Research Article

Experiencing the space with a phenomenological approach: A method proposal for relating the senses with representation and design

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Abstract

Today, in design education, designers can focus on image production rather than the experience of the space and the tactile qualities of the materials used. The study which was held with reference to this situation, aims to develop holistic perception skills; to discuss the interactive roles of the senses in perception and representation; to raise awareness about the concepts of place, volume, space; and to use this awareness in design. Within the scope of the workshop conducted with the undergraduate students of Mimar Sinan Fine Arts University, Department of Interior Architecture, the participants were asked to do sensory reading exercises in the places they chose and then to represent their sensations and to use this data in the design of a city furniture. After the design process a survey was conducted to get feedback from the students. The results confirm that vision is the primary sense in perception; the fact that students focus on different senses in the space did not change this situation. In the stage of representation, the form and movement elements in the spaces were the most effective. The significant relationship between reflection and design phases showed that representation studies have positive effects on design processes and that such practices can be included more frequently in education programs.

Keywords: Design Education, Experiential Learning, Phenomenological Approach, Representation, Sensual Perception.

INTRODUCTION

Today, it is seen that the changes in many fields together with the technological developments also affect the design education. Furthermore, the processes such as inspiration, representation and thinking are mainly based on the sense of sight. In design education, without internalizing the necessary information with sensory awareness or understanding the realities of design, phenomenological structure and the relationships between all these concepts, students tend to focus solely on the visual phenomenon. Hand drawings and models which were the main methods in design and representation in the past and could also be considered as thinking tools are replaced by models made in the computer environment; besides, virtual reality and three-dimensional simulations give the impression that the design has come to life before it has been made. While the internet environment offers unlimited experience possibilities through virtual spaces, it carries risks of manipulating mental processes in addition to homogenizing and superficializing communication. Although the ease of access to many data and other factors stand out as advantages in the education process, the fact that these experiences are predominantly based on the senses of sight and hearing, causes holistic experiences in which the body takes part along with the other senses to remain relatively in the background.

However, architecture is a concept that can be perceived and explained by multiple senses; it connects people mentally, perceptually, and physically while also taking a place in their memory, emotional world and life and giving the experience of existence. Parallel to this, architecture and interior design are disciplines for planning livable atmospheres where practical, aesthetic, symbolic functions in addition to physical and sensory properties of materials are prioritized. Consciously or unconsciously, our body is in constant dialogue with the environment, and with this awareness, the designer should be able to make conscious decisions regarding the use and effects of elements such as the quality of the space, textural features, juxtapositions, contrasts, light,

color, and materials (Brown & Farrelly, 2012: 76). Pallasmaa (2019: 50), in his book Eyes of the Skin, mentioned that an architectural phenomenon is experienced as fully embodied with its material and spiritual presence since it contains many sensory experiences that interact and fuse with one another instead of mere sight or the classical five senses. Accordingly, the essence of existential space lies in the multisensory perception capacity that permeates the phenomenological understanding of architecture. "Our senses and our entire body directly construct, produce and store silent existential knowledge. The human body is a knowing being. Our entire being in the world is a sensuous and embodied mode of existence, and this feeling is the basis of existential knowledge" (Pallasmaa, 2009: 128). Rapaport (1987) stated that space is perceived in real terms from the moment it is defined by senses other than sight. Based on this point of view, Noel Arnaud made the comment "I am the space where I am" whereas Soygeniş (2006) emphasized that space appeals to the five senses of human beings and should be handled together with experiences.

In the literature review, various studies were found to increase sensory awareness in design education. In her method named "Sinking maps", Giampa (2012) directed students to use their senses actively and to create visual metaphors using their senses. Onur and Zorlu (2018: 89) organized multi-sensory awareness training workshops to increase awareness of the senses and draw attention to the relationship between the senses and design education. Kartal (2020: 35) used a method called "sensewalking" in defining the public space through sensory perception. Ayna and Domaniçli (2011: 4) organized a workshop to examine the space with its sensory dimensions and to reflect on the relationship that the body establishes with space through the senses.

With this study, first of all, students were asked to realize space as a phenomenological whole, to realize the space with the senses remaining in the background of spatial reality, then to represent their spatial experiences and to use their ideas in the design of a city furniture. At the end of the study, they evaluated their experiences through a questionnaire. The aim of the research is to draw attention to the senses other than sight and to present an improvable method proposal that exemplifies the use of sensations in imaginative thinking, idea development and design processes.

