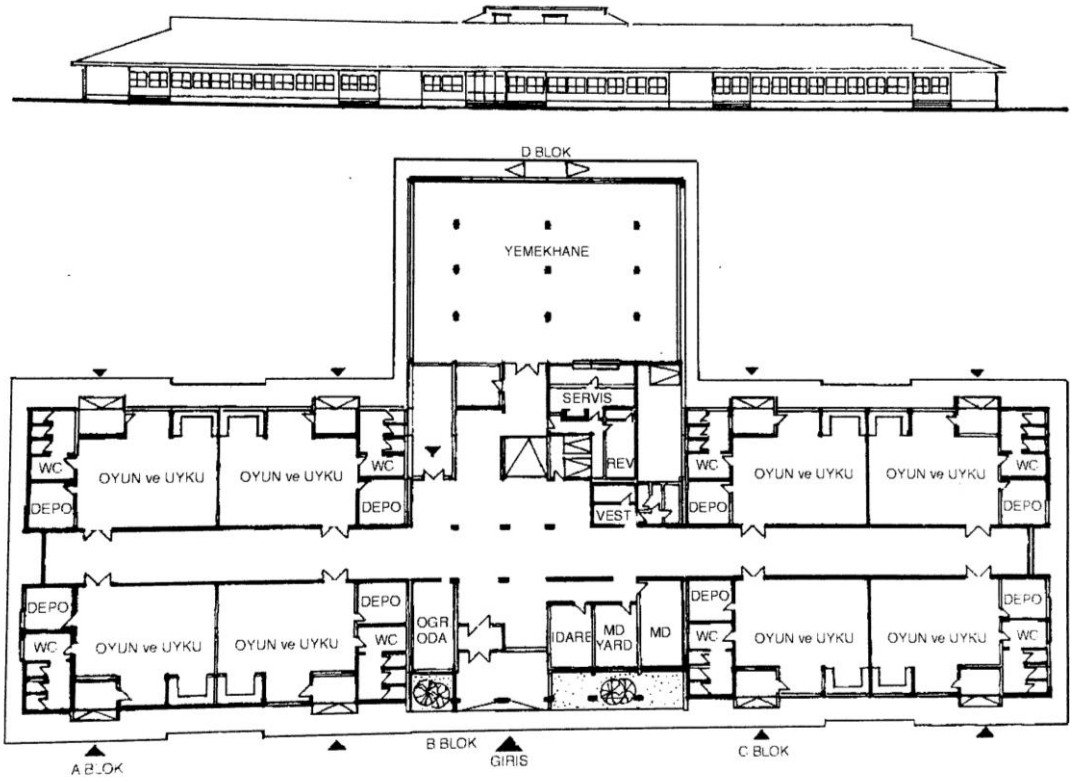


Figure 4.5: Gür (2002), Preschool structure up to 200 student capacity- plan and elevation – Type Project.

Today, many schools which provide architecture education have given importance to design of structure and they try to make difference. When architects design school spaces they also take into consideration for school environment as a whole. For example, according to some primary schools' conference room were used as a society center and gymnasium used by that region. Besides, people who live in there use some classrooms in summer times as atelier. It is possible to say that in Turkey, educational structures have multi-functional mission because of lack of activity building in some local areas. (Gür,2002)

When climate condition is not suitable for exterior student activity, there should some interior flexible spaces for students' leisure time. Moreover, outdoor spaces should have flexible design for different type of activity and also, green areas, mud and material of surfaces should be consider in the scope of architectural design. Creative and independent environments which enable psychological development of children should be built.

Figure 4.6: Example of modern educational structure.

Architects and designers should evaluate schools based on children needs, functionality like plan type and circulation, social relation, self development and security. School design should be accordingly age structure. Some age range is in growing period so before design process there should be correct. Survey which include three different primary schools such as Mimar Sinan İlkokulu, Cudibey İlkokulu, Yavuz Selim Ilkokulu shows that more than one storey structures are not perceived by primary schools students until 10-11 age range. (Gür,2002) This research claim that two different points. One of them is that the structure complexity which is more than one storey building affect visual reality. Second one is that increasement in the number of storey cause to difficulty in perception for primary students. Furthermore, researchers find that girls are more careful in spatial space details than boys. In addition to this this research supports that one storey structures has less risk than multi

storey structures. According to Cansever (2014), he has also advised that single storey, on the same level educational buildings and he defend that these structures are not eye-strained, practical and air-flowed (2014)

If schools designs are carrying out by taking into consideration of child psychology and pediatric development sensitively within the scope of social factors there is no doubt that their interests and interactions with their environments and their enthusiasm will be improved.

4.3. Conclusion

School environment are within direct relations with the urban life, built environment, and architectural applications. While designing educational structures, not only physical features like materials, durability, strength, health, ergonomy, proper shelter etc but also their cognitive development and psychology should be taken into consideration. Generations who will shape the future have taken the first places within the first social organization around the schools. (Ciravoğlu, 2004) In the process of socialization, children have played a part in each stage. Therefore, with the change of every physical elements in school environments, children perception, development, interaction with the social surroundings were affected.

With the developing world, technology and understanding of architecture, different point of view are coming out. However, schools should increase the capacity of thinking, judging, selecting and reasoning with the proper physical opportunities. (Gür, 2004)

In my opinion, there were ongoing standards, rules, restrictions and regulations which were composed by previous experiences, problems and solutions.However, with the help of development of each area that affects people's everyday life, psychology, physical, and cognition should be in considered for educational structures. The spaces in which cognitive and perceptual development is shaped in the most important period should be thought in small details and must be created an environment that not only reflects the bust but also chase the future.

'If we teach today's students as we taught yesterday's, we rob them of tomorrow' – John Dewey

5. FIELD STUDY

In this chapter, field study have been done into two steps with visual research methods to understand and discuss perception concrete material in interior spaces.

5.1. Method

Methodology and hypothesis are defined in the light of descriptive explanations. The research questions of the thesis are;

Is the perception of the use of concrete in contemporary/phenomenon architecture different in preference concept for user who have design education and not ?

Is the perception of material in interior spaces related with the cognitive process?

Hypotheses are as follows:

Users who have design educated evaluate the space, which is designed with concrete dominantly, positively.

Users who do not have design education evaluate the concrete space negatively.

Children who are in the beginning of cognitive development prefer textured concrete classroom rather than ordinary / common classrooms.

The field study research was based on two steps which are supported each other. Preliminary study is carried out with the participants which are in same perception process (between 18-26 years old) by showing photos of the concrete based school. Experimental study is implemented with VR glasses on primary school children in order to investigate material preference without perceptual experience. To prove this idea, different designed 2 classroom which are ordinary and concrete dominantly were showed to primary school children.

Table 5.1: Preliminary study and experimental study datas.

PRELIMINARY STUDY	EXPERIMENTAL STUDY WITH VR
80 participants	33 participants
18-26 years old	6-7 years old
Have design education and not have design education	Primary school student
Showing photos of concrete dominant school from İSMEP Project – Güngören Tozkoparan Ortaokulu	Ordinary Classroom Design and Concrete Dominant Classroom Design were showed by VR glass
To compare material perception and its relation with design education	To investigate the relation between material perception and prejudices.

5.1.1. Preliminary study

In order to support the thesis research; a pilot study was formed to obtain from the users on the relationship between material and perception. In terms of perception development, the questionnaire was formed by selecting the same age group (between 18-26), considering the perspectives of design for the future and considering the individuals who have received and not received design education. The aim of this study is to evaluate the contemporary architecture concept on 2 different groups with and without a design education. Subject group; 40 university students or graduates with design education (DEP) or 40 people who don't have design education or graduate students (NDEP). In the survey; about school space; While associating with the use of color, the photograph was selected in which there are no clues (classrooms, rows, wood, etc.) about the educational structures and the material is seen intensively. Photo was from Güngören Tozkoparan Ortaokulu which is one of the schools as part of the project.

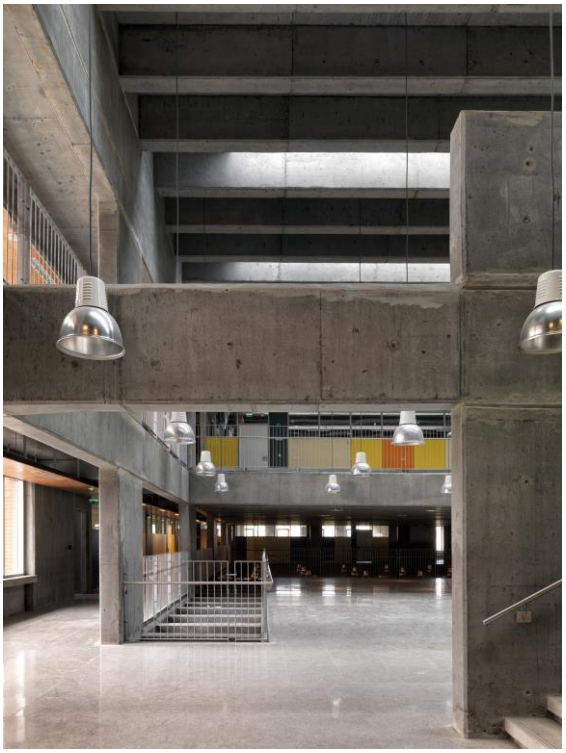


Figure 5.1: Photo that used in survey - Güngören Tozkoparan Ortaokulu (Url 9).

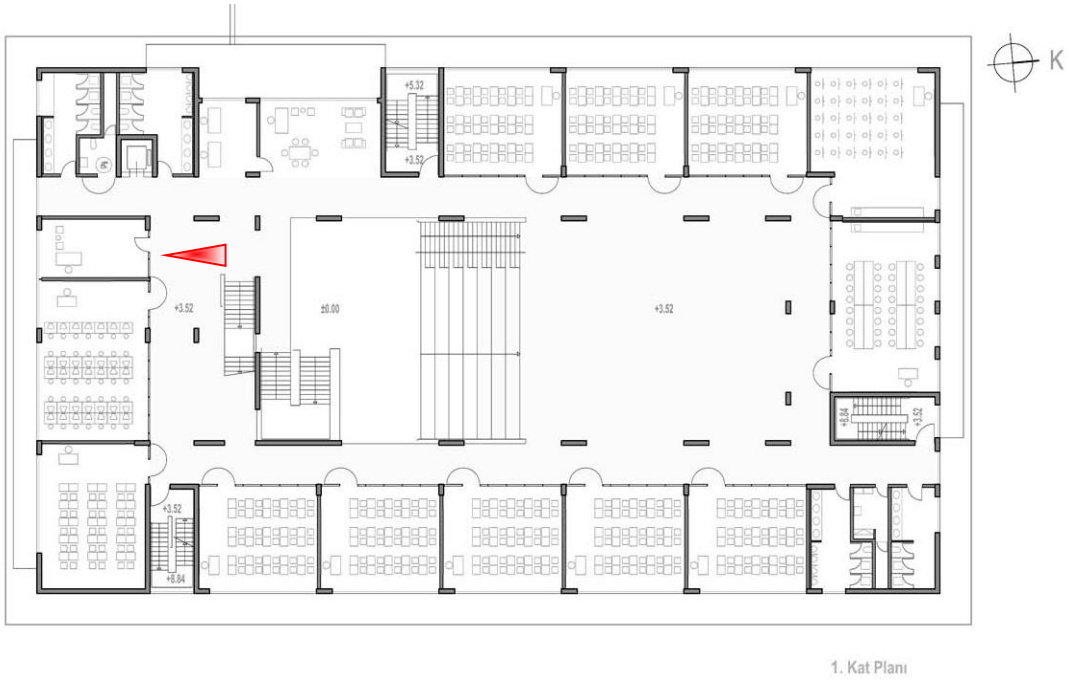


Figure 5.2: First floor plan and point of view of selected photo(red triangle) that used in survey (Url 9).