Phenomenology of Space

The perception of space from the perspective of sensory experience is an issue that came to the fore with the phenomenological approach that emerged at the beginning of the 20th century; indeed, after the 1980s, studies emphasizing the dynamic, holistic, mutual and intersensory dimensions of interaction with the world increased (Degen & Rose, 2012). Phenomenology literally means "the science of the phenomenon (logos)"; the phenomenon is what appears as it appears, or rather means "as it appears in all appearances". In the phenomenological sense, the world expresses relations or references between things; accordingly, the world is a context of references. We find ourselves in this context; we do not extract this context, but we give it its meaning (Lewis & Staehler, 2020). In his book called Phenomenology of Perception, which is a source on the subject, Merleau-Ponty has put forward arguments in which he examines the existence of human beings. The philosopher has sought to discover the true nature of our relationship with objects, with other people, and with the whole world, which depend on our perceptual experiences. Since perception enables the human being to access the world, then, as the author states, the world consists of "what we perceive" (Merleau-Ponty, 2012). Although there are many researches and opinions on phenomenology, the transfer of philosophy to architecture as a theoretical way has been realized with the important contributions of architectural theorists such as Christian Norberg-Schultz, Juhani Pallasmaa, Alberto Perez-Gomez and Kenneth Frampton (Armağan, 2011: 45).

The phenomenological approach which focuses on human experience deals with the subject-object relationship in a semantic, relative, and experiential context, and places with an understanding in which bodily movement and sensation come to the fore. With this perspective, as Pallasmaa (2019), who classifies space as physical and existential, indicates, existential space is shaped by the meaning and values of individuals or societies. With a similar perspective, Schulz focused on the concept of "experience" and described the transformation of "space" into "place" referring to the existential phenomenology approach of Heidegger. He associated the meaningful becoming of "place" with the concept of "genius loci", which is an old Roman term. He described space loaded with emotional meanings, which he defined as "place", as a concrete phenomenon in which light, colour, texture, shape and material integrate (Norberg-Schulz, 1971). According to Simon Unwin (2009), the

concept of "place" in architecture is equivalent to "meaning" in language. Phenomenological theorists rely on the reality of the senses and body in perception. Based on this approach, experience is knowledge itself (Merleau-Ponty, 2017).

Senses and Perception

As tools that enable us to perceive the stimuli of the outside world and establish the connection with the world and reality, senses are the information transmitted to the brain through organs that are the receptors of the body. Perception, on the other hand, can be defined as the process of obtaining information about the environment and giving meaning to objects and events by organizing and interpreting sensory data (Lang, 1987; Rapoport, 1987). Contrary to the classical understanding that categorizes the senses as five systems, most researchers today agree that the process of obtaining information includes more than the five basic senses such as sight, hearing, touch, smell and taste. For example, Steiner stated that we actually use at least 12 senses, listing them as touch, life, movement, balance, taste, smell, sight, hearing, temperature, speech (language), thinking and sense of self (Soesman, 1998). Although the dominant role of vision in perception processes is known, it has also been emphasized by many researchers that the senses do not operate separately, but as parts of a holistic experience, and that perception is not based on partial data from the senses, but on the structuring of the holistic relations between them with cognitive processes.

As the knowledge on the senses and perception increases, it is understood that our awareness of ourselves and the world is multidimensional, and that this awareness process emerges as a result of multi-sensory experiences. Experience is the interaction that takes place between a living person and his environment. Multi-sensory perception is a state of conscious awareness; in fact, it occurs through the interaction and cooperation of the sensory organs with the nervous system, body, emotion, mind, memory, consciousness and the subconscious. Based on the findings of the Gestalt psychology theory, Schneiders defined perception as the process of organizing an object, situation or event that is immediately presented to the consciousness of the individual into a meaningful whole. In other words, the individual perceives any object, situation or event that is a part of his life by transforming it from the partial data transmitted by the sensory organs into a holistic, structural meaning (Seylan, 2020: 69).

Our body is both an object among objects and also sees and touches them. Putting bodily existence at the center of his philosophy, Ponty emphasized that there is an osmotic relationship between the self and the world, that they penetrate each other, complement each other in addition to indicating simultaneity and interaction of the senses (Pallasma, quoting from Merleau-Ponty, 2019). Jeremy Till (1996) described architecture as the colors you hear with your ears, the sounds you see with your eyes, the spaces you touch with your palms, the taste of the space on your tongue, the fragrance of the dimensions, and the sap of the stone. Besides, he depicted that all the senses play important roles in architecture. Steven Holl, on the other hand, defined the body as the place of reference, memory, imagination and integration and stated, "The body is the phenomenal body inhabiting space and time". The role of body and movement in the perception of space is also emphasized by Holl's concept of 'parallax'. Parallax is fluid-spatialism redefined on the basis of dynamic perceptions of the moving body. Considering the existence of the body and the spatial perceptions of the moving body, space reaches a fourth dimension depending on its fluidity (Holl, 2000).