Questions were prepared with the help of open-ended questions, with the aim of evaluating the perceptions of the subjects with the help of open-ended questions,

without first referring to them and with primary responses. It was aimed to obtain individual information about the perception by the participants with positive-negative responses of adjective couples and I liked / didn't like. Answers; physical fiction, material, cognitive factors and architectural fiction.

5.1.1.1. Study area

According to explanation of Semra Uygur (2015), who is a co-founder of Uygur Mimarlık, this project has evolved from the idea of destroying the prejudices that formal government structures are not good and convenient. They have been trying to create 'Mahalle Mektebi' –local schools that is the idea of intimate and tighter relationship with each other and the space for students. İSMEP is a project which consist of 44 schools to provide safe environment and increase the capacity and the schools are located in seismic zones. For each project, there have to be some requirements like quick construction because of students are guest in another school so they design construction elements as on-site application. Educational buildings also have to be rigid and durable because these spaces are not hygenic. Therefore, as Uygur said that they prefer to use fair-faced concrete as blocks because the material provide not only the physical properties like non-combustible, unstratchable, easy to find but also because of the appearance the material is self-effacing and encourage to create or hang on it for students.

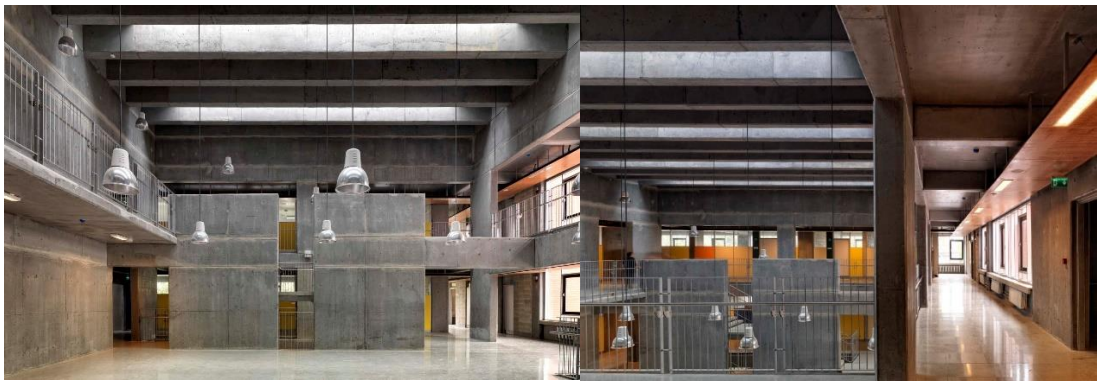


Figure 5.3: Güngören Tozkoparan Ortaokulu, one of the school within the scope of İSMEP (Url 9).

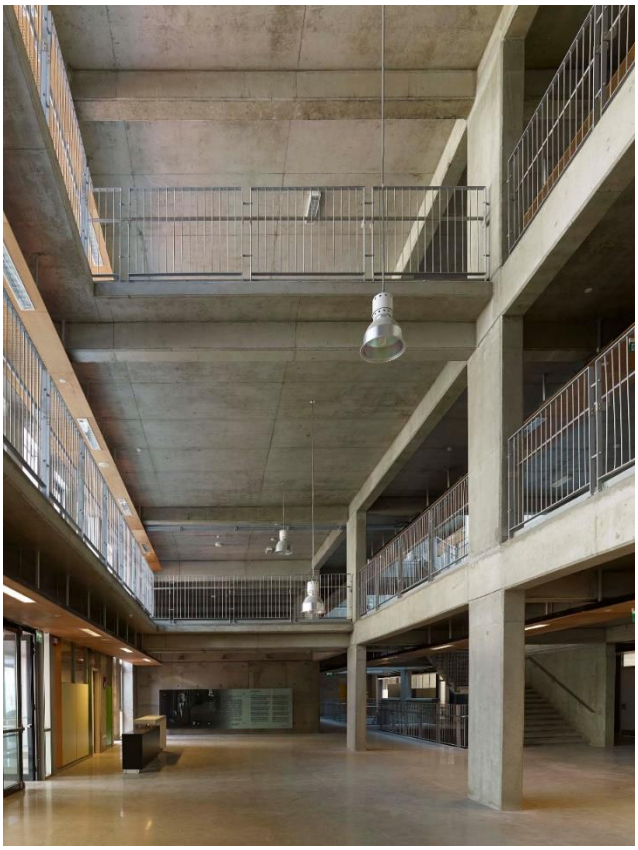


Figure 5.4: Beşiktaş Yenilevent Lisesi, one of the school within the scope of İSMEP (Url 9).

5.1.1.2. Analyses

1. The question *'What structure do you think you see in the photo?'* In the experimental group, the majority (> 50%) described the structure that they had seen in the photograph as the educational structure (Figure 5.5 and 5.6). DEP participants who

received design education compared the education structure with a relatively higher rate. (While 67% of those receiving design, education are considered as educational structures, this rate is 59% for those who don't have design education.) (Figure 5.5)

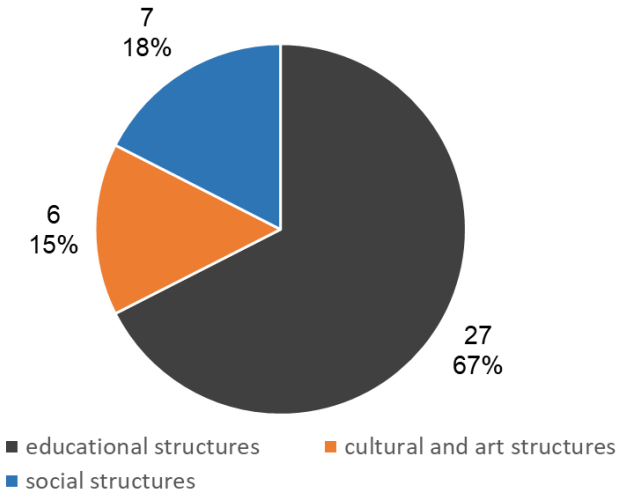


Figure 5.5: Structure type classification of design educated participants.

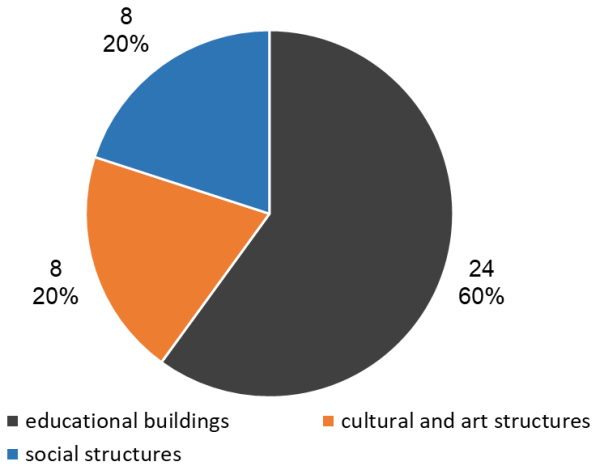


Figure 5.6: Structure type classification of non-design educated participants.

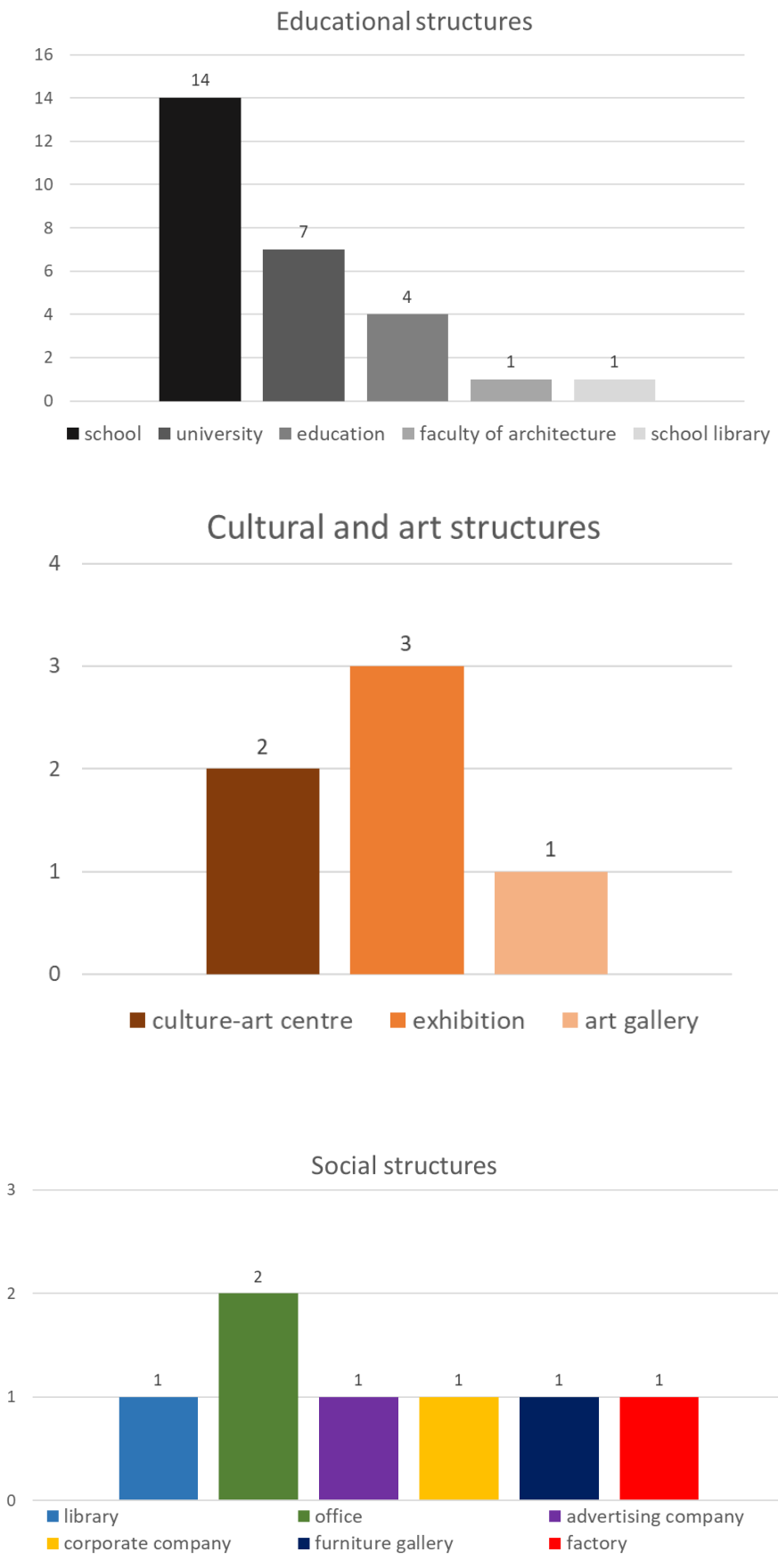


Figure 5.7: Categories of responses from design educated participants.