Being surrounded by rich content, experience and sensations provides the brain with many sources to play with, which gives it originality in relating data. Hegarthy (2014: 54) states, "In order to be a successful creator, we must admire the world around us and its oddities and perplexities. The world is a constant source of inspiration, but we must absorb it with all our senses before we can hope to channel it into fresh ideas." Past experiences, old information, memories, thoughts, beliefs, and emotions all play an important role at this point. Sensory data from the environment and old information are fused and are constantly being reconstructed in the brain. Leski (2017) mentions, all ideas arise from a constant connection with the world of the senses because thinking, seeing and all the senses are connected. Ittelson (1973) emphasized that sensations are perceived and internalized more accurately with the senses that play an active role in perception. Regarding the integral role of the senses in perception, Bachelard (1969) used the metaphor of "polyphony", according to which the eye cooperates with the body and other senses. Each sensory value contains a different feature of the object to be perceived in itself (Pallasma, 2019). Dewey defined this unity of experience as "aesthetic experience" (All

senses are equally on the qui vive). Aesthetic experiences gained through the senses affect all rational areas and all behaviors related to them, forming the basis of human consciousness, imagination, intelligence, and judgment (Dewey, 2005: 43). These views which overlap with the sensuous philosophy approach show that a rich image repertoire, experience and sensory accumulation have positive effects on thinking and therefore creativity.

The Experience Factor in Learning

The positive role of experiential knowledge on learning processes in education is a phenomenon that stands out with the influence of phenomenological approach. Experience began to be included in design education programs in the 1970's with Knowles' attention to experience as an important part of defining adult learning, with Dewey's extensive writings underlining the importance of experience in education and with other relevant studies (Knowles, 1978; Dewey, 1938). In experiential learning, information is not transferred directly to the student, it is essential for the student to reach the information through his/her experiences and thus internalize it. Experiential learning has been defined by the Association of Experiential Education as "the process by which a student builds knowledge, skills and values directly from experience" (Clemons, 2006). This model in which the learner can be in direct contact with the targeted reality in applied learning environments such as workshops and field projects aims the individual to learn through experiences (Keeton, 1978). In experiential learning, the individual reaches knowledge through his own reality, exploration and experimentation, not by hearing and reading from the experiences of others; in this way, s/he tends to establish new relationships and syntheses through reflection while thinking about what s/he has acquired in the past. At this point, reflection theory is accepted by educators as one of the basic components of improving student learning (Schön, 1992).

The reflection theory, which is based on the work of Dewey (1910; 1916), is based on the constructivist perspective of human perception; accordingly, the designer builds his/her worldview and reflects it on his/her designs based on his/her experiences, beliefs and knowledge gained in the past. Based on the studies of Kolb and Jarvis, who have works on the subject, Hye-Su Kuk researched the effects of previous learning and reflection on adult learning in experiential learning. She interpreted people's past experiences as a source and "reflection" as a mediator between experience and learning. Accordingly, in Donald Schön's words, students develop their "reflection-in-action" skills; reflection plays a key role in the transition to learned experience (Schön, 1992). According to Hye-Su Kuk, "reflection" and "experience" should not be seen as different actions. Although every experience is not learning, every learning is a reflection and an experience in itself (Kuk & Holst, 2018). In fact, reflective learning and experiential learning are complementary concepts. Reflection plays a mediating role between experience and learning. Reflective learning means to gain experience after an experiential learning cycle (Kolb, 1984). Within this perspective, Dewey defined learning as coming face to face with reality, questioning, and expressing oneself. Similarly, Kolb (1984) and Piaget (1972) also stated that knowledge is gained as a result of the experiences carried from the environment and the ways of applying theoretical knowledge to practice, and that opportunities should be created for the student to make inventions and discoveries in education. The creative mind that can establish a network of relationships learns more easily.

While experiential knowledge increases the awareness and aesthetic sensitivity of designer candidates, it also contributes to creative thinking. Intuitive comprehension and relational-critical thinking skills of individuals who gain sensory awareness increase, and with this process, individuals experience a leap in perception (Hardin, 1994). These individuals gain unique ways of seeing and thinking; moreover, awareness emerges in them as a holistic attitude that includes intuitive understanding and critical thinking skills as a new way of seeing (Aydınlı, 2015: 14). In addition, it is seen that attention, creativity, concentration and emotional intelligence increase with awareness (Broderick, 1998). According to Hegarty (2014), who defines creativity as a process related to inputs rather than outputs, the basis of the phenomenon is how matter is perceived. In fact, every place is full of sources of inspiration. Everything that is experienced, seen, heard, touched, felt, tasted, smelled can help develop new ideas without being aware of it. As Brown & Farrelly (2012: 68) indicated, "designers can develop and control physical and psychological experiences to some extent by considering, for example, the feel of a door knob, its temperature or the weight of a door, the rhythm and speed of a space, i.e. the texture that affect the hands or the feet".

The Relationship of Representation and Perception

Representation can be defined as a physical or mental structure that represents another physical or mental structure (Linsey et al., 2008). Different techniques, forms and environments are used for certain purposes for representations which are also referred to as "external representations" (Baaki & Luo, 2017) or "design representations" (Huybrechts et al., 2012) in the literature. These representations which are prepared with traditional writing, drawing and production techniques or at different levels of abstraction in the computer environment are predominantly visual such as draft and technical drawing, model and prototype construction, concept mapping, video, photography, collage and computer modeling; in addition, they include verbal techniques such as freelance writing or mind mapping.

Design is representation and there is no non-representational design; hence, it is important for design students to become competent in different types of symbolic representations (Eastman, 2001). The ability to transfer thoughts to a different environment with techniques such as music, dance, poetry, language of cinema, photography, illustration, video, model, and installation is important for the development of creative thinking (Aydınlı et al., 2005). Schön (1985) explained that the most basic feature that distinguishes and customizes design education from other disciplines is that it is based on learning processes such as sketches and models. Such methods are interactive actions that allow the expression of images in the mind and the production of new images. It seems important to include practices that will help students improve their sensory awareness and representation skills in education programs, especially in today's world where the sense of sight becomes dominant by overtaking other senses.

With representation systems, images are coded through signs. Thus, they become concrete by being transformed into information-containing expressions and it is possible to convey ideas in this way. Ferdinand de Saussure defined graphic and linguistic systems as ways of expressing and giving form to an idea in the mind (Medway, 1994). According to Paivio, who states that the mind thinks with verbal and visual image codes, representations in one system can activate those in the other system. For example, pictures can be named and images can be associated with words (Atakan, 2014: 34). In addition, it is a question mark whether representation systems are used efficiently among students. Previous studies on the subject show that students are more likely to use visual representations (Goncalves et al., 2014). Images are the most frequently used representation method for designers to generate ideas (Jansson & Smith, 1991; Özçam, 2022).

Another important feature of representations is that they are reflective tools that establish communication with oneself, enabling them to question content and form both in the early and later stages of the design process (Schön, 1985). These internal dialogues facilitate the clarification of ideas, the discovery of deficiencies, and thoughts about situations, conditions, and solutions. Steven Holl, for example, draws a series of watercolor perspectives that aim to present the changing spatial experiences of the subject moving in space before determining the plan in his architectural works. With this reverse design strategy which is parallel to the concept of 'parallax' he proposes, he first creates three-dimensional architectural space representations and then two-dimensional plans. While investigating various spatial perceptions, he aims to reach the image formed in his mind; in other words, he tries to reach the architectural image through imaginative perceptual experiences (Holl, 2000) (Figure 1).
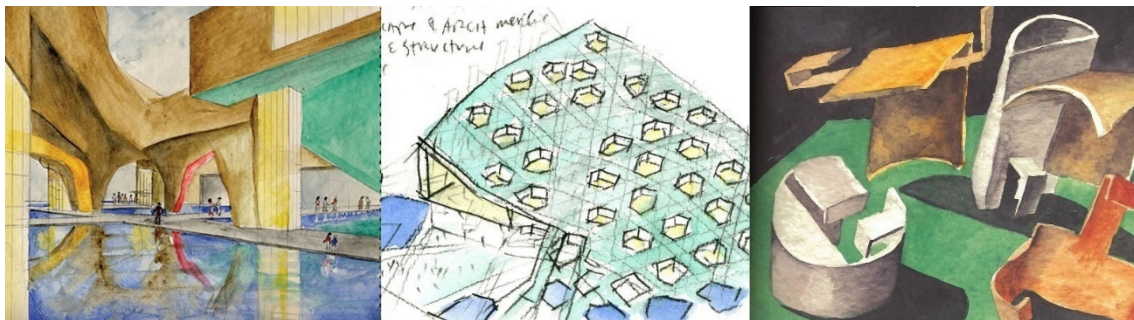

Figure 1. Watercolour sketches by Steven Holl

Regarding the perception and representation relationship, Hall (2000) interpreted 'Space is only perceived when a subject describes it' whereas Fish and Scrivener (1990) stated that thinking with external representations increases the capacity of the mind. Stables (2008) asserted that the mind processes images through external representations. The fact that representations are a conversation with oneself in design is a frequently mentioned function in cognitive and perceptual design theories and has been the subject of many studies to increase creativity (Goncalves et al., 2014; Huybrechts et al., 2012; McVey, 2008; Wang, 2012; Welch et al., 2000).

METHOD, PURPOSE AND WORKSHOP STAGES

The workshop which was organized in order to eliminate the deficiencies created by the eye-centered structure of design education in the perception and representation processes and to enable students to use their sensory awareness in the design process, was carried out in the 2018-2019 academic year with students between the ages of 20-25, studying in the undergraduate program of Mimar Sinan Fine Arts University, Department of Interior Architecture. The study was conducted with a total of 29 students, 69% (n=20) of which were female and 31% (n=9) of which were male. Experiential learning theory and Schön's reflection model were used to create a theoretical framework in the study which deals with the relationships established with different senses through observation, analysis and design processes. In this context, within the scope of the research which is based on the processes of experiencing and representing/reflecting the spaces chosen by the students, firstly, two student projects that exemplify the process were included. Then, the data obtained through the questionnaire were evaluated and answers were sought for the following questions:

- Which of their senses were the students mainly influenced by while doing their representation work?
- How did the representation processes progress?
- Which elements of the space have the students been heavily influenced by in their representation studies?
- How did the relations between perception and representation processes progress?
- What were the effects of these processes on the design phase?