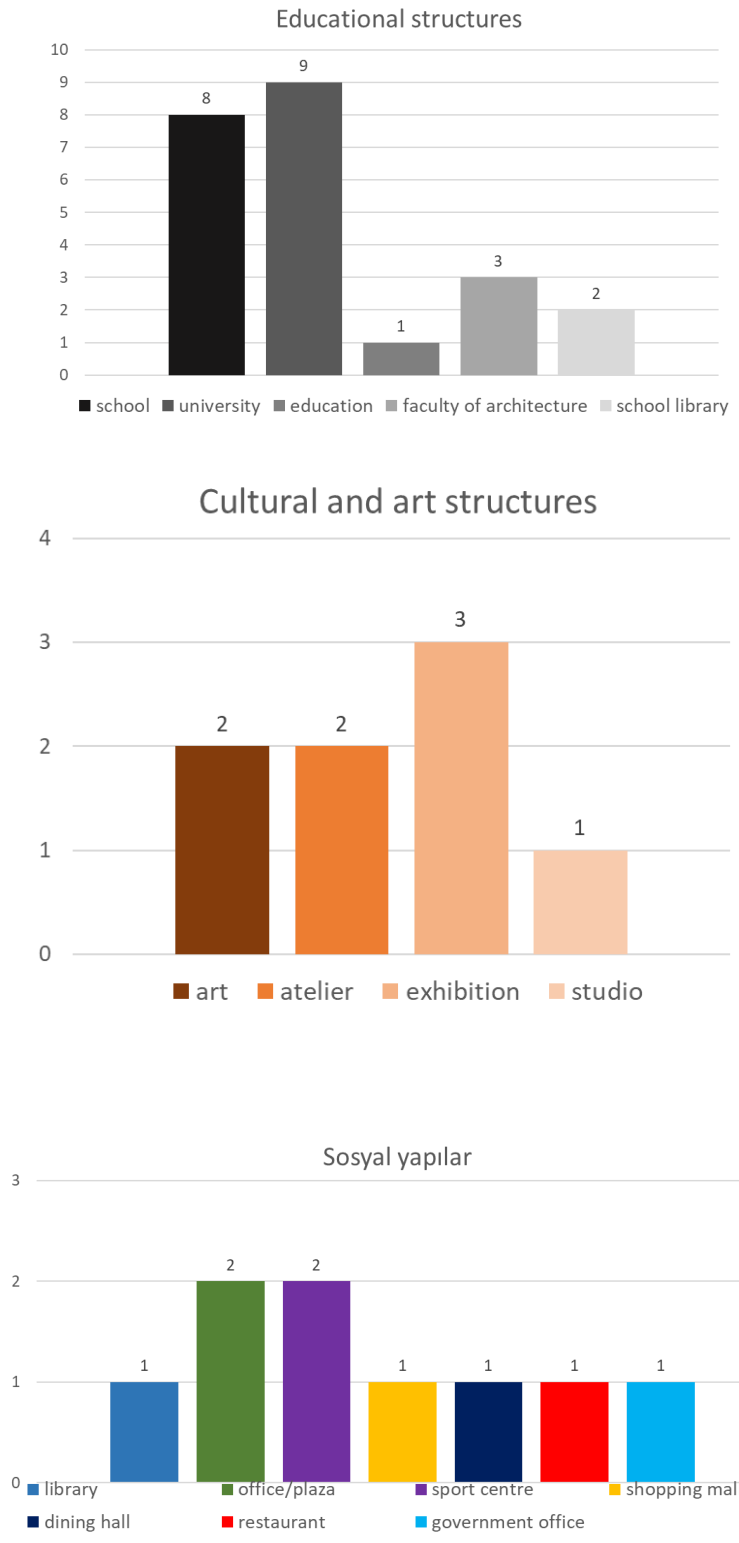


Figure 5.8: Categories of responses from non-design educated participants.

The reason of the question 1 was asked in question 2 and the answers in the category education structures were categorized as physical fiction, architectural elements, material, lighting, cognitive factors. (Figure 5.9)

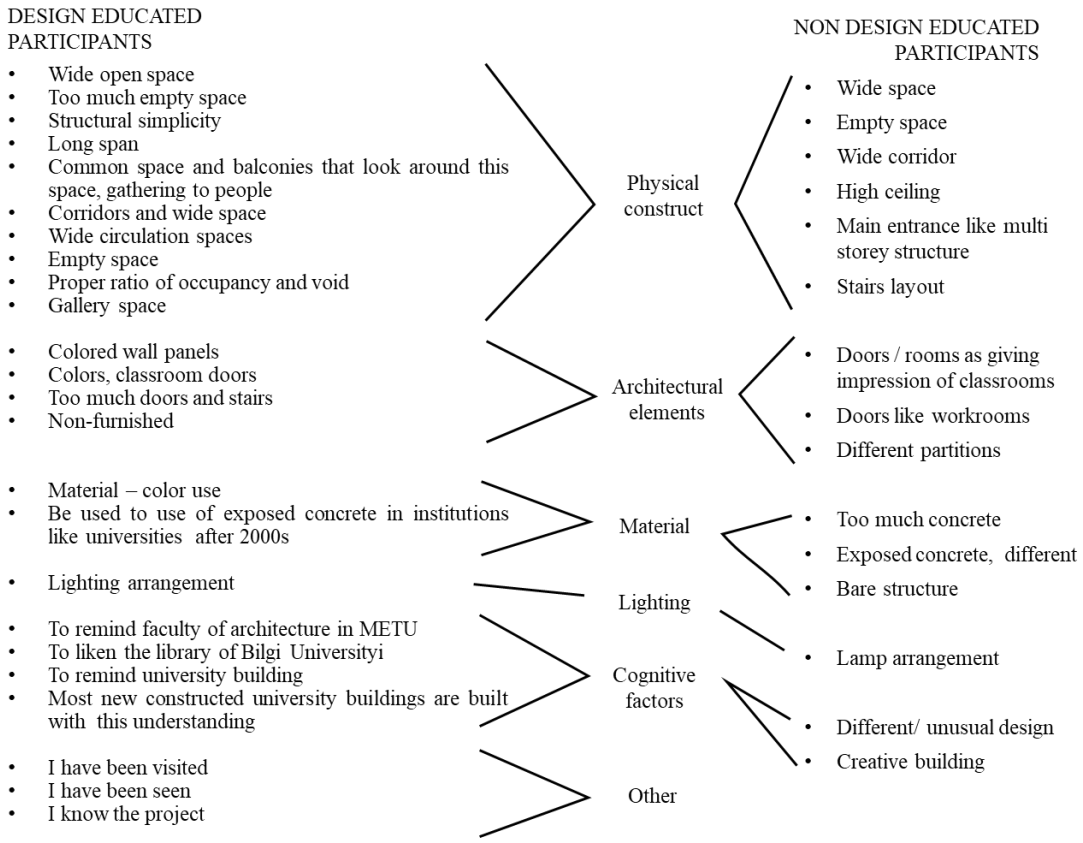


Table 5.2: Open-ended answers to question.

Responses are aimed to evaluate characteristics by categorizing with cognitive, physical and visual elements.

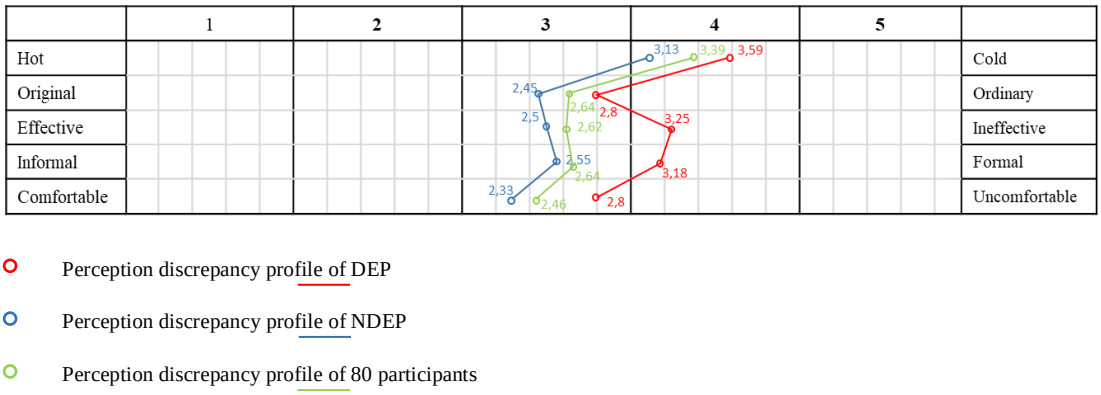
As a result of this problem, the majority of the answers related to the physical construction show that the users have an idea about the place and contribute more to the material.

In question 2, the perceptual characteristics were tried to be measured by using semantic evaluation with 5 adjective pairs (Table 3). With this method, the subjects' personal feelings about the place in the photograph that they have seen before were investigated subjectively instead of objective point of view.

Table 5.3: Table of adjective pairs in question 3.

	-2	-1	0	1	2	
Hot						Cold
Original						Ordinary
Effective						Ineffective
Informal						Formal
Comfortable						Uncomfortable

Table 5.4: Perceptual characteristics of adjective pairs.



Perception discrepancy profile of DEP

Perception discrepancy profile of NDEP

Perception discrepancy profile of 80 participants

As seen in the perception profile schema prepared with the help of Likert scale (Table 5), there is a parallelism in subjective evaluations. In contrast to what was predicted at the beginning of the research, participants who did not have design education had more positive approach to the structure. As it seen in above graphics, NDEP participants mostly evaluated with the positive adjectives like comfortable, informal, effective same as desgn educated participants. However, in the first abjectives as in Table 3, both subject group, ‘cold’ adjective was more preferred than ‘hot’ adjective. This result suggest that although the major rate of ‘like’evaluation, ‘cold’ evaluation do not show negative feeling.