At the beginning of the five-day-long "Sensory Reading and Design" workshop, the students were informed theoretically about the senses and perception, and they had detailed information about the project steps. On the first day, the students were asked to go to the places they chose, spend time there, and collect sensory information during this time. The functional and aesthetic features of the building were considered together with whether it is simple or complex; whether it refers to the past or to a certain culture, place, or period; whether it has a symbolic meaning; whether it is related to its surroundings or disconnected; its temperature, human movements, material properties and what it feels like to be inside. Photographs of the architectural structure and its surroundings were taken; sketches reflecting the atmosphere were made; traces of materials and textures were collected; and notes were taken.

On the second day of the workshop, students were asked to do verbal, visual (concept sheet, sculpture, assemblage, etc.), auditory (music, noise, etc.) or tactile (for example, with a material/texture) identification studies about their sensations and to generate ideas based on their genius loci of the places they visited. How motion can be represented, how the nearest and farthest sounds are perceived, how the transitivity and stratification of vision, hearing, perception can be reflected are considered in addition to the use of data such as form, color-tone, light-shadow, sound, echo, temperature, texture-material, movement-direction, dimensions, depth, transparency, and reflectivity in representation processes. It is expected that this conceptual infrastructure which will be used in the design phase will be a subjective and abstract interpretation of the space. The dimension of representing the ideas is important at the point of forming the main idea that will form the basis of the design. At this stage, the students are asked not to include a form or line about design in their representations. In this way, students had the chance to focus on definitions that directly reflect their senses, and made studies that represent their personal responses to the site.

On the third day of the workshop, students were asked to design a piece of city furniture based on the inspirations drawn from personal experiences, essences, engagements and memories of place. They determined

the functional, symbolic and aesthetic function levels of this furniture. On the last day of the workshop, students made presentations explaining their representation studies and projects. The form, material, color, structure and production details of the designs were discussed in the classroom environment. At the end of the presentations, students were asked to evaluate the workshop process through a questionnaire.

Two Student Works That Exemplify the Study Phase

In this section, two student projects that exemplify the study are presented. The first project with the representation and design visuals in Figure 2 is the Paşalimanı Flour Factory, which is estimated to have been built between 1863 and 1869 and was registered as a 1st degree old work in 1973. It is located in the Üsküdar district of Istanbul. This structure of industrial heritage with a neoclassical façade was described by the student as "a document that carries the production technologies and a historical process that it witnessed until the present day with its layers and that contains unlimited sensory diversity". In addition, the student conveyed her experience of space with these words:

> *When I entered the idle building, the permeability of the structure made me feel the need to reaffirm its boundaries. The natural and artificial traces in its texture appeared before me as the elements that made the secret of its history mysterious. Even though the material was stone, I felt as bare inside the building as being behind a glass.*

Doing a representation that included verbal and visual elements based on her experience, the student reflected the silhouettes in her image, her impressions, and her feelings. With the texture samples she collected from the field, she made a work that has not only a visual but also a tactile aspect by sticking sand and soil pieces on the sheet. Besides, she expressed her thoughts with the words "Whoever discovers this secret leaves a permanent work to the world". The concept setup which deals with different traces and intersections related to space and time is reflected in the design with the logic of vertically placed layers; indeed, the emphasis of nudity is intended to be given with transparent plexiglass material. Layers lined up one after the other and bearing the traces of the historical structure on them offer different perspectives from various angles. Seeing the back of the structure with the vertical angle of the plates has been associated with concepts such as transparency, existence-extinction, permanence-temporality, and past-present. No sitting function is planned on the sculptural structure where dynamic identity constructs can be created with alternative projection images; however, people can sit on the platform where the statue is located, highlighted by the hidden lighting. In this respect, it can be said that the study prioritizes symbolic and aesthetic functions.
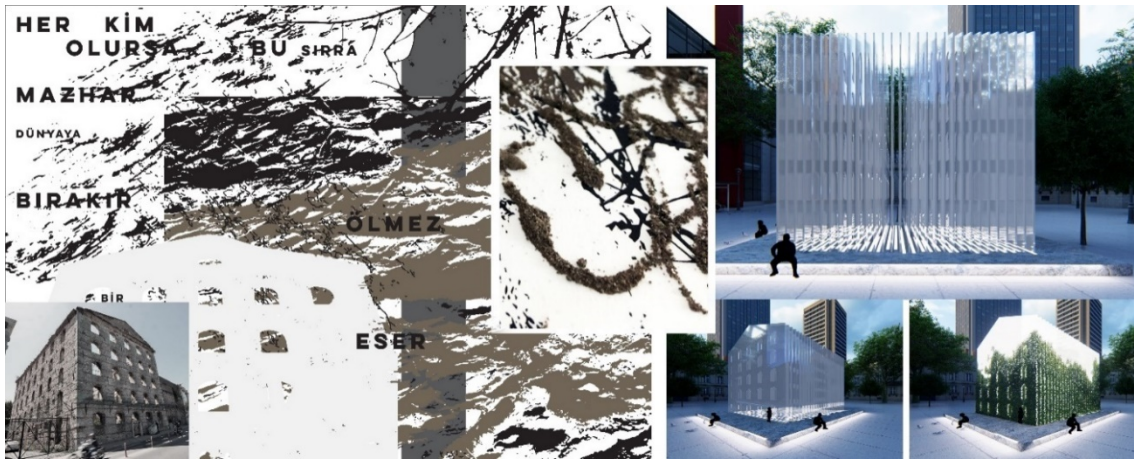

Figure 2. Representation and design studies for Paşalimanı Flour Factory

The second project which exemplifies the working process is the Panayia Avangelistria Greek Orthodox Church in İstanbul Dolapdere, whose construction was dated back to 1893 and which was declared a 2nd degree urban site in 1979. The structure which is based on its relations with the region it is located at in the sensory reading and representation processes was defined by the student with the words 'while reflecting the traces of history, it adapted to its environment over time and created a harmonious contrast'. Symbolic elements reflecting the relations with faith, visuals related to the surrounding chaos and geometric lines

referring to the architectural structure were used in the representation map of the building which stands out with its monumental features surrounded by chaos and the flea market located nearby. Parallel to this, symbolic features came to the fore again during the design phase, and the concepts of centrality, containment, and contrast were emphasized. In the design, stability and timelessness are emphasized with the red seat in the middle, and the dynamism of life is emphasized with the wooden structure surrounding the seat. Emphasizing the impact of architecture on the environment and the echo of life on architecture with a sculptural structure and making a model of his work, the student named his design 'echo' in connection with these thoughts (Figure 3).

Figure 3. Visual representation and design studies for Panayia Avangelistria Greek Orthodox Church

### Collection and Analysis of Quantitative Data

In the survey conducted at the end of the study, the students were asked to evaluate the senses that they realized to give priority while experiencing the places they chose and then to evaluate the components of the space that stood out in their representation work. In addition, some questions were asked about the efficiency of the study. It was assumed that the intervals were equal, and the score interval was calculated as 0.80 for the arithmetic means (Score Interval= (Highest Value-Lowest Value)/5= (5-4)/5=4/5=0.80). All the information analyzed in the study was obtained from the survey data. The NCSS (Number Cruncher Statistical System) program was used for statistical analysis. Descriptive statistical methods (mean, standard deviation, median, frequency, percentage, minimum, maximum) were used while evaluating the study data. The conformity of the quantitative data to the normal distribution was tested with the Shapiro-Wilk test and graphical examinations. Spearman correlation analysis was used to evaluate the relationships between quantitative variables, and statistical significance was accepted as $p<0.05$.

Data Analysis Results

In this section, the results of the data analysis are presented. Primarily, students were asked to evaluate which senses they used predominantly in their spatial experience, and which components of the space they primarily focused on in the sensory reading study. Then, they were asked to evaluate sensory reading, representation and design processes in terms of efficiency. As a consequence, the resulting data were analyzed with Spearman correlation and frequency analysis. When the predominant senses while perceiving the space are examined; the first priority is observed to be vision (Mean±Sd =4.69±0.66); the second priority is observed to be hearing (Mean±Sd = 3.60±1.52), the third is the sense of touch (Mean±Sd =3.52±1.38) and the last is the sense of smell (Mean±Sd =2.07±1.21) (Table 1). When the sensory representation studies are examined, it was seen that the first priority is taking photographs; the second priority is making collages; the third priority is collecting material/texture examples; the fourth priority is making hand sketches; the fifth priority is finding a music that represents the thoughts; the sixth priority is making models; the seventh priority is computer modeling; the eighth priority is finding ready-made images from the internet; the ninth priority is preparing videos; and the last priority is making assemblages.