Design **Nondesign**

Educated Participants - DEP **Educated Participants - NDEP**

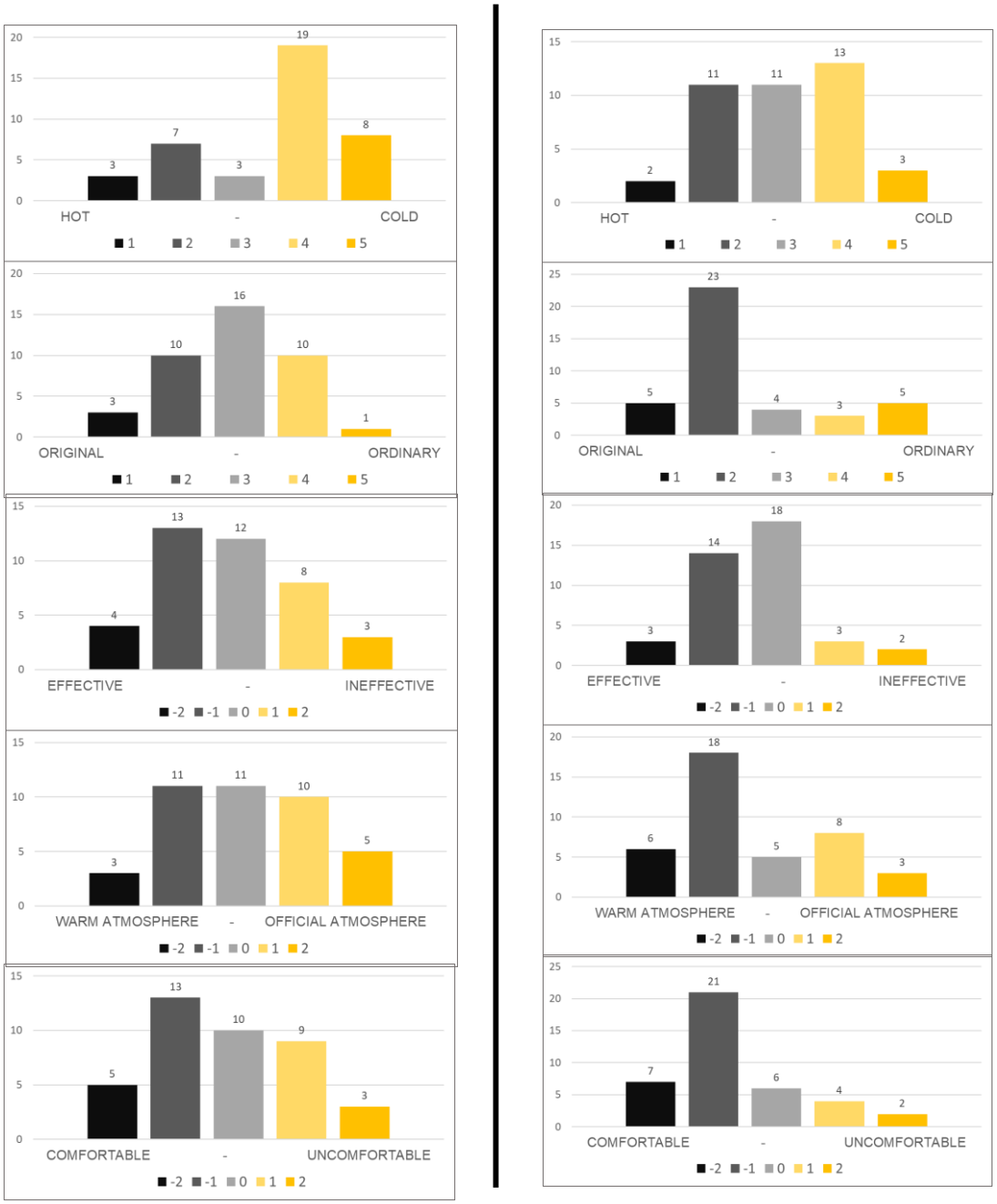


Figure 5.9: Numerical Datas on Adjective Pairs.

The numerical statistics according to the number of people in the measurement of perceptual characteristics are as above graphics. (Figure 5.9)

Design **Nondesign**

Educated Participants **Educated Participants**

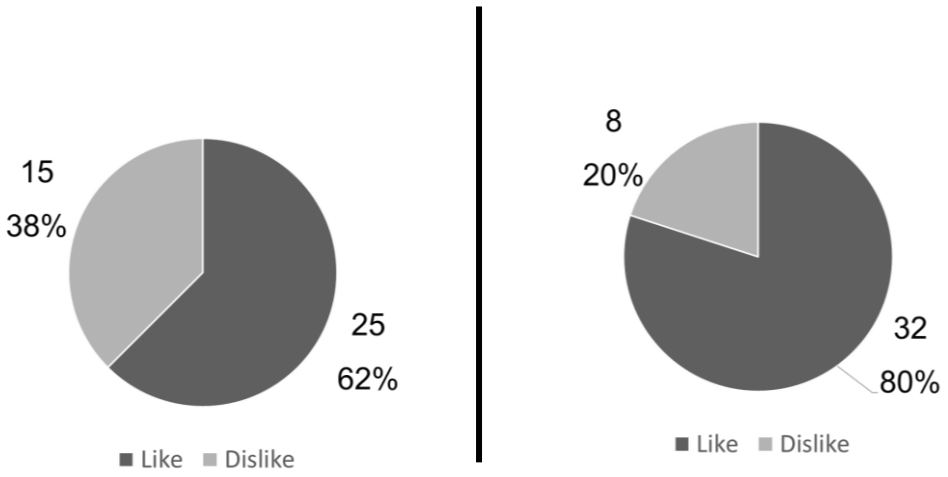


Figure 5.10: Positive- negative assessment rates of participants about space.

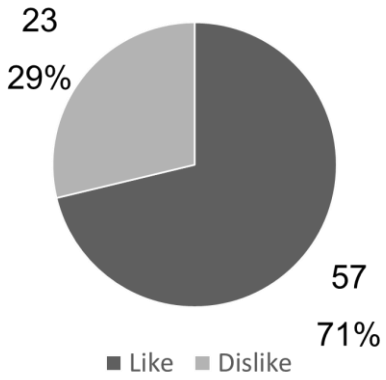


Figure 5.11: General overview of space for 80 participants.

It was aimed to evaluate that the general perspective of the users with the answers given to the adjective pairs in Question 4. The participants who has design education were expected to have a more positive approach to the gross concrete space. According to the survey results, 'liked' response was more in the users who didn't receive design education.(Figure 5.10) The general evaluation for the space was mostly positive (> 50%) in both experimental groups. (Figure 5.11)

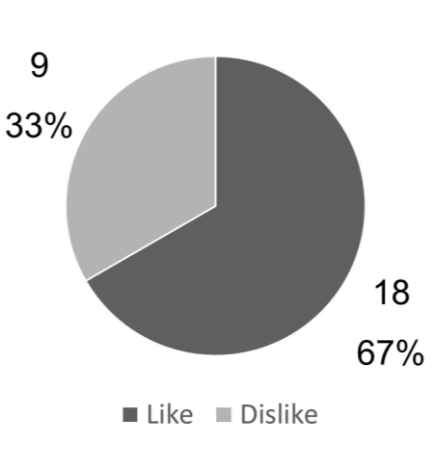


Figure 5.13: Positive-negative assessment rate of design educated participants who evaluated as "educational structure".

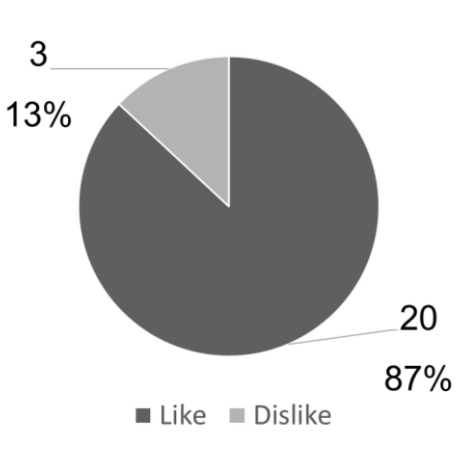


Figure 5.12: Positive-negative assessment rate of non design educated participants who evaluated as "educational structure".

In the first question, by looking at the answers of the participants in the 4th question, the perception that the space left on the subjects as the educational structure was examined. When they considered design training as a training structure, they gave more negative response (I didn't like) than the participants who didn't study design. Among the participants who received 40 design trainings, 27 people received an 'education structure' and 9 of these respondents considered this place as 'I didn't like' as a training structure. In the group of subjects who didn't receive design education, only 3 out of 23 people who evaluated the educational structure were found to be negative. However, the majority of respondents (> 50%) evaluated the educational structure as positive and gave 'I liked' that response.

5.1.1.3. Findings and discussions

In this study, which was conducted to create a pilot study on the thesis research on the relationship between material and perception; the subjective responses of the space seen in the photographs were evaluated. While open-ended questions were not intended to be directed by the participants, the feelings felt by the place in the person were measured by adjective pairs.

According to the results, it was seen that the physical characteristics and architectural composition of the space were more effective than the material properties in determining the type of structure of the participants.

When the classification of the participants who do not receive design education as education structure is examined; Large, high ceilings, empty space and colorful doors and staircase responses were seen. The second question of the faculty / faculty of architecture, answer to the question first was second different design, creative, raw structure, bare concrete. In the light of these answers, we can conclude that there is a material effect in architectural and contemporary design in those who consider it as is architecture faculty. The participants who didn't receive design education, who described them as 'different'; they responded by establishing a relationship with material and design. Responses to cognitive factors also affected the material-perception relationship. Contrary to the discussions on 44 schools within the scope of ISMEP project, this pilot study evaluates the majority with a positive, comfortable, original character and positively describes the space as liked. With this result, the questionnaire study, which consisted of the subject group of university students and graduate participants (between 18-26 years old, considered young), led to the questioning of their prejudices against gross concrete.

As a result of the evaluations of the participants who received design education as 'educational structure'; cognitive factors, physical constructs and equipment related to the educational structure of the answers were found to contribute to the relationship. While the design education infrastructure contributed to the work of the participants in interpreting the space and expressing their subjective ideas, their familiarity with the innovations and current trends the participants to both subjective and objective evaluations. Contrary to what was predicted at the beginning of the survey study, respondents who received design training showed a more neutral distribution in adjective couples. When evaluating the majority as I liked, the negative responses were higher than the subjects who didn't receive design education. With this result, it can be said that the educational infrastructure causes more different views in the relation of space and material.

In the photograph selected for the intensity of the gross concrete material, the colored gates in the background gave hints to the participants about the 'class, school', as predicted while the pilot work was being created, and provided an environment for evaluating the impact of physical properties on the perception of space. 'Empty, large, simple, multi-storey, open space' with the help of answers, such as the idea of the users to get an idea about the architectural design has been proven.

As a result of the analyzes and evaluations, with the 44 school projects of ISMEP, on the design of modern educational buildings that lead to discussions and different views; While evaluating the relationship between material, space and perception, it was seen that different evaluations emerged in individuals with the same perception development. Based on the different opinions of the students, including parents, educators, architects, psychologists, designers after the project was implemented; The subjective judgments of the participants with and without design education were evaluated. In this context, one of the most important factors on contemporary architecture and society in Turkey has been considered the relationship with the educational structure. In the project, which was based on the idea of 'schools of the future', the survey contributed to the perception of the relationship of the user and the designer from the perspective of the material.

5.1.2. Experimental study with the use of virtual reality

In this part, VR experiment on primary schools and this study's purposes with findings and discussions were given place.

5.1.2.1. Content and method

According to mentioned research about material perception (Wastiels, et al, 2013), it was suggested that people have biases about concrete in visual evaluation. However, when participants do not see the material, they evaluated the material with positive words. These inferences formed this experimental study. In terms of material preference, the participants was formed by selecting the same class students (7-8 ages). The reason of select this group was to not have perceptual value. 33 first-grade students participated the experimental study. Same classroom design is represented with two different appearance; ordinary and concrete dominantly classroom design.

VR is the technology that provide the environment which we can be part of it and involve the space in real time (Algahtani et al, 2017).

Figure 5.14: Everest VR Glasses - VR-0022 Model.