Table 1. Distribution of primary senses in space perception
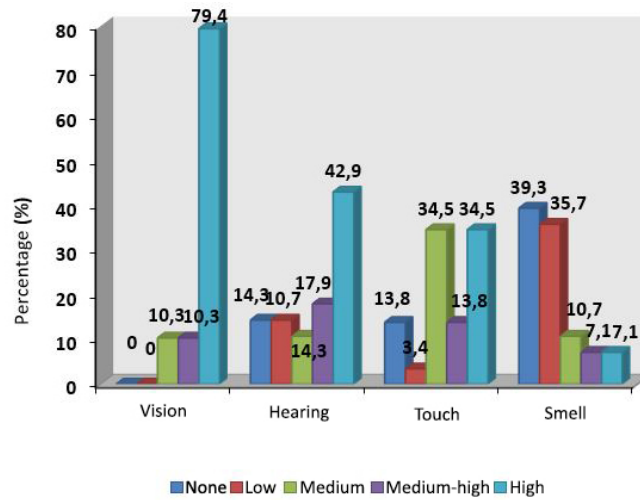
When the spatial elements that come to the fore in the emotional representation study are examined; the first priority was form-line, the second priority was motion-direction, the third priority was texture-material, the fourth priority was sound, the fifth priority was color-tone, the sixth priority was light-shadow, the seventh priority was ratio-proportion, and the last priority was heat factor (Table 2).

Table 2. Distribution of the components of space in sensory representation work
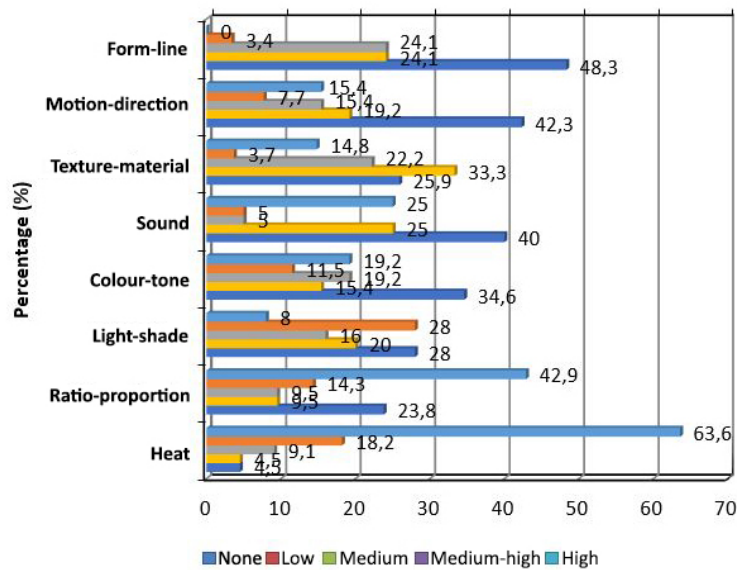
In the sensory representation study, the students were asked to evaluate the steps in the process, and the most productive process was "transferring the concepts accessed via the sensory representation study to the design". Then came the processes of "transferring the data obtained from the observed space with sensory representation work", and finally "transferring the data obtained from the space verbally" (Table 3).

Table 3. Efficiency analysis of periods in sensory representation study

	None	Low	Medium	Medium High	High	
	n (%)	n (%)	n (%)	n (%)	n (%)	Av±Ss
Ability to transfer data obtained from observed space verbally	0 (0,0)	1 (3,7)	12 (44,4)	6 (22,2)	8 (29,6)	3,78±0,93

Ability to transfer data obtained from observed space via sensory representation	0 (0,0)	0 (0,0)	4 (21,1)	9 (47,4)	6 (31,6)	4,11±0,74
Ability to transfer concepts accessed in sensory representation work to design	0 (0,0)	0 (0,0)	6 (23,1)	9 (34,6)	11 (42,3)	4,19±0,80

When the relations between the levels of data transformation were evaluated, a moderate correlation with a positive direction of 0.520 was found to be statistically significant between the levels of transferring the sensory representation study and transferring the concepts to the design (r=0.520; p=0.033; p<0.05) (Table 4).

Table 4. Analysis of relations among the periods

Sense used in space perception		Level of verbal transmission	Transmission through sensory representation study
Ability to transfer via sensory representation study	n	17	
	r	0,255	
	p	0,324	
Ability to transfer accessed concepts to design	n	24	17
	r	0,113	0,520
	p	0,599	0,033*

r=Spearman's Corelation Coefficient   *p<0,05

DISCUSSION

In this section, it is aimed to examine the prominent factors in students' perception of space, and the survey results regarding the workshop process are presented. It has been observed that students focus on their senses of sight and hearing during the stage of experiencing the space; indeed, the fact that focusing on different senses in the space has not changed the role of seeing, which is the primary sense. This situation has been a problematic dilemma that they faced during the discussion and mental studies that took place during the workshop process. Besides, the results are in line with previous research findings that seeing is the primary sense in perception and representation (Goncalves et al., 2014, Jansson & Smith, 1991, Ayna & Domaniçli, 2011). Another finding is that design students mostly prefer to be limited to visual representation in the order they are used to, and do not tend to tactile, verbal, auditory or other types of representations. These results show that it would be beneficial to include more studies with senses other than vision and with different representation systems in design education.