New developing technologies such as VR and augmented reality (AR) provide foundation for research which concerns usability because these technologies are too young. (Özgen, 2018)

The reason of using VR method is to give opportunity for participants that feeling in the space more realistic and giving an objective line of vision. Virtual reality is defined as a 'real or stimulated environment in which perceiver experiences intelligibleness – telepresence. Telepresence is also defined as the experience of being in an environment through a communication medium. (Mineev, 2017)

The reason to include children in the experimental study that they are in the beginning of the concrete operational period and when they perceive the concrete classrooms they can not only perceive the concepts but also express their feelings objectively and without prejudices.

To understand and examine this ideas, two different classrooms were designed with material variations. For both classrooms, physical elements / furniture were remained same however material and texture changes were applied. The material discrepancies were practiced for only walls and floors which are architecture elements when desks, chairs, chalkboard, door and windows, which are physical elements, were identified same color/material for both classroom designs.

Figure 5.15: Concrete texture which is used in renders.

Figure 5.16: Ordinary Classroom Design – OCD.

Figure 5.17: Ordinary Classroom Design – OCD.

Figure 5.18: Concrete Dominant Classroom Design – CDCD.

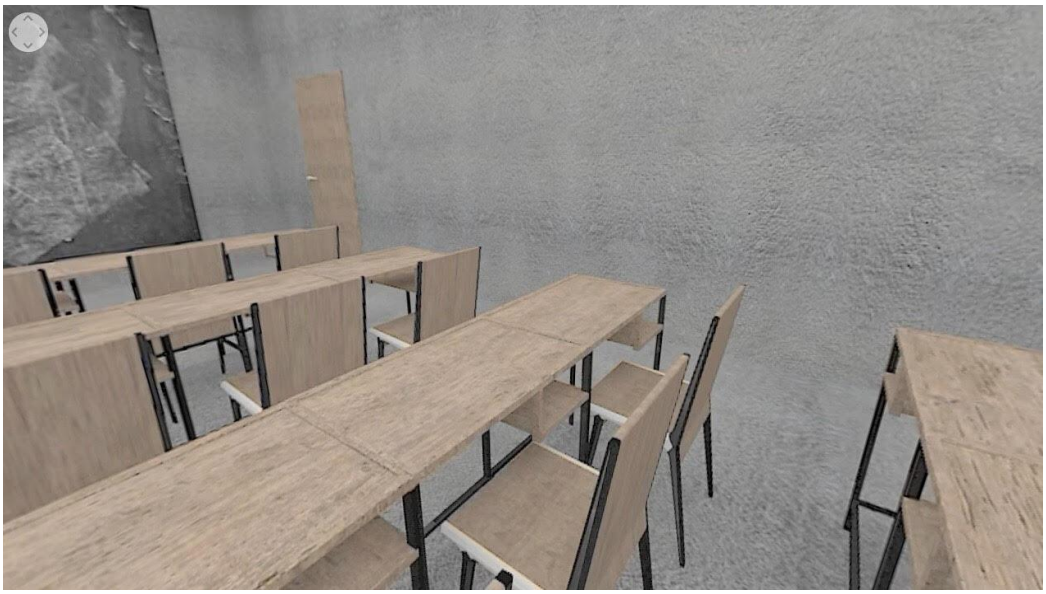


Figure 5.19: Concrete Dominant Classroom Design – CDCD.

First classroom design, which is called as OCD (Ordinary Classroom Design), was created with the contribution of ESMDSG (2005). Desks, teacher table, chairs, windows and door material was specified as wood texture, wall color was designed with two colors which are bright and tint of it. Floors are identified with bright ceramic texture. (Figure 5.16 and 5.17)

Second classroom design, which is called as CDCD (Concrete Dominantly Classroom Design), was created with the variation of OCD. Physical materials' textures or colors were kept same when walls and floors were designed with concrete texture as in figure

5.15. Textured surface material was used to create affective appearance. (5.18 and 5.19) Non-textured concrete was not used to not perceive as gray painted surface. Two colored wall design did not used to be different from OCD and regulations.

These two spaces were designed in 3DsMax and rendered for VR. These two VR videos were uploaded to Youtube and created a playlist to control the video changes via bluetooth remote controller. (Figure 5.20) Everest Vr Glas – VR022 model was used to show VR videos via Youtube. (Figure 5.14)

Figure 5.20: VR glass and remote controller.

For the objective results, three opinions were expected from children;

- 2 words were asked for both classroom design
- Asked about in which class they want to attend a class
- Asked about the reason of choosen classroom

In the first step, OCD or CDCD was showed to children and asked to express their thought in two words while wearing glasses. In second step, the image was changed to other classroom design and firstly asked about the classroom choice to attend a class and the reason. In the third and last step is that asking about their expressions in two words for second seen classroom. The reason for the asking about the choices before second video is to get first impressions and not forget to first video.

The main aim to ask their classroom choices that research about preference in terms of material perception. To compare with the previous case study, survey was evaluated by the concept of children's choices. Children who are at the beginning of perception development were preferred because they do not have prejudices in terms of preference.

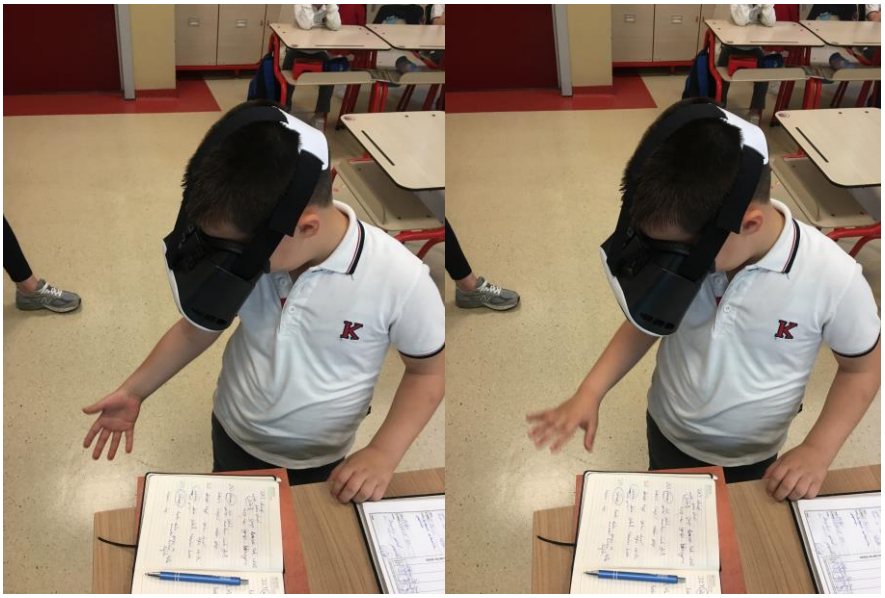


Figure 5.21: Photos from the experiment.

Figure 5.22: Photos during experiment.

Figure 5.23: Photos from experiment.

5.1.2.2. Overall discussion of findings

Findings were analysed into two groups. Firstly, selected classes and percentages were analysed (Figure 5.24) and secondly their words that expressed for two classes were classified. (Table 6)

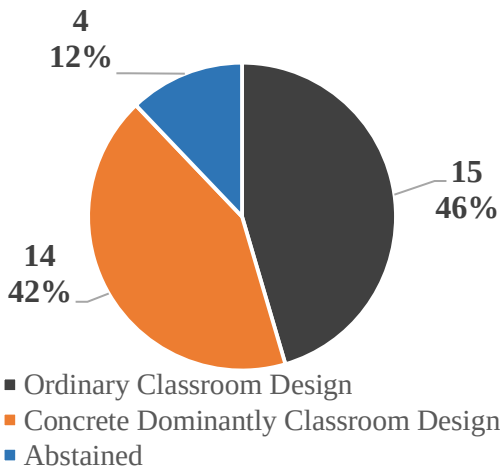
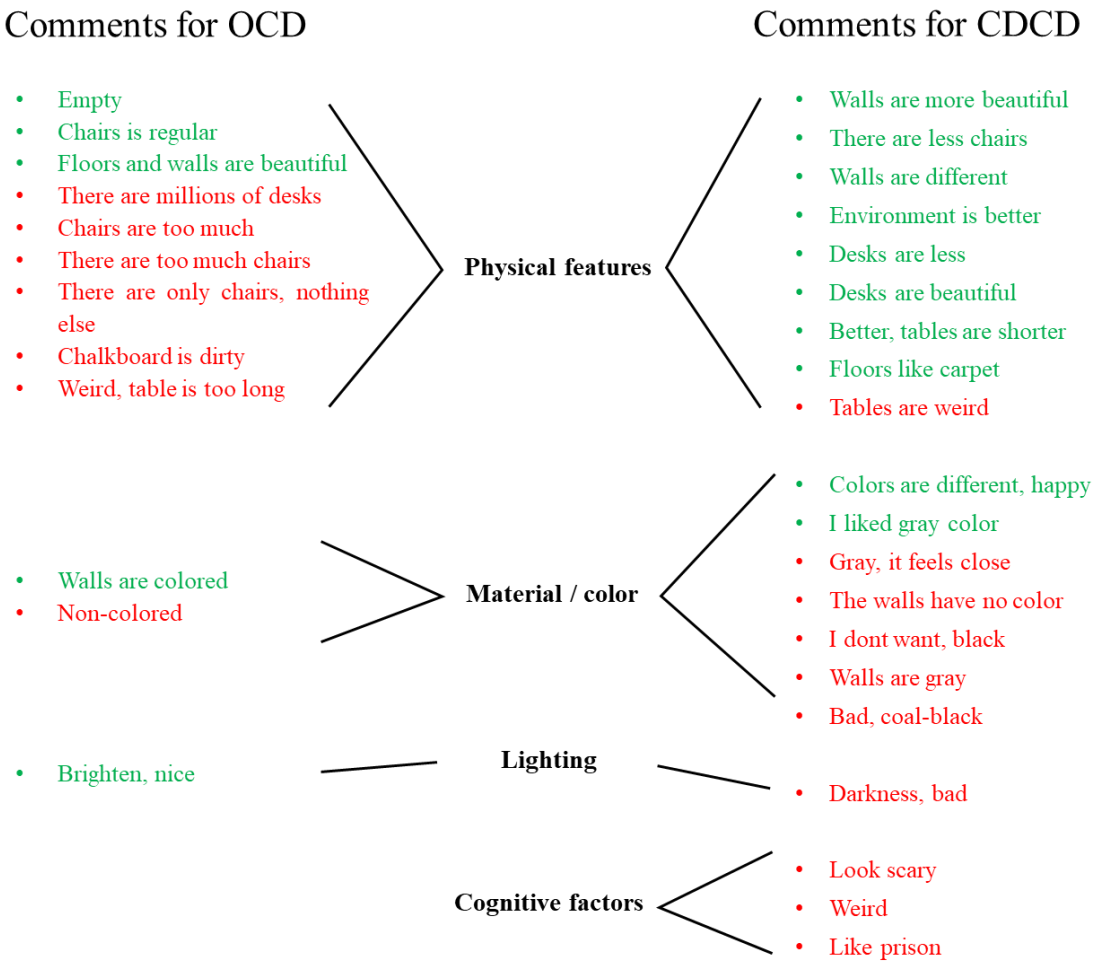


Figure 5.24: Graphic of classroom evaluation for 33 students.

As it seen above graphic, the classroom choices are almost equal. 14 of 33 students chose CDCD, 15 of 33 students chose OCD and 4 student is abstained. (Figure 5.25)

Table 5.5: Open-ended questions' categorization of VR experiment.



*Green answers show that the reason and expressions of the students who chose that classroom

*Red answers show that the reason and expressions why they did not choose that classroom

Students' answers and expressions/reasons to open-ended questions are grouped. (Table 5.5) This grouping is based on the previous field study. (Table 5.2)

As shown in above Table 6, CDCD preference and OCD preference were focused on physical feature descriptions. While positive comments were made to the physical characteristic of CDCD, negative comments were made mostly by participants who are not choosing OCD. The students, who chose OCD, also respond and have self-expression less than the students who chose CDCD in 'why?' question. As seen in the responses to open-endend questions (Table 6), the effects of cognitive factors for children, who are in the beginning of perception development and do not have the perception of 'classroom', was almost negligible. In the pre-operational period that visual perception is in developing and expressing feeling, children have evaluated what

they saw without prejudices. In the absence of prejudices, the effect of design with concrete material on user perception was close to common design and that has been demonstrated in this study.

Some of students described OCD with too much chairs / desks as a negative feature and some of them express their feelings like millions of desks , too much chairs unless both design has same number of physical elements in the same position. Same students preferred CDCD because they think that number of desks / chairs are more normal. This answers suggested that material can change the appearance of elements in a space.

As we saw above open-ended answers, students who do not choose CDCD evaluated negatively in terms of color / material. They describe with these words ‘gray, no color, close, coal black. This situation is not same for the students who prefer CDC. They did not evaluate color or material of the space in general.

Table 5.6: Student comments who did not choose any classes.

Student comments who did not choose both classes
- I dont want to attend a class non of them, two classes are same
- I dont want both of them
- I can attend the class both of them, there is no difference
- Both are same

As we see in above answers, 4 students although they are asked few times, have answered as ‘they are same, I don’t want to attend or it does not matter’. The videos repeated in sequence for 2 students but they were insisted that both classes are same. (Table 5.6)

Visual research methods have helped to understand the idea of material perception. Two studies were designed to evaluate material perception with different parameters and interpreted by emphasizing the importance of material and user relationship in interior space experience. In the two steps of field study, firstly effect of design education on user perception were research and secondly concrete perception and its’ relation with the experiences on children.

The increasing discussions about the use of concrete was not only as a structural element but also as a visual element in interior design, the fact that this material is applying in school structures which have one of the most significant impact on the development of children has steered the field studies.

Findings for both studies suggested that people have negative prejudices against the concrete material due to their experiences, cultural backgrounds, senses and etc. In the light of these studies, prejudices about the concrete material can be evaluated objectively and prejudices can be broken down.

Examining the relationship between material and perception from two different perspectives which are done with different participants who are expanded the scope of the study and contributed to the evaluation of the results from different aspects.

The method of the VR study was shaped with researches in different areas. In literature reviews, resources which are related to concepts of interior architecture, material and perception find insufficient for the field studies. Furthermore, for the future studies, the experiment can be performed on different age groups to the contribution for literature. In different age groups, results about their perceptual processes, interior design elements and material effects on user can provide the literature.

6. CONCLUSION

In this thesis, concepts of perception, material and school environments were considered. Researches about these consepts were analyzed and descriptive approach were used. The main attempt in this thesis that to obtain concrete/tangible results with the experimental studies under favour of descriptive researches of the concepts.

Hypotheses were formulated from the idea of using unusual materials in interior specified with concrete material. Therefore, the idea was supported with descriptions of perception, material and learning environments.

Perception was researched in terms of space, material and children. The research supported the idea of material in spaces is one of the most important elements in user perception. Process of perception is started with the senses like seeing, smelling, touching and therefore spaces are perceive with the help of each element in design including material. Children perception is also affected from every impact from the environment in each perceptual stages. Therefore, children perception is not only important for their development, but also have significant impact on societies.

In addition to the fact that the concrete has many significant contrubutions to the structures physically, the areas of use is quite wide thanks to different forms and components. The importance of concrete in construction and design history also affects today's structure. Besides being used as the main element in structures, concrete is included in the desigs as interior architectural elements. Therefore, the idea of concrete as a phenomenon provided research concept in this thesis.

Learning environments have many different parameters because these type of structures are the places where the most important stages of developmental period take place and children spend most of their time. Therefore, while physical comfort is provided ideally, the psychological and perceptual development of children in every period should be considered and included in design processes.

With reference to the literature review, the method and results of the research by Wastiels, L., Schifferstein, H.N.J., Wouters, I., Heylighen, A. (2013) which provides visual, tactile and general evaluation of material, stated that people have prejudices

about the materials and its feelings. To prove the idea of material perception field study was formed in 2 steps with different parameters.

With the help of preliminary study, theoretical approach was supported by experimental study. Questionnaire study has also conducted to hypothesis of the relationship between material and space perception by using visual that the exposed concrete material is predominated. Results claimed that people have prejudices about concrete material and if users do not have experiences from past like children, concrete design have also similar preference compare with the ordinary design.

For the İSMEP project, researches show that exposed concrete material in interior spaces can be called as 'new application' in Turkey however it is observed that the aim of Uygur Architects have not be done yet because the walls of the schools are not using as 'creative planes'. While discussions about these schools, it has been observed that walls and concrete partitions are not using for painting, writing, or any other function for children. (Figure 6.1)The idea of Uygurs' idea may have time to be common in Turkish culture also and therefore this situation shows that the importance of relationship between architecture and different parameters. This project provides a very significant laboratory environment as it enables opportunity to explore architecture and different concepts together.

Figure 6.1: Example of relation between children and 'creative walls' (Url 18-19).

This thesis will be pioneer to support the concepts of material, perception and school environments with the visual research methods. The combination of survey study with usual and VR experiment with designed space provided to compare different parameters in different research methods while these two studies are adequetly related with the concepts of material, user perception and learning environment. In VR

experiment study, results suggest that children, who are at the end of preoperational period and in the beginning of concrete operational period, material design in learning environment may not affect their perceptional process. They may perceive the space with physical elements mostly.

The thesis can lead to future studies which will be researched with different age groups, materials and spaces. For the future studies, material perception for different forms, colors and shapes can be researched. Perception can be researched with the objects which are different forms but same material and results can be evaluated in terms of material and perception while making comparison whit this thesis. According to Peter Zumthor (Frearson, 2013), form is the easiest property to control. However, as a result of field studies and its findings show that although for is an east to control factor in architecture, it has the most significant en most effective impact on user. Participants' evaluations were mostly about physical features. As a discussion topic of how concrete is used rather than using concrete can be on of the most important factors which affect perception of user. The discussions about the form and material can be extended discussions about different materials for each ages and materials for each form. It can be discussed that convenience of the material in different periods and its relation with interior spaces.

REFERENCES

Akçaer, G. & Soyluk A (2015, February). The Architecture Departments' Students Approach to The Reinforced Concrete Course. *7th World Conference on Educational Sciences,(WCES-2015)*, Greece. Retrieved from

Akalın, A. & Sezal, İ. (2009). Importance of Conceptual and Concrete Modelling in Architectural Design Education, *International Journal of Art & Design Education Vol 28, Issue 1,pp 14-24.* Retrieved from *https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1476-8070.2009.01589.x*

Alawadhi, H. (2010). *Form perception: an interactive guide to the Gestalt principles* (Master Thesis). Rochester Institute of Technology, *New York.*

Algahtani, A.S., Daghestani, L.F. & Ibrahim, L.F. (2017). Semi-Immersive Virtual Reality for Improving the Mental Rotation Skill for Engineering Students: An Experimental Study. *Journal of Computer Engineering & Information Technology 6:4.pp 1-9* doi: 10.4172/2324-9307.1000180.

Alpagut, L. (2005). *Erken Cumhuriyet Dönemi'nde Ankara'daki Eğitim Yapıları.* (Doktora Tezi). Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Sanat Tarihi Anabilim Dalı, Ankara.

Al-Zamil, F. A. (2017). The Impact of Design Elements on the Perception of Spaciousness in Interior Design. February 2017. Retrieved from http://www.journal.faa-design.com/pdf/7-2-zamil.pdf

Ambrose, J., & Tripeny, P. (2007). Simplified Design of Concrete Structures. *Wiley 8th Edition* pp. 1,2.

Arslanoğlu, Ö. (2017). Türkiye için Yeni Nesil Eğitim Binaları ve Sessiz Okul İlkesi için Fiziki Hazırlıklar *Harran Educational Journal* May 2017, 2(2), 1-17.

Aydınlı, S. (1979). Mekansal Değerlendirmede Algısal yargılara Dayalı Bir Model (Doktora Tezi), *İstanbul Teknik Üniversitesi Fen Bilimleri Enstitüsü*, İstanbul.

Babaoğlu, Ş.N. (2007). *Okul Öncesi Eğitim Merkezleri: Antalya Şehri, Lara-Arapsuyu-Dokuma/Çallı/Bayındır Semtleri Alan Çalışması* (Master Thesis). İstanbul Technical University Faculty of Architecture.

Bake, S., & Nolan, B. (2009). Concrete Design Book on Implicit Performance. *Bureaubakker, Febercem.*

Balamir, A. (2017). Şaşkınlıklar Diyarında İki Mimar. *Arredamento Mimarlık Tasarım Kültür Dergisi* Şubat 2017 pp 42-74.

Banham, R. (2010). 1955 December: 'The New Brutalism. *The Architectural Review July.* Retrieved from

https://artearquiteturadesign2.files.wordpress.com/2014/10/1955-december_-the-new-brutalism-by-reyner-banham-_-archive-_-architectural-review.pdf

Bayhan, P. ve Artan İ., (2007). Çocuk Gelişimi ve Eğitimi. *İstanbul: Morpa Kültür Yayınları.*

Bauer, P., (1997). Development of Memory in Early Childhood. In N. Cowan and C. Hulme (Ed.), *The Development of Memory in Childhood Psychology Press, NY*

Beall, C. (2001). Masonry and Concrete. *New York: McGraw-Hill,*.Chapter 2 - Understanding Concrete.

Berger, J. (1986). Ways of Seeing. *Penguin Books Ltd. London.*

Berger, J. (1989). Seeing is Believing: An Introduction to Visual Communication. *Mayfield Publishing Co, US.*

Budak, Y., Kurt, G.D., Kula, S.S. (2018). Bilişsel Gelişimde Farklı Bir Görüş Geliştiren Henry Wallon ve Jean Piaget'nin Görüşlerinin Karşılaştırılmalı Olarak İncelenmesi. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi* V. 48, pp. 415-436.