In the representation works of the students, the primary data regarding the spatial experiences were form and line, which were followed by motion and direction in space. This result shows that dynamic components such as movement and direction are also elements that can be studied in representation and reflection studies. When the students were asked to evaluate the steps in the process within the scope of the study, it was seen that the most efficient step was "transferring the concepts reached in the sensory representation study to the design". It is thought that the representation studies carried out at the point of transferring the concept to the design are effective. Again, the positive moderate relationship between the levels of "transferring through sensory representation work" and "transferring concepts to design", which are among the research findings, also confirms this situation. As a result of the verbal evaluations of the students whose perspectives on the senses have changed, it has been determined that all this sensory awareness is a powerful source of inspiration for the design process. It is thought that the workshop process has allowed students to internalize the design not only visually, but also multisensually, with their sensory awareness.

In studies such as these which are based on process-oriented design pedagogy, inter-process relations are "findings" rather than results. Each attempt is tested and actively experienced in the cyclical stages of previous experience, thought, and reflection (Yorgancıoğlu & Seyman Güray, 2018). There is a new production at every step and each production can open new windows. For this reason, it is important that the design process itself offers a learning environment rather than making a one-dimensional evaluation of the outputs of the method

used in the study. Rather than producing a solution to an existing problem, the aim of the workshop is for the students to experience, in Donald Schön's (1992) words, "to have a reflective communication with the material presented by a certain situation". Experienced representation and design steps trigger conceptual and relational thinking styles and appear as repetitive, dialogical, creative and critical as well as transformative processes in which the student is actively engaged in the process. When these dimensions are examined, the steps, themes and outputs of the workshop's achievements can be summarized in Table 5.

Table 5. Stages, content and gains during the project

	Content	Gains
Space experience	- Observing senses and perceptions - Experiencing the environmental, cultural and temporal characteristics of the space - Focusing on internal processes	- Gaining awareness of different senses - Developing aesthetic sensitivity - Developing concentration
Representation stage	- Recording and transferring experience gained as a result of observation - Being able to make definitions and reflecting them - Creating the conceptual infrastructure - Establishing relationships among different representations	- Conceptual and relational thinking - Ability to express and demonstrate the concept in the most effective way - Ability to reflect oneself verbally and visually - Ability to decide among ideas - Ability to ask new questions - Flexible and fluent thinking - Emotional expression
Design stage	- Designing furniture within the framework of representation definitions - Using the data collected as a result of the experience gained in the design process - Thinking about the design method, symbolic, aesthetic and practical functions of design - Establishing the definition-form relationship - Making visualization studies related to design	- Reflecting the concepts on design - Ability to think flexibly - Ability to think in two and three dimensions - Ability to present the design effectively

CONCLUSION

Design education is an interdisciplinary process for gaining cognitive, sensory and psychomotor skills. Capabilities such as originality in perception, interpretation and representation, flexibility, relational, intuitive, imaginative, productive and extraordinary thinking in design are among the features that students want to gain. However, today, with the effect of the eye-centered paradigm, students focus on the visual without internalizing the design with sensory awareness, without comprehending all the realities, phenomenological structure of design and the relationships between all these concepts. While the strong structure of visual images carry design to a single-centered point, this situation carries risks in not realizing the holistic nature of the design, manipulating mental processes and homogenizing communication. For this reason, alternative studies focusing on cognitive awareness, sense and perception gain importance during design education.

In the workshop, which was held with interior architecture students, the participants were asked to do sensory reading exercises in the places they chose and then to represent their sensations and to use this data in the design of a city furniture. During the study, students conceptualized, interpreted and used the data in design by gaining awareness of what they perceived. At the end of the workshop a survey was made; the results showed that vision is the primary sense in perception. In the stage of representation, form and movement elements in spaces were the most effective. The significant relationship between reflection and design phases showed that representation studies have positive effects on design processes. Realization of sensory values other than vision and understanding the unity and polyphony of the senses are values that improve the perception and design skills of the designer candidates. Based on this point of view, it can be said that inclusion

of practices to develop sensory and cognitive awareness in design education is a subject that should be especially emphasized in today's visual world. Supporting the vision-centered structure of design education with studies based on alternative senses, focusing on materials, sounds, textures, movement in unconventional ways, and experiences like hands-on activities can help students develop their understanding, interpretation, vision and thinking styles, and help them turn into individuals with strong sensory awareness, advanced imagination capacities, capable of mental expansions, and sensitive to the environment. Diversifying such studies and making them widespread throughout the training programs can provide more effective results.

Phenomenology approach, emphasizing the importance of human being and their sensations in the perception of space strengthens the human-oriented position of design practice. Candidates who are responsive to the environment, can develop better solutions for the problems in the future.

Authors' Contributions

There is a single author in this paper who contributed 100%.

Competing Interests

There is no potential conflict of interest.

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Figure References

Figure 1: Keskeys, P. (2005). How Steven Holl uses watercolor paintings to create amazing architecture. *Architizer.* https://architizer.com/blog/practice/tools/how-architecture-is-born-steven-holl-2 (18.03.2022).