Calder, B. (2015). 'The sweetest music you will ever hear': structural and programmatic uses of concrete by Denys Lasdun & Partners. *The Journal Of Architecture, 20(3), 376-418.* doi: 10.1080/13602365.2015.1039046

Calder, B. (2016). Raw Concrete. *London: William Heinemann.*

Cansever, T. (2014). Kubbeyi Yere Koymamak. *Timaş Yayınları, İstanbul.*

Ciravoğlu, A. (2004). Çocuk Mekanlarını Tasarlamak: Ana ve İlköğretim Okulları. *Journal of Mimarist 2004 / 1 pp 38-39.*

Concrete meaning in the Cambridge English Dictionary (2019). Retrieved from https://dictionary.cambridge.org/dictionary/english/concrete

Digital Engineering Library (2004). Understanding Concrete *Chapter 2 pp.7-35.*

Donovan, R. J., & Rossiter, J. R. (1981). Store atmosphere: An environmental psychology approach. *New York: Graduate School of Business, Columbia University*.

Einifar, A., & Tabaeian, S. (2011). A Study of the Perspectives of Architectural and Environmental Psychology. *International Journal of Architecture and Urban Development*,1(1), 28-31.

Essays, UK. (2013). The History Of Ancient Concrete Construction Construction Essay. Retrieved from https://www.uniassignment.com/essay-samples/construction/the-history-of-ancient-concrete-construction-construction-essay.php?vref=1

Erişti, S.D., Uluuysal, B. , Dindar, M. (2013). Görsel Algı Kuramlarına Dayalı Etkileşimli Br Öğretim Ortamı Tasarımı ve Ortama İlişkin Öğrenci Görüşleri. *Anadolu Journal of Educational Sciences International*, January 2013, 3(1).

European Union (2017). Open Schools for Open Societies. *Open Schooling Model D2.* Retrieved from https://cordis.europa.eu/project/rcn/210250/factsheet/en

Thornberg, J.M. (1973). Environmental Design Research-Volume I – Selected Papers in Preiser,W, (Ed.), Child's Conception of Places to Live In pp.178-190.

Forty, A. (2012). Concrete and Culture- A Material History. *Reaktion Bookd Ltd, London.*

Frearson, A. (2013). Architecture is not about form – Peter Zumthor. Retrieved from https://www.dezeen.com/2013/02/06/peter-zumthor-at-the-royal-gold-medal-lecture-2013/

Gibson, J. J. (1979). The Ecological Approach to Visual Perception. *Boston: Houghton Mifflin Company.*

Gibson, E. J. (1977). How Perception Really Develops: Aview from outside the Network Basic processes in Reading: Perception and comprehension. *Hillsdale, NJ: Erlbaum* pp. 155- 173.

Gifford, R. (2002). Environmental Psychology: Pirinciples and Practice. *Colville, WA.* Retrieved from

https://www.researchgate.net/publication/256446187_Environmental_Psychology_Principles_and_Practice

Grima López, R., Aguado de Cea, A., & Gómez Serrano, J. (2013). Gaudí and Reinforced Concrete in Construction. *International Journal Of Architectural Heritage, 7(4), 375-402.* doi: 10.1080/15583058.2011.632470

Gür, Ş.Ö. (2002). Çocuk Mekanları. *Yapı Endüstri Merkezi Yayınları,* İstanbul.

Gür, Ş.Ö. (2004). İlköğreti Okullarının Tasarımında Yer Seçimi Kararları ve Dersliklerin Yönlenmesi ile İlgili Öneriler: İlköğretim Okullarında 'Boş Zaman Kavramı' *Mimarist 2004 /1 pp. 46-53.*

Halbwachs, M. (1925). Maurice Halbwachs on Collective Memory (L. A.Coser, Çev) 1992, *The University of Chicago Press, Chicago and London.*

Hançerlioğlu, O. (1992). Felsefe Ansiklopedisi. *Remzi Kitapevi, İstanbul.*

Harvey, R. (2000). Sensation and Perception. *John Wiley&Sons, New York*

Hernanfez, J. J. M., Valerdi, M. C. (2015). Occupants' Perception of a Concrete Shell Buildings. *Journal of Engineering and Architecture June 2015, Vol. 3, No.1 pp.116-127.*

Holl, S., Pallasmaa, J., Alberto, P.G. (2006). Questions of Perfection: Phenomenology in Architecture. *William K Stout Pub.*

Hsu, H.L., Chang, Y.L., & Lin, H.H. (2015). Emotional Architecture – A Study of Tadao Ando's Genius Loci Design Philosopy and Design Syntax. *International Journal of Chemical, Environmental & Biological Sciences (IJCEBS) Volume 3, Issue 6.*

İnan, D. (2006). Mimar Kemalettin Bey'i Anma Etkinlikleri Başladı. *Mimarlık Dergisi 332*. Retrieved from http://www.mimarlikdergisi.com/index.cfm?sayfa=mimarlik&DergiSayi=50&RecID=1202#

Ittelson, W.H. (1976). Environmental Psychology; People and Their Physical Settings. *Holt, Rinehart and Winston, Inc. Second Edition, 51-59 pp.*

Karagüler, M. E. (2014). Mimari Beton Uygulamaları. *Beton 2013 Hazır Beton Kongresi*, İTÜ Mimarlık Fakültesi, İstanbul.

Katz, D. (1989). In the World of Touch. *L. E. Krueger, Laurance Erlbaum, Hillsdale*

Kol, S. (2011). Erken Çocuklukta Bilişsel Gelişim ve Dil Gelişimi. *Sakarya Üniversitesi Eğitim Fakültesi Dergisi, 21 Mayıs 2011 pp. 1-21*.

Laisen, K., Gilliland, J., Hess, P., Tucker, P., Irwin, J., & He, M. (2009). The Influence of the Physical Environment and Sociodemographic Characteristics on Children's Mode of Travel to and From School. *American Journal of Public Health Vol 99 No 3 pp. 520-526.*

Lang, J. (1987). Creating Architectural Theory: The Role of the Behavioral Sciences in Environmental Design. *Van Nostrand Reinhold, NY.*

Lawson, B. (1994). Design in Mind. *Butterworth Architecture, Oxford, UK.*

Likert, R. (1932). A Technique for the Measurement of Attitudes. *Archives of Psychology, Vol.22, ss. 5-55.*

Lipsitt, L.H, Engen T., Kaye, H. (1963). Developmental Changes in the Olfactory Threshold of the Neonate. *Child Development, Vol 34, No.2*. Retrieved from https://www.jstor.org/stable/1126733?seq=1/subjects

Liu, J., Ou, Z., Peng, W., Guo, T., Deng, W, Chen, Y. (2017*).* Literature Review of Coral Concrete. *Arabian Journal for Science and Engineering, 43:* doi.org/10.1007/s13369-017-2705-x

Mahmoud, H. (2017). *Interior Architectural Elements that Affect Human Psychology and Behavior*. The Academic Research Community Publication, 1(1), 10. doi: 10.21625/archive.v1i1.112

Material Masters: Le Corbusier's Love for Concrete. (2019). Retrieved from https://www.archdaily.com/574981/material-masters-le-corbusier-s-love-for-concrete

McLeod, S. (2009)**.** Jean Piaget's Theory of Cognitive Development. Retrieved from *https://www.simplypsychology.org/piaget.html*

Mealings, K.T.,, Dillon, H., Buchholz, J.M., Demuth, K. (2015). An Assessment of Open Plan and Enclosed Classroom Listening Environments for Young Children: Part 1 – Children's Questionnaires. *Journal of educational, Pediatric & Habilitiative Audiology Vol 1., 2015*.

Milli Eğitim Bakanlığı İnşaat ve Emlak Dairesi Başkanlığı (2015). Eğitim Yapilari Asgari Tasarim Standartlari Kilavuzu.

Mineev, G. (2017). *The Impact of Immersive Virtual Reality on Effectiveness of Educational Games* (Master Thesis). Utrecht University Faculty of Science Game and Media Technology, August 2017.

Mirzabagheri, S., Tasnimi, A.A:, Issa, F. (2018). Experimental And Numerical Study of Reinforced Concrete İnterior Wide Beam-Column Joints Subjected to Lateral Load. *Canadian Journal of Civil Engineering 2018,45:947-957* doi.org/10.1139/cjce-2018-0049

Moss, J., Pini, B. (2016). Visual Research Methods in Educational Research *Macmillan Publishers Limited, New York.*

Myhrberg, K. (2011). *Heritage from the Communist Period in Albania – An Unwanted Heritage Today?* (Master Project). University of Gothenburg Department of Conversation.

Nalbantoğlu, H.Ü. (1997). Teknoloji Sorununa Bazı Felsefi Yaklaşımlar Üzerine *Mimarlık 276*

Neufert, E. (2000). Neufert Yapı Tasarımı. *Yapı Endüstri Merkezi Yayınları.*

Ocak, M.T., Tekin, Ö.F. (2019). Anadolu Feneri Koruganları. *Betonart Journal 06/2019 66-71 pp.*

Öymen Özak, N. (2008). *Bellek ve Mimarlık İlişkisi Kalıcı Bellekte Mekansal Öğeler* (Doktora Tezi) İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitürüsü, İstanbul.

Özgen, D.S. (2018). *Assessing Usability of Virtual Reality for Basic Design Education* (M.A. Thesis). Bilkent University Department of Interior Architecture and Environmental Design, Ankara.

Pallasmaa J. (2005). The Eyes of the Skin: Architecture and Senses. *London, UK: Wiley-Academy.*

Parnell, S. (2011). Ethics VS Aesthetics Architectural Design 1965-1972. *A Free Journal for Architecture January 2011, Vol 4 pp. 49-54.*

Payne, J. (2014). The Strange Case of The Albanian Bunker *Log 31, pp.161-168*

Perez-Gomez, A. (2006) Questions of Perfection: Phenomenology in Architecture. *William K Stout Pub.*

Perren, C., Mlecek, M. (2015). PERCEPTION in Architecture: Here and Now *Cambridge Scholars Publishing.*

Philips, D., Yamashita, M. (2012). Detail in Contemporary Concrete Architecture. *Laurence King Publishing Ltd, London.*

Piaget, J. (1969). The Child's Conception of the World. *Totowa, Adams, NJ Littlefield*

Piaget, J. (1936). Origins of Intelligence in the Child. *London: Routledge & Kegan Paul*

Piaget, J. (1981). Intelligence and Affectivity: Their Relation During Child Development. *Palo Alto.*

Piaget, J ve Inhelder B., (1956). "Topological space" The child's Conception of Space. *Routledge and Kegan Paul, London*

Pop, D. (2013). Space Perception and Its Implication in Architectural Design. *Acta Technica Napocensis: Civil Engineering & Architecture Vol. 56, No. 2.*

Quddus, S. (2014). Material Masters: Le Corbusier's Love for Concrete. Retrieved from https://www.archdaily.com/574981/material-masters-le-corbusier-s-love-for-concrete

Rapoport, A. (1977). Human Aspects of Urban Form-Towards a Man-Environment Approach to Urban Form and Design. *Pergamon 1st Edition.*

Sanoff, H. (2001). School Building Assessment Method. Retrieved from

https://www.researchgate.net/publication/234733934_School_Building_Assessment_Methods

Saunders, C. Ruthowski, A.F., Genuchten, M., Vogel, D. Orrege, J.M. (2012). Virtual Space and Place: Theory and Test. *MIS Quarterly Vol:36.*

Schaeffer, R.E. (1992). Reinforced Concrete, Preliminary design for Architects and Builders. *McGraw-Hill Inc.* http://www.arch.mcgill.ca/prof/sijpkes/abc-structures-2005/concrete/timeline.html

Schmitt, N.G. (1999). Information Architecture: Basis and Future of CAAD. *Berlin: Birkhauser*

Seçkin, N.P. (2010). *Mimaride Malzeme Algısı: Dokunsal ve görsel Deneyimlerin Değerlendirilmesi* (Doktora Tezi) Mimar Sinan Güzel Sanatlar Üniversitesi Fen Bilimleri Enstitüsü, İstanbul

Senemoğlu, N. (2009). Gelişim Öğrenme Ve Öğretim, Kuramdan Uygulamaya. *Pegem Akademi, 14. Baskı, Ankara*

Sharr, A. (2007). Thinkers for Architects:Heidegger for Architects. *Routledge, New York*

Shemesh, A., Bar M., Grobman, Y.J. (2015). Space and Human Perception-Exploring Our Reaction to Different Geometries of Spaces. *20th International Conference of the Association of Computer-Aided Architectural Design Research in Asia CAADRIA 2015, At South Korea.*

Soliman, O. A. (2013). Perception of Building Materials in Architecture. *Journal of Engineering and Applied Science: Cairo University Vol 60 No 6.*

Sully, A. (2015). Interior Design: Conceptual Basis. *37-51. Springer International Publishing Switzerland.*

Tabaeian, S., Einifar, A. (2011). A Study of the Perspectives of Architectural and Environmental Psychology. *International Journal of Architecture and Urban Development ,1(1), 28-31.*

Tan, A. (2015). *While Stands the Colosseum: A Ground-Up Exploration of Ancient Roman Construction Techniques using Virtual Reality*. (Ph.D. Dissertation) The Ohio State University.

The History Of Ancient Concrete Construction Construction Essay. Retrieved from *http://www.uniassignment.com/essay-samples/construction/the-history-of-ancient-concrete-construction-constructionessay.php*

Thornburg, H.D. (1973). Behavior and values: Consistency or inconsistency? Adolescence. Retrieved from

https://www.researchgate.net/publication/232520826_Behavior_and_values_Consistency_or_inconsistency

Topçu, A. (2014). Betonarme 1756-2014. *Eskişehir Osmangazi Üniversitesi, Mühendislik Mimarlık Fakültesi*. Retrieved from

http://mmf2.ogu.edu.tr/atopcu/index_dosyalar/Tarih/BeTarihi.pdf

Trias, E. (2015). Phenomenology and Architecture- Bruder Klaus Chapel Peter Zumthor. *University of Brighton*

Uygur, S. (2015). Bu Duvarlar Öğrencilerin Yaratıcılıklarına Bir Pano Oluşturuyor. Interview. October. Retrieved from

http://www.arkitera.com/soylesi/784/bizde-sehirlesmeye-betonlasma-diyorlar-halbuki-beton-bir-yapi-malzemesi

Ünlü, A. (1998). Çevresel Tasarımda İlk Kavramlar. *İstanbul Teknik Üniversitesi Baskı Atölyesi*

Valbuena, P. (2013). Patterns in Architecture: Space, Time and Perception. Retrieved from https://www.archilovers.com/stories/3881/patterns-in-architecture-space-time-and-perception.html

Wal D.M. (2017). *Architecture of Affect-conceptions of concrete in brutalist buildings* (Master Thesis). Radboud University' Nijmegen Department of Literaty and Cultural Studies.

Wastiels, L., Schifferstein, H.N.J., Wouters, I., Heylighen, A. (2013). Touching Materials Visually: About the Dominance ıf Vision in Building Material Assessment. *International Journal of Design, 7(2), 31-41*.

Yeteroğlu, E.(2015). *Socıetá Operaıa Italıana Di Istanbul Binası Restorasyon Projesi* (Master Thesis*)* İstanbul Teknik Üniversitesi Fen Bilimleri Enstitüsü, 2015.

Zumthor, P. (2006). Thinking Architecture .*Birkhauser*

Zuo, H. (2005). Report on the Sensory Perception of Materials within the Product Context. *Remington, UK*. Retrieved from http://jfa.arch.metu.edu.tr/archive/0258-5316/2010/cilt27/sayi_2/301-319.pdf

Zuo, H. (2010). The Selection of Materials to Match Human Sensory Adaptation and Aesthetic Expectation in Industrial Design. *METU JFA 2010/2 301-319*

Url-1<*https://medium.com/@invisiblestudio/how-to-transform-a-communist-bunker-in-an-emotional-museum-9b2268e637df*> date retrieved 14.04.2019

Url-2<*https://roadsandkingdoms.com/2017/albanias-bunker-problem/*>date retrieved 22.04.2019

Url-3 <https://www.artstation.com/artwork/kaXb0> date retrieved 30.03.2019

Url-4<https://www.mirror.co.uk/news/uk-news/inside-forgotten-cold-war-bunker-9317215> date retrieved 05.04.2019

Url-5 <https://www.archdaily.com/106352/bruder-klaus-field-chapel-peter-zumthor> date retrieved 22.04.2019

Url-6<https://www.theguardian.com/artanddesign/gallery/2018/oct/24/donald-niebyl-crazy-concrete-yugoslavias-war-memorials-in-pictures-spomenik-tito>date retrieved 28.04.2019

Url-7<http://www.zaha-hadid.com/design/knitcandela/>date retrieved 28.04.2019

Url-8<https://www.messynessychic.com/2016/03/15/classrooms-without-walls-a-forgotten-age-of-open-air-schools/>date retrieved 20.04.2019

Url-9 <http://www.arkitera.com/etiket/46214/ismep> date retrieved 20.04.2019

Url-10 < http://tcmodern.com/john-lautner/> date retrieved 20.04.2019

Url-11<https://archinect.com/features/article/113594683/showcase-garden-school-beijing-no-4-high-school-fangshan-campus-by-open-architecture> date retrieved 20.04.2019

Url-12<https://lovecraftianscience.wordpress.com/tag/non-euclidean-geometry/> date retrieved 20.05.2019

Url-13< https://www.interiordesign.net/slideshows/detail/9526-b-architecten-draws-on-modernist-archetypes-for-remodel-of-1930-s-belgian-house/> date retrieved 20.04.2019

Url-14https://www.pinterest.co.uk/pin/188166090664567156/?lp=true date retrieved 20.04.2019

Url-15< https://www.archdaily.com/793126/h3-house-luciano-kruk> date retrieved 20.04.2019

Url-16< https://pro.europeana.eu/post/20c-school-history> date retrieved 16.05.2019

Url-17<http://www.everest-global.eu/nl/product/everest-vr-0022-vr-box-virtual-reality-goggle> date retrieved 22.5.2019

Url-18<https://www.designdazzle.com/magnetic-wall-and-fun-shapes/> date retrieved 20.06.2019

Url-19<https://www.thebetterindia.com/36507/happy-school-project-painting-school-walls-nagpur/> date retrieved 22.06.2019

APPENDIX A

İSTANBUL TEKNİK ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
ULUSLARARASI İÇ MİMARİ TASARIM YÜKSEK LİSANS PROGRAMI
TEZ ARAŞTIRMASI ALAN ÇALIŞMASIDIR

1) Fotoğrafta görmüş olduğunuz yapı sizce ne binasıdır?

....

2) Cevabınızın nedenini tek cümle ile açıklayınız.

....

3) Aşağıda gördüğünüz sıfat çiftlerinden size uygun olan değeri işaretleyiniz.

	1	2	3	4	5	
Sıcak						Soğuk
Özgün						Sıradan
Etkili						Etkisiz
Samimi						Resmi
Rahat						Rahatsız

4) Görmüş olduğunuz fotoğraftaki mekanı;
  a) Sevdim
  b) Sevmedim olarak mı değerlendirirsiniz?

Figure A.1: Preliminary study form

APPENDIX B

Consent Form

Tarih: 23.05.2019

Bu formun amacı katılmanız rica edilen araştırma ile ilgili olarak sizi bilgilendirmek ve katılmanız ile ilgili izin almaktır.

Bu kapsamda İstanbul Teknik Üniversitesi İç Mimarlık Anabilim Dalı, Uluslararası İç Mimari Tasarım Yüksek Lisans programında, "Using Visual Research Methods to Understand Perception of Concrete in Interior." başlıklı araştırma "Beren Seymen" tarafından **gönüllü katılımcılarla** yürütülmektedir. Araştırma sırasında sizden alınacak bilgiler gizli tutulacak ve sadece araştırma amaçlı kullanılacaktır. Araştırma sürecinde konu ile ilgili her türlü soru ve görüşleriniz için aşağıda iletişim bilgisi bulunan araştırmacıyla görüşebilirsiniz. Bu formu onaylamanız, **araştırmaya katılım için onam verdiğiniz** anlamına gelecektir.

Araştırmayla İlgili Bilgiler:

Araştırmanın Amacı: Algı kavramını, önyargı ve tecrübelerin etkisi olmadan araştırmak

Araştırmanın Yöntemi: Algı gelişimi henüz tamamlanmamış, 7-8 yaşlarındaki çocuklara VR gözlüğünde beton ağırlıklı tasarlanmış sınıf ile alışılmış tasarımlı sınıf gösterilerek açık uçlu sorular sorarak önyargıların sosyal çevre ile ilgili olup olmadığını kanıtlamak.
Öğrencilere önce alışılmış tasarımlı sınıf, daha sonra beton ağırlıktı sınıf gösterilecek ve her iki sınıfı da iki kelimeyle tanımlamalarını ve hangi sınıfta derse girmeyi tercih edilecekleri sorulacak.

Çalışmaya Katılım Onayı:

Katılmam beklenen çalışmanın amacını, nedenini, katılmam gereken süreyi ve yeri ile ilgili bilgileri okudum ve gönüllü olarak çalışma süresince üzerime düşen sorumlulukları anladım. Çalışma ile ilgili ayrıntılı açıklamalar sözlü olarak araştırmacı tarafından yapıldı.

Bu araştırmaya kendi isteğimle, hiçbir baskı ve zorlama olmaksızın katılmayı kabul ediyorum.

Katılımcının (Islak imzası ile)

Adı-Soyadı: [illegible]

İmzası:

TED Trabzon
Özel Lisesi
Müdür Yardımcısı
ANIL ASAN

Araştırmacının

Adı-Soyadı: Beren SEYMEN

e-posta: berenseymen@gmail.com

İmzası:

Figure A.2: Experimental study consent form

CURRICULUM VITAE

Name Surname: Beren Seymen

Mobile Phone: +90505 336 68 77

E-mail: berenseymenn@gmail.com

EDUCATION

- **M.A.** İstanbul Technical University - Internatonal Master of Interior Archtectural Design (IMIAD)
- **Exchange** IMIAD Student Hochschule für Technik – Stuttgart – 2017
- **B.A.** Bilkent University – Interior Architecture and Environmental Design – 2016
- **Summer School** University of Arts London – Drawing – 2015
- **High School** Tevfik Serdar Anatolian High School – Trabzon – 2011

WORK EXPERIENCE AND INTERNSHIP

- Bahar Lighting – Interior Architect and Abroad Projects Representative / January 2018 – still
- Craft 312 Studio – Office Internship – Ankara – 2014
- Başaran Group – Ramada Plaza, Spa & Otel Construction Internship – Trabzon – 2014
- Bilkent University- Guide Student – Ankara – 2014 - 2